SAN PASQUAL BAND OF MISSION INDIANS

COMMUNITY SEWER SYSTEM

ENVIRONMENTAL ASSESSMENT

Prepared For:

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SAN PASQUAL BAND OF MISSION INDIANS

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1.0 INTRODUCTION AND BACKGROUND INFORMATION

1.1 Program Authority – Action Being Requested of Indian Health Service

This Environmental Assessment (EA) has been prepared for the U.S. Department of Health and Human Services (DHHS), Indian Health Service (IHS) to document the environmental review of proposed improvements to the existing wastewater system of the San Pasqual Band of Mission Indians (Band). IHS proposes to fund the Proposed Action under the Sanitation Facilities Construction (SFC) program. IHS, as Lead Agency, will use this EA to determine if improvements to the Tribe's wastewater system would result in significant effects on the quality of the human environment.

1.2 Goal To Be Accomplished

The Band is proposing the construction of new wastewater and recycled water facilities. These new facilities include sewer gravity pipelines, lift stations, force mains and a wastewater treatment plant (WWTP) as well as a recycled water conveyance system (Proposed Project). These facilities would replace the existing individual septic system infrastructure throughout 5,450 acres of three districts (Districts A, B, and C) of the Band's Reservation area, inclusive of a 325-acre portion of land northwest of District B for expected future development. See ***Figure 1.1: Regional Vicinity*** and ***Figure 1.2: District Map***.

Sewer infrastructure within the Band Reservation Area districts and trust and fee area would be constructed throughout 5,450 acres of the Band's Reservation area (See ***Figure 1.3: Plan Overview***). Each district would include the following improvements:

District A:

- Wastewater Treatment Plant
- Gravity pipelines
- Lift stations
- Force mains

District B:

- Gravity pipelines
- Lift stations
- Force mains

District C:

- Gravity pipelines
- Lift stations
- Force mains

Trust and Fee Land:

- Gravity pipelines
- Lift stations
- Force mains

A portion of the Proposed Action area also exists within a Special Flood Hazard Area (SFHA) as designated by the Federal Emergency Management Agency (FEMA).

This EA has been prepared pursuant to the requirements of Section 102(2)(c) of the National Environmental Policy Act of 1969 (NEPA), as amended, including the most recent amendments in 2025. The IHS is the lead federal agency to ensure compliance with NEPA for the Proposed Project. This EA follows the guidelines recommended in Indian Health Service Environmental Review Manual and other laws, regulations, and Executive Orders.

The EA includes a discussion of any potential environmental effects which could be generated by the Proposed Project and determines whether or not an Environmental Impact Statement would be required. The EA includes mitigation measures to reduce any potential significant impacts to less than significant.

1.3 Report Objectives of the Proposed Project and IHS's Subsequent Federal Action of Providing Federal Assistance

The National Environmental Policy Act (NEPA) requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. This environmental documentation discloses to decision-makers and the interested public a clear, accurate description of potential environmental effects resulting from proposed federal actions, and reasonable alternatives to those actions. Through NEPA, the U.S. Congress directed federal agencies to integrate environmental factors in their planning and decision-making processes and encourage and facilitate public involvement in decisions that affect the quality of the human environment. Federal agencies are required to consider the environmental effects of a Proposed Project; alternatives to the Proposed Project; and a No Action Alternative (assessing the potential environmental effects of not undertaking the Proposed Project).

This report evaluates the Proposed Project's potential impacts to environmental resources from the standpoint of NEPA and other applicable laws. As such, the objectives of the Proposed Project are to:

1. Improve the overall health conditions of residents of the Band Reservation Area, by modernizing and centralizing the sewer infrastructure to provide for a safe, reliable means of disposal of the wastewater generated as well as minimizing potential environmental impacts due to the end of the effective lifespan of the existing individual septic-based sewage treatment systems.
2. Accommodate a growing population on the Band Reservation Area by providing a community sewer system to convey and treat wastewater through a new WWTP. This sewer infrastructure would provide for increased wastewater treatment capacity, reducing health risks, nuisance odors associated with poorly treated wastewater, and increase the availability of recycled water throughout the Band Reservation Area, further increasing water efficiency during drought conditions experienced in the State. The updated sewer system would accommodate the needs of current and future population growth within the Band Reservation Area.

Proposed Federal Action

The proposed action is the approval of federal funding for the construction of the Tribe's proposed project to construct and use the community wastewater system and WWTP for the Band as well as the abandonment of existing underground wastewater facilities. This EA constitutes adequate environmental analysis by the IHS in support of the Tribe's proposed project, allowing for the IHS's provision of Federal assistance (proposed action).

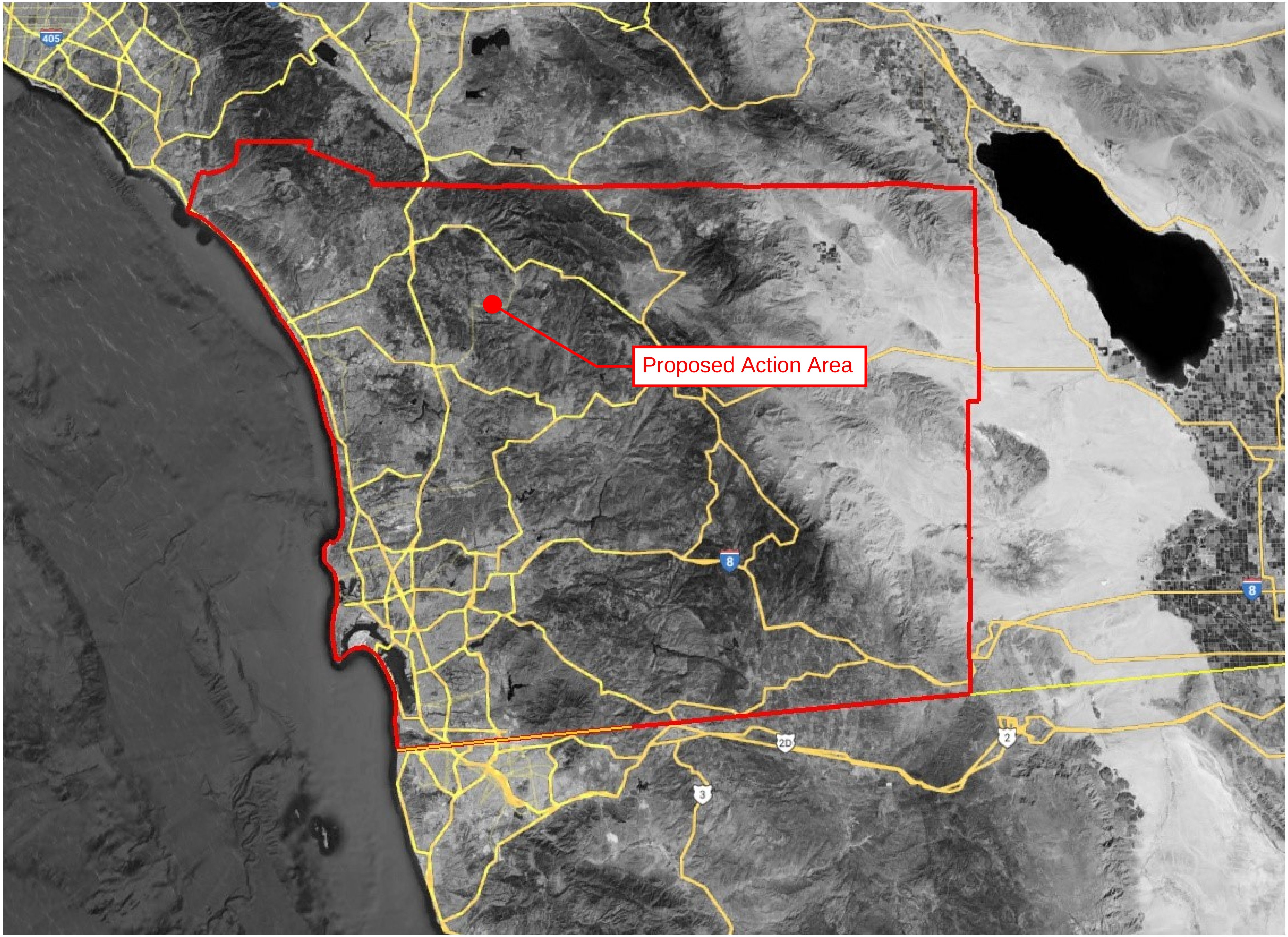

FIGURE 1.1: Regional Vicinity
San Pasqual Community Sewer

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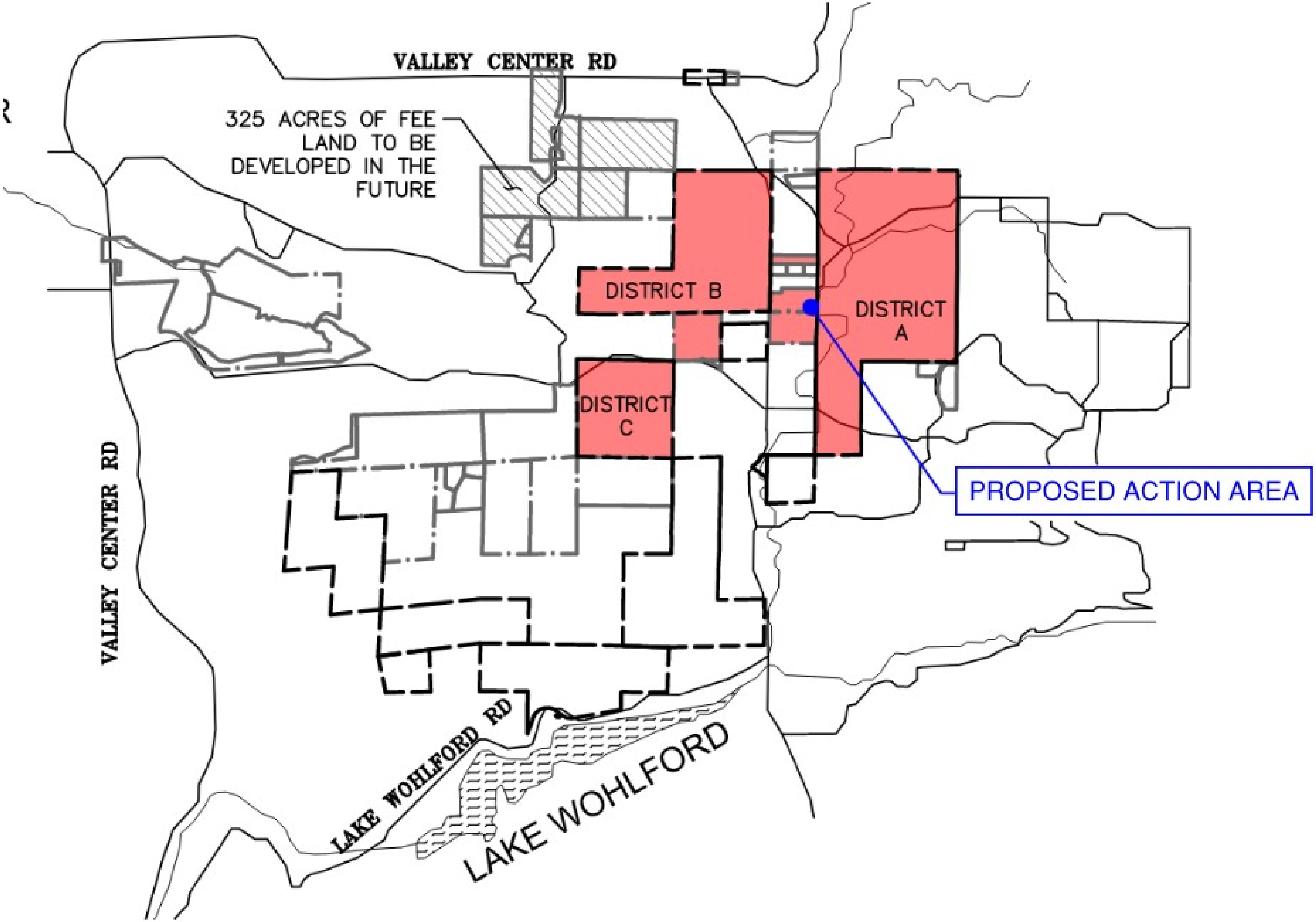

FIGURE 1.2: District Map
San Pasqual Community Sewer

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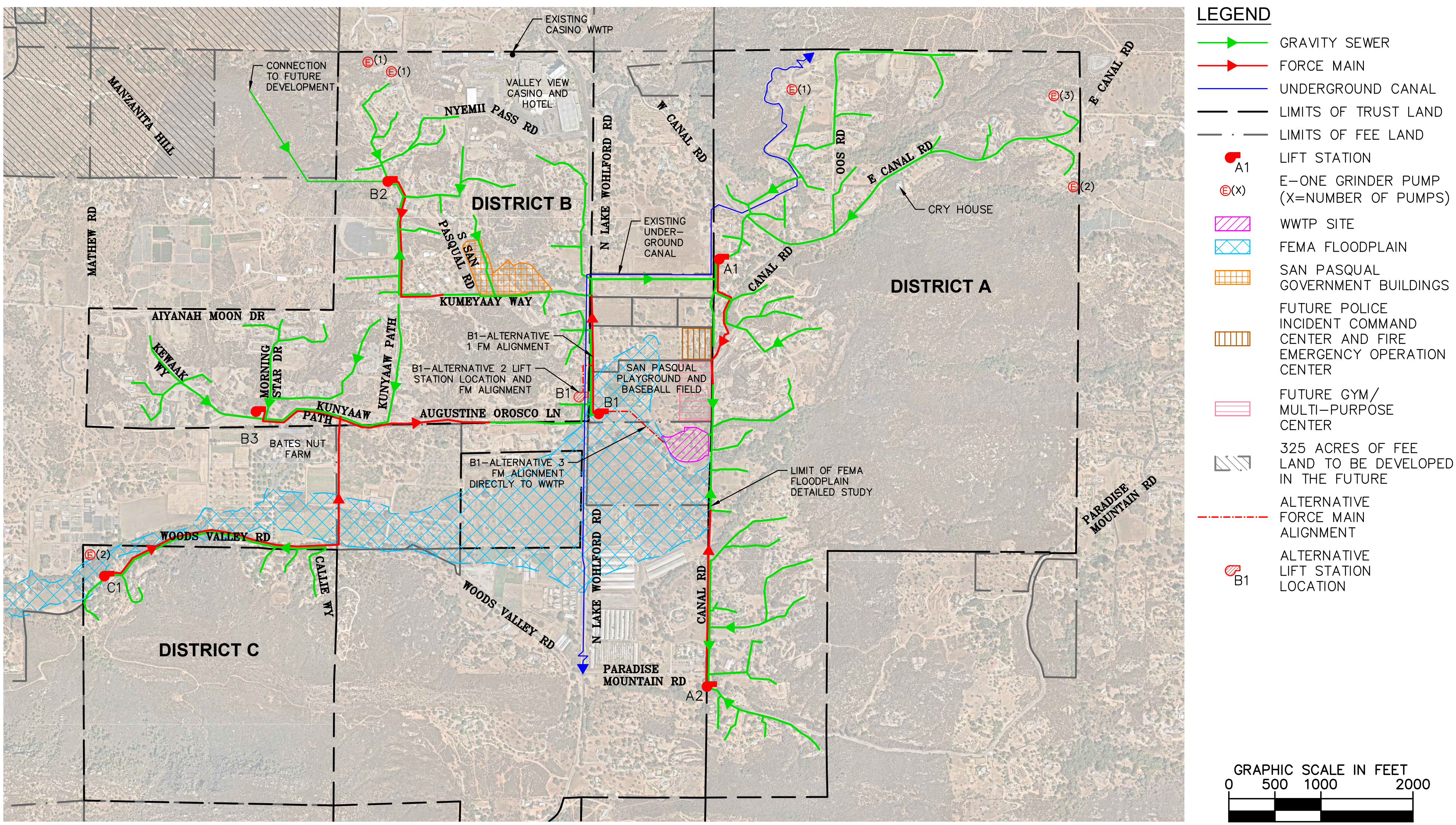

FIGURE 1.3: Plan Overview
San Pasqual Community Sewer

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2.0 PURPOSE AND NEED

An Environmental Assessment (EA) must include a description of the purpose of the Proposed Action(s) under federal review and why it is needed. Identification of the purpose and need for the Proposed Action(s) provides the rationale for the Proposed Action(s) and forms the foundation for identification of reasonable alternatives that meet the purpose of the action, and therefore address the need or problem. In other words, this section identifies the problem being addressed and describes the purposes to be achieved by the Proposed Action and the Band's proposed Project.

2.1 Purposes of the Proposed Action

In conjunction with the IHS, the Band has proposed the use of the Sanitation Facilities Construction Program (SFC) to fund sewer improvements within three districts of the Band Reservation area. This funding would allow for the Band's proposed Project to be implemented throughout a greater area of the Band Reservation Area and within a shortened timetable compared to traditional fundraising.

The main purpose for the Proposed Action is to provide funding to support the modernization and centralization of sewage conveyance and treatment infrastructure within the Band Reservation Area to provide a reliable, consistent means to treat sewage generation within the Band Reservation Area. A secondary purpose of the Proposed Action would be to reduce the hazards associated with the continued use of underground septic tanks, such as failing septic systems due to their reaching the end of effective lifespan, and instead provide more modern, cleaner wastewater treatment.

2.2 Need for the Proposed Action

The proposed Project addresses the need to modernize the infrastructure within the Band Reservation area. Septic systems require periodic maintenance and are susceptible to issues related to overfilling, clogging, and accidental hazardous release. Additionally, the use of septic tanks limits population growth because septic systems require sufficient and suitable land for their disposal areas. Increased flows to septic systems have the potential to overload the disposal area, resulting in surfacing effluent and increasing health risks due to exposure to contaminated water. The Reservation has limited suitable land and a growing population. Converting to a community sewer system will allow for increased housing density. Additionally, septic systems offer limited treatment potential compared to modern wastewater treatment plants. High densities of septic systems have been linked to increased levels of nitrates in groundwater. Finally, septic tanks do not provide the potential for the reuse of treated wastewater and the existing septic treatment systems on the Band Reservation area are reaching the end of their effective lifespans.

The Proposed Action would support the proposed Project in growing population of the Band Reservation area and the increased generation of wastewater. The proposed Project would provide improved wastewater treatment capacity for the Band, reducing health risks and nuisance odors associated with poorly treated wastewater. Additionally, the WWTP would increase the availability of recycled water within the Band Reservation area, further increasing water efficiency during drought conditions experienced in the State.

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3.0 ALTERNATIVES INCLUDING THE PROPOSED PROJECT

This chapter of the Environmental Assessment (EA) includes a discussion of alternatives considered in preparation of the EA. This chapter compares the effects of the Proposed Project(s) and alternatives considered, including the No Project Alternative. In this case, the Proposed Project(s) involves improvements to the San Pasqual Band of Mission Indians (Band) Reservation's sewer infrastructure.

3.1 Description of Proposed Project and No-Project Alternatives

Two alternatives are considered for this project: No Project Alternative (Alternative 1), Proposed Project (Alternative 2). The Proposed Project was chosen as the preferred alternative from an economic, environmental, and functional standpoint and has been found to not result in any significant unavoidable impacts that would warrant an alternative design. The alternatives are compared, as follows, in terms of their potential environmental impact and their ability to achieve the purpose of and need for the Project. In addition to the alternative analysis provided in this section, an analysis of alternatives specifically related to the 8-Step Process and impacts to floodplains is included as **Appendix D** of this EA.

3.1.1 No Project

Under the No Project Alternative (Alternative 1), the Band and residents on the Reservation would continue to utilize existing onsite individual septic-based wastewater systems (septic systems). The continued use of the septic-based sewage treatment systems would require continual maintenance and be susceptible to issues related to overfilling, clogging, and accidental hazardous release. In addition to these, the existing septic systems are nearing the end of their remaining useful lifespan, which would require the Band to plan for the ongoing abandonment and replacement of these systems. This replacement poses a concern if additional land on properties is limited, as the existing systems would be abandoned in place. The use of septic systems limits population growth as the systems do not easily scale to increased development or allow for high density residential construction. The continued use also eliminates the potential for use of recycled water. Land use is limited with septic systems, as developments cannot be constructed where existing septic systems are located. Septic systems offer limited treatment potential compared to modern wastewater treatment plants. According to the characteristics described above for this alternative, Alternative 1 is not the recommended alternative.

3.1.2 Proposed Project (Preferred Alternative)

The Band is proposing the abandonment of the existing decentralized septic-based sewage treatment systems on individual properties and the construction of a community sewer system with a new WWTP. The WWTP is proposed to be a Membrane Bioreactor (MBR) Package type plant. The Proposed Project would include the construction of sewer gravity pipelines, sewer lift stations, and sewer force mains, as well as the construction of the infrastructure to convey and store recycled water. ***Table 3.1: Sewer Facility Improvement Summary*** summarizes the lengths of pipeline to be installed by the Proposed Project.

Table 3.1: Sewer Facility Improvement Summary

Infrastructure Type	Measurement	Size
Sewer Force Mains	Linear Feet	12,840
Gravity Sewer Line	Linear Feet	64,000
Recycled Water Distribution Lines	Linear Feet	5,500
Wastewater Treatment Plant[1]	Acres	8.5

Notes:
1. Area for the entire WWTP site not exclusive to the proposed structure floor area.

The proposed WWTP site would occupy an approximately 8.5-acre portion of land immediately west of District A. The WWTP site would include the following facilities:

- An administrative building;
- A sludge processing facility;
- An MBR wastewater treatment facility;
- Three percolation ponds;
- An emergency storage pond;
- A UV treatment facility;
- An influent pump station;
- A 50,000-gallon recycled water storage tank;
- A recycled water pump station;
- An electrical pad, meter and transformer; and
- A backup generator.

New recycled water lines would also be constructed to connect from the WWTP area to the existing recycled water infrastructure which connects to the western portion of District A. Additionally, a new private roadway would be constructed around the perimeter of proposed WWTP structures. The roadway would be secured with gated entry at the eastern and western entrances. See ***Figure 3.1: Wastewater Treatment Plant Site Layout*** for an overview of proposed structures within the WWTP.

3.1.3 Construction

Construction of the Proposed Project is expected to occur in five phases. See ***Figure 3.2: Phasing Plan*** for an overview of the proposed phase of development for each district.

During construction, actual ground disturbance will be limited to the installation of the access roads, equipment skid pads, the underground sewer, recycled water and electrical facilities, and WWTP structures. Construction would also include the repaving of roadways above sewer facilities installed in existing paved streets. ***Table 3.2: Construction Estimates*** summarizes the estimated earthwork to be completed during construction of the Proposed Project.

Table 3.2: Construction Estimates

Phase #	Facility	Earthwork (CY)		
		Cut	Fill	Net Cut
1	Initial WWTP	0	0	0
	Gravity Pipe	8825	9273	-448
	Sewer Lift Stations	0	0	0
	Sewer Force Mains	617	617	0
	Recycled Water Pipe	2965	2965	0
2	Gravity Pipe	3637	3774	-137
	Sewer Lift Stations	0	0	0
	Sewer Force Mains	724	724	0
3	WWTP Expansion	0	0	0
	Gravity Pipe	6752	7052	-300
	Sewer Lift Stations	0	0	0
	Sewer Force Mains	731	731	0
4	Gravity Pipe	5420	5616	-196
	Sewer Lift Stations	0	0	0
	Sewer Force Mains	1753	1753	0
5	Gravity Pipe	1951	2037	-86
	Sewer Lift Stations	0	0	0
	Sewer Force Mains	1560	1560	0
	Total	**34935**	**36102**	**-1167**

Construction activities would require the transportation of workers and materials. The Proposed Project and is expected to generate approximately 20 worker trips during site preparation activities which would include minor grading/clearing and scraping of the surface to enable the construction of the proposed project. This also would include 70 trips during construction needed for the installation of fencing and foundations, as well as approximately 40, 130-mile round trip haul trips within the air basin.

3.1.4 Operations

A staff of knowledgeable, trained and certified operators and supervisors are required to maintain successful operation of the proposed WWTP. Operations for package Wastewater Treatment Plants can be straightforward for Wastewater Treatment Plant operators, as the manufacturer can provide maintenance and support remotely.

The membrane bioreactor wastewater treatment plant is considered a Class III Wastewater Treatment Plant classification, according to the California Title 23 Division 3 Chapter 26 (Article 2, § 3675). Due to this classification, it is expected that the maintenance staff will be comprised of no less than one (1) Chief Plant Operator with Grade III Certificate, two (2) Shift Supervisors with Grade II Certificate, and two (2) operators with Grade I Certificate or Operator in Training Certificate, operating in shifts.

The Proposed Project (Alternative 2), as described in the EA, includes the construction of new community wastewater treatment system, abandonment of the existing individual septic-based sewage treatment systems. These new wastewater facilities would be constructed throughout 5,450 acres of three districts (Districts A, B, and C) of the Band's Reservation area, inclusive of a 325-acre portion of land northwest of District B (refer to ***Figure 1.1: Regional Vicinity*** and ***Figure 1.2: District Map***).

The project construction is proposed to be completed in five phases, dependent on funding availability. While construction can be completed concurrently, as a conservative approach, the construction of the Proposed Project was estimated to occur over a period of approximately 9.5 years, with each phase of construction consecutively following the previous phase. Phase 1 would occur over approximately 2.5 years. Phase 2 would occur over approximately 1.5 years. Phase 3 would occur over approximately 2 years. Phase 4 would occur over 2 years. Phase 5 would occur over approximately 1.5 years.

Alternative 2 would address the growing population of the Band Reservation Area, along with the resulting increased generation of wastewater, and would provide improved wastewater treatment capacity for the Band, reducing health risks and nuisance odors associated with poorly treated wastewater. Additionally, the WWTP would increase the availability of recycled water within the Band Reservation area, further increasing water efficiency during drought conditions experienced in the State.

3.2 Alternatives Considered but Eliminated from Further Analysis

The following alternatives were considered in the Sewer Feasibility Study prepared by Kimley-Horn dated September 18, 2023, but ultimately were removed from further analysis following the recommendation of the proposed Project.

3.2.1 Alternative 3: Conventional Activated Sludge Wastewater Treatment Plant

This alternative would include the development of a conventional activated sludge Wastewater Treatment Plant process that includes screening, grit removal, primary sedimentation, secondary treatment and disinfection treatment processes. The activated sludge process is a biological treatment process that involves the conversion of organic matter and other constituents in the wastewater to gases and cell tissue by a large mass of aerobic microorganisms maintained in suspension by mixing and aeration. The microorganisms form flocculent particles that are separated from the process effluent in a sedimentation tank and are returned subsequently to the aeration process or wasted. This alternative was eliminated from subsequent analysis since this type of wastewater treatment plant would require a greater amount of maintenance and oversight, higher operational and construction costs, and would be sensitive to variances in volume and effluent composition. Additionally, when compared to MBR systems, effluent created by Alternative 3 would be treated to an inferior quality compared to the proposed Project. As such, potential impacts to groundwater would be greater under this alternative and effluent would require more extensive treatment prior to use as a non-potable water source. Also, compared to the smaller footprint required for MBR systems, this alternative would require greater ground moving activities during construction, increasing the amount of disturbed earth, and increasing the potential to encounter buried resources.

3.2.2 Alternative 4: Sequencing Batch Reactor Wastewater Treatment Plant

This alternative would involve the development of a sequencing batch reactor. This type of reactor would complete all steps of the activated sludge process (including effluent fill, biological reaction, and settling) within the same reactor. This alternative was removed from consideration due to its decreased ability to remove nitrogen and phosphorus from the wastewater and its increased maintenance cost and effort. As with Alternative 3, this alternative would pose greater potential impacts to groundwater quality and recycled water use due to the inferior effluent quality.

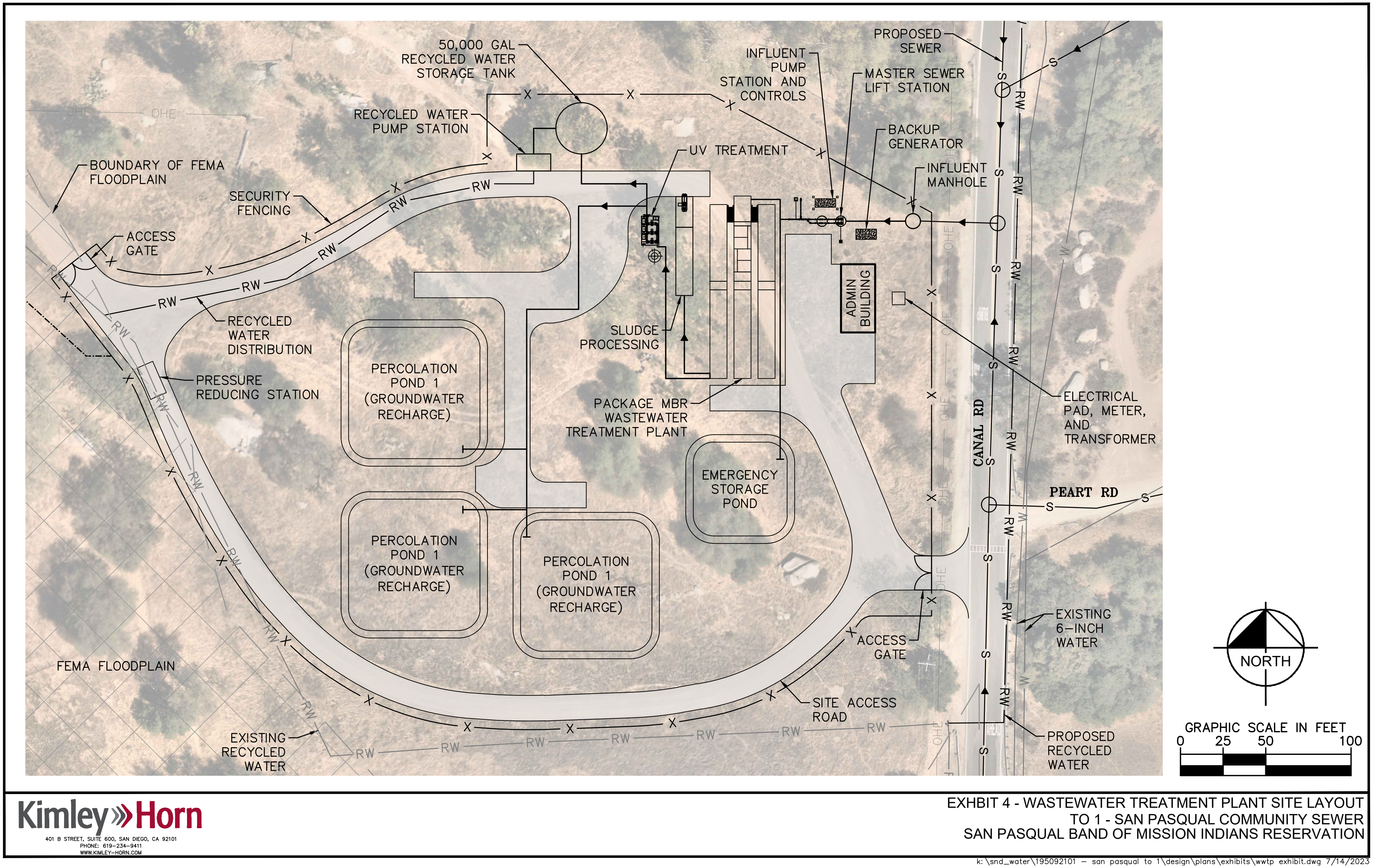

FIGURE 3.1: Wastewater Treatment Plant Site Layout
San Pasqual Community Sewer

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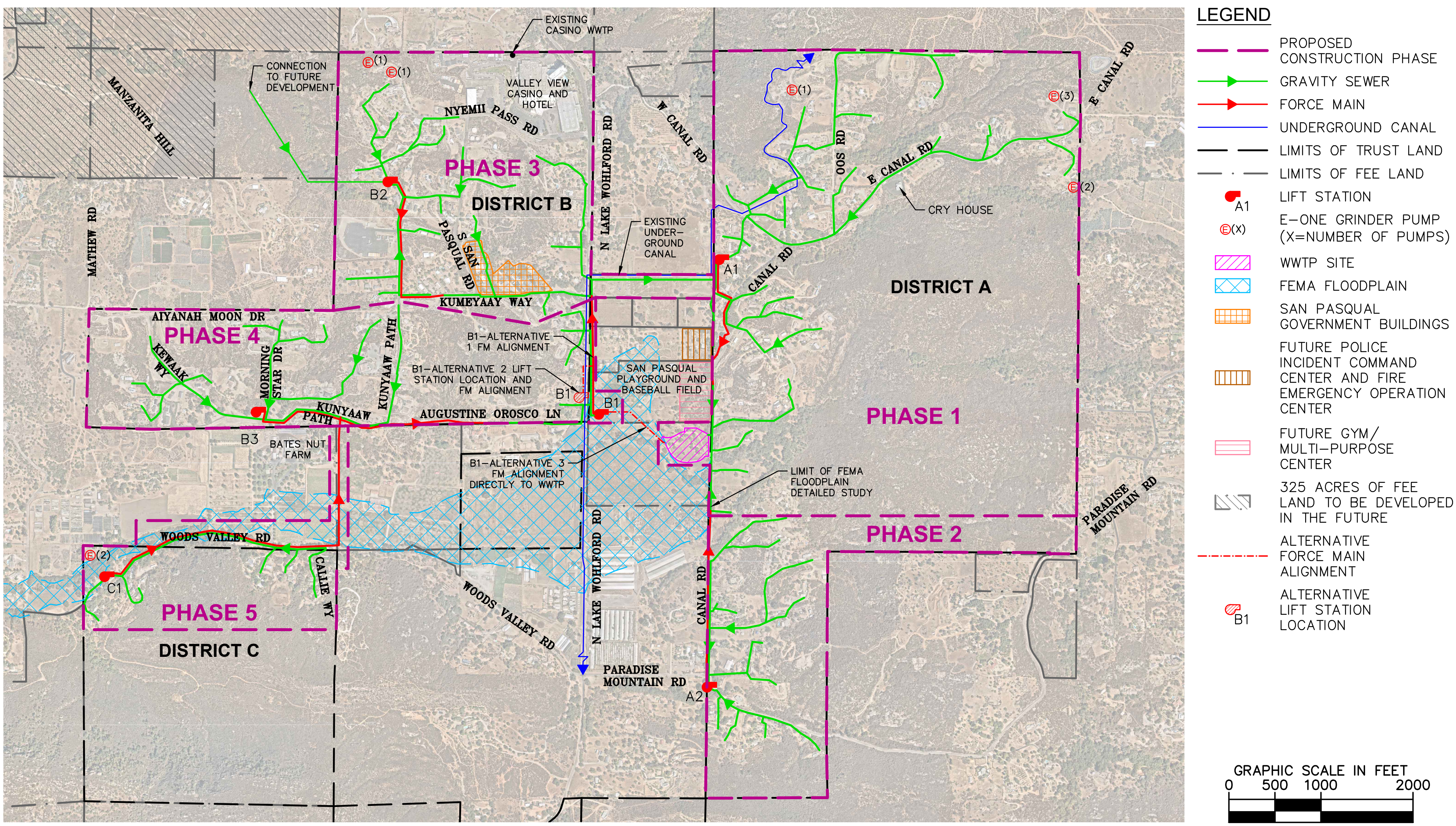

FIGURE 3.2: Phasing Plan

San Pasqual Community Sewer

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4.0 AFFECTED ENVIRONMENT

4.1 General Description

The affected environment encompasses those areas that could be directly affected if the San Pasqual Community Sewer Proposed Project (Proposed Project) is implemented. This chapter details the existing conditions in the General Study Area (GSA), Detailed Study Area (DSA), and Area of Potential Effect (APE). The environmental resource categories are organized to identify any relevant potential environmental impacts. The potential environmental impacts of the No Action and Proposed Project alternatives are discussed in Chapter 5.0, Environmental Consequences, of this Environmental Assessment (EA).

4.1.1 Overview of Proposed Project Area and Environs

The Proposed Project area consists of mostly residential uses and smaller, neighborhood-scale commercial and light industrial uses. A full description of the Proposed Project is included in Chapter 1 of this EA. The proposed improvements would occur throughout the entirety of the Reservation, with some areas within the existing footprint of the roadway infrastructure and others in undeveloped locations. The Proposed Project area, being multiple district areas (Districts A, B, and portions of C) of the San Pasqual Band of Mission Indians (Band) Reservation Area, include varied terrain and elevations. Representative photos of the Proposed Project area are shown in ***Figure 4.1: Site Photos***.

Surrounding land use designations to the west and south are for mixed-use and land use designations to the north and east are for medium residential. The existing land uses to the west and south consist of vacant land with sparse commercial retail developments, and to the north and east, land uses consist of existing residential developments.

District A of the Band Reservation area is largely undeveloped and vacant with the majority of development placed along the northern and western portions of the district. Most developments within District A consist of residential units along with scattered, smaller commercial uses. Development within District A is located along Canal Road which forms the western border of the district.

District B of the Reservation area is largely developed with residential uses and commercial uses. District B also includes light industrial uses such as storage yards as well as farms and other agricultural uses. District C within the Proposed Project areas is largely undeveloped with residential structures occupying the northeast corner of the district.

4.1.2 Location Maps

The San Pasqual Band Reservation area is located within the County of San Diego (County) in the State of California (State). The Proposed Project area is southeast, of the Valley Center Census Designated Place and west of Hellhole Canyon County Preserve. The Proposed Project area is approximately 1.5 miles south of the Rincon Band of Luiseno Indians Reservation.

Locally, the site is approximately 8.5 miles north of State Route 78 (SR-78), 9.6 miles east of Interstate 15 (I-15) and 0.75 miles south of San Diego County Route S6 (S6).

The Proposed Project area would comprise three districts of the Band Reservation Area and an additional parcel of land within the northwestern portion of the County of San Diego in the State of California. The Proposed Project would occupy 13 parcels with Assessor Parcel Numbers as follows: 18906025; 18918114; 77189170; 18917105; 19003109; 19017101; 19017202; 19004002; 18918051; 18919109; 18918115; 18908027; and 18906024.

4.1.3 Resource Areas Not Affected by the Proposed Project

Wild and Scenic Rivers

According to the National Wild and Scenic Rivers System, the Proposed Project area is not located adjacent to, or near, any categorized wild and scenic rivers. Further, no wild and scenic rivers are located in the County of San Diego.[1] As such, this resource would not be affected by the Proposed Project.

4.1.4 Existing Condition Imagery

See ***Figure 4.1: Site Photos***.

4.2 Topography, Geology, and Soils

4.2.1 Regulatory Setting

No soil or geologic regulations are applicable to the Proposed Project.

4.2.2 Affected Environment

The Proposed Project area contains varied terrain and steep slopes. The steepest slopes occur in District C, with District A containing steep slopes away from the developed area, and moderate slopes throughout District B. The proposed Wastewater Treatment Plant would occupy an area which does contain light slopes with moderate slopes appearing at the western border of District A.[2]

The United States Department of Agriculture Natural Resource Conservation Service (NRCS) custom soil report (**Appendix A**) generated for this Proposed Project shows that the Proposed Project area contains multiple soil types. ***Table 4.1: Soil Composition*** below summarizes the soil types present within the Proposed Project area. ***Figure 4.2: Soil Composition*** and ***Figure 4.3: Soil Key*** shows the soil composition of the general Proposed Project Area.

Table 4.1: Soil Composition

Soil Symbol	Soil Description
AcG	Acid igneous rock
CmrG	Cieneba-Rock outcrop complex, 30 to 75 percent slopes, very stony
CnE2	Cieneba-Fallbrook rocky sandy loams, 9 to 30 percent slopes, eroded
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded
FaC2	Fallbrook sandy loam, 5 to 9 percent slopes, eroded
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded
FvD	Fallbrook-Vista sandy loams, 9 to 15 percent slopes
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19
VaB	Visalia sandy loam, 2 to 5 percent slopes
VsD	Vista coarse sandy loam, 9 to 15 percent slopes, MLRA 20
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes

Source: Natural Resource Conservation Service (NRCS). 2024. Custom Soil Resource Report for San Diego County Area, California San Pasqual Community Sewer Conversion. Page 11. Retrieved from: https://websoilsurvey.sc.egov.usda.gov/WssProduct/tifrwcdzxind02qlkdi5ugpp/GN_00002/20240302_21592709476_63_Soil_Report.pdf (Accessed March 2, 2024).

1 National Wild and Scenic Rivers System. 2024. National Wild and Scenic Rivers System California. Retrieved from: https://www.rivers.gov/california (Accessed June 13, 2024).

2 United States Geological Survey (USGS). 2024. National Map. 3DEP Elevation – Slope Map Layer. Retrieved from: https://apps.nationalmap.gov/viewer/ (Accessed March 2, 2024).

The Proposed Project area does not exist along a known fault line.[3] The Proposed Project area does not exist within a region which is known to have expansive clays or landslide susceptibility.[4] Additionally, the Proposed Project area does not contain known minerals of value.[5]

4.3 Water Resources

4.3.1 Regulatory Setting

Section 404 United States Army Corps of Engineers

Section 404 of the Clean Water Act is administered and enforced by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA). Section 404 establishes a program to regulate the discharge of dredged and fill material into Waters of the United States, including wetlands and coastal areas below the mean high tide. USACE administers the day-to-day program, and reviews and considers individual permit decisions and jurisdictional determinations. USACE also develops policy and guidance and enforces Section 404 provisions.

Clean Water Act

Pursuant to Section 404 of the Clean Water Act (33 U.S. Code [USC] Section 1251 et seq.; CWA), the USACE is authorized to regulate any activity that would result in the discharge of dredged or fill material into waters of the U.S. (including wetlands), which include those waters listed in 33 Code of Federal Regulations (CFR) 328.3 (as amended at 88 Federal Register (FR) 61964, September 8, 2023).

The Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board (SWRCB), is required to provide "certification that there is reasonable assurance that an activity that may result in the discharge to waters of the U.S. will not violate water quality standards." Water Quality Certification must be based on the finding that proposed discharge will comply with applicable water quality standards.

The National Pollutant Discharge Elimination System (NPDES) is the permitting program for discharge of pollutants into surface waters of the U.S. under CWA § 402.

Clean Water Rule

On September 12, 2019, the EPA and Department of the Army signed a final rule to repeal the 2015 Clean Water Rule (2015 Rule) and re-codify the regulatory text defining "waters of the United States" that existed prior to the 2015 Rule. The new regulations went into effect on December 23, 2019. One of the proposed changes includes ephemeral features that contain water only during or in response to rainfall would no longer be considered "waters of the United States' under the jurisdiction of the USACE.

The EPA and USACE are in receipt of the U.S District Court for the District of Arizona's August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of Pascua Yaqui Tribe v. U.S. Environmental Protection Agency. On October 22, 2019, the EPA and USACE published a final rule to repeal the 2015 Clean Water Rule: Definition of "waters of the United States" (2015 Rule), which amended portions of the CFR, and to restore the regulatory text that existed prior to the 2015 Rule.

The final "Revised Definition of 'Waters of the United States' rule (the 2023 Rule) became effective on March 20, 2023. On August 29, 2023, the U.S. EPA and USACE issued a final rule to amend the 2023 Rule to conform with the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v Environmental Project Agency* (parts of

[3] United States Geological Survey (2024). United States Quaternary Faults. Retrieved from: https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf (accessed March 2, 2024).

[4] County of San Diego. 2021. San Diego County General Plan. Safety Element. Pages 7-22 through 7-23. Retrieved from: https://www.sandiegocounty.gov/content/dam/sdc/pds/docs/GP/GENERAL%20PLAN_April2022_PRINT.pdf (accessed March 2, 2024).

[5] Ibid. Page 5-22.

the January 2023 Rule are invalid under the Supreme Court's interpretation of the Clean Water Act in the Sackett decision). Therefore, the jurisdictional delineation prepared for this Project is consistent with the 2023 Rule and August 29 amendment and includes measurement of the Ordinary High Water Mark (OHWM) to determine Waters of the United States (WoUS).

National Pollutant Discharge Elimination System

Under the NPDES program (under § 402 of the CWA), all facilities that discharge pollutants from any point source into Waters of the United States must have a NPDES permit. The term "pollutant" broadly applies to any type of industrial, commercial, residential, municipal, and agricultural waste discharged into water. Point sources can be publicly owned treatment works (POTWs), industrial facilities, and urban runoff. Direct sources discharge directly to receiving waters, and indirect sources discharge to POTWs, which in turn discharge to receiving waters. Under the national program, NPDES permits are issued only for direct point-source discharges. NPDES issues two basic permit types: individual and general.

All construction sites one acre or more in size, must file for and obtain an NPDES construction general permit.

Section 303(d) Total Maximum Daily Loads

Section 303(d) requires that states assess the quality of their waters every two years and publish a list of those waters not meeting the water quality standards established for them. Such waters are then identified as being an "impaired water body." Water quality standards are found in the Water Quality Control Plan for the San Diego Basin (Basin Plan) (RWQCB 2011), and include beneficial uses, water quality objectives necessary to protect these uses, and the antidegradation policy. For water bodies placed on the 303(d) List of Water Quality Limited Segments, states are required to develop total maximum daily loads for the pollutants that are causing impairment of the water quality standards. Once a water body is placed on the 303(d) List of Water Quality Limited Segments, it remains on the list until a total maximum daily load is adopted and the water quality standards are attained, or there is sufficient data to demonstrate that water quality standards have been met and delisting from the 303(d) list should take place.

The State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs) produce bi-annual qualitative assessments of statewide and regional water quality conditions. These assessments are focused on CWA Section 303(d) impaired water listings and scheduling for assignment of Total Maximum Daily Load (TMDL) requirements. States are required to identify and document any and all polluted surface water bodies, with the resulting documentation referred to as the Clean Water Act Section 303(d) List of Water Quality Limited Segments, or more commonly the 303(d) list. This list of water bodies identifies the associated pollutants and TMDLs, along with pollutant sources and projected TMDL implementation schedules/status. A TMDL establishes the maximum amount of an impairing substance or stressor that a water body can assimilate and still meet water quality standards. Additionally, TMDLs allocate that load among pollution contributors. TMDLs are quantitative tools for implementing state water quality standards, based on the relationship between pollution sources and water quality conditions.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (42 USC Section 300f et seq.) is intended to protect public health by regulating the nation's public drinking water supply. The Federal SDWA authorizes the U.S. EPA to set national standards for drinking water to protect against both naturally occurring and man-made contaminants.

National Flood Insurance Act

The National Flood Insurance Act (1968) established the National Flood Insurance Program (NFIP), which is based on the minimal requirements for floodplain management and is designed to minimize flood damage within Special Flood Hazard Areas (SFHAs). FEMA administrates the NFIP. SFHAs are defined as areas that have a one percent chance of flooding within a given year. This is also referred to as the 100-year flood. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community.

Executive Order 11988 (Floodplain Management)

Executive Order 11988 (EO 11988) requires that developments avoid impacts to flood plains, to the extent possible. This requires that each federal agency determine whether a project is located within a floodplain and consider alternatives to a project's location within a floodplain, if possible. If the project must reside within a floodplain, the agency must minimize any potential impacts.

Executive Order 11990 (Protection of Wetlands)

Executive Order 11990 (EO 11990) requires an examination of impacts to wetlands and the maintenance of wetland areas on federal properties. Per the CWA, wetlands are defined as those areas "that are inundated or saturated by surface or groundwater 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" (CFR Title 33, Section 328.2[b]). EO 11990 does not prevent the issuance of federal agency permits on non-federal properties. However, EO 11990 does take effect for proposed actions requiring federal financing. This EO requires that projects which would effect wetland resources be analyzed under NEPA in order to minimize potential impacts to wetland resources.

Four federal agencies are directly responsible for the identification of wetlands as part of the implementation of a variety of federal laws and policies. These agencies are the U.S. Army USACE, EPA, U.S. Fish and Wildlife Service (USFWS), and NRCS. The EPA also has authority over wetlands and may override a USACE permit.

When a project may create impacts for wetlands, the project generally requires a permit. Substantial impacts to wetlands may require an Individual Permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits.

4.3.2 Affected Environment

Surface Water and Groundwater

The Escondido Canal, now an underground stormwater pipeline, crosses District A of the Proposed Project area immediately east of Canal Road in a north/south direction. The Proposed Project area does not contain other standing bodies of water. The Band Reservation area is not directly above a known groundwater basin. The nearest groundwater basin to the Proposed Project area is the Upper San Luis Rey Valley approximately 0.8 miles north of District A and District B. [6]

Floodplain

The Proposed Project area includes a portion of the Moosa Canyon Subwatershed within the larger Lower San Luis Rey River Watershed. The Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Map (FIRM), which was developed in partnership with the County of San Diego shows that Special Flood Hazard Areas (SFHAs) delineated within or near the project site include:

1) Zone AE - floodplain limits resulting from the 1% annual chance event (aka 100-year storm). Zone AE floodplains are computationally derived and result in the determination of specific Base Flood Elevations (BFEs).

[6] San Diego County Water Authority. 2020. 2020 Urban Water Management Plan. Page 5-8. Retrieved from: https://www.sdcwa.org/wp-content/uploads/2021/03/Draft-2020-UWMP.pdf (accessed March 3, 2024).

2) Zone AO - area of shallow, or unconfined flows and generally considered to be less than 3' depth.

3) Zone X (shaded) - area of moderate potential flood risk, or the floodplain limits associated with the 0.2% annual chance event (aka 500-year storm).

4) Regulatory Floodway - the regulatory floodway is the portion of Zone AE that is restricted from development due to increased risk. It is characterized with deep and swiftly flowing water. Floodways are computationally derived through an encroachment analysis and are the primary tool used by most member communities to apply flood risk to the land planning process.

Figure 4.4: Existing Hydraulic Conditions, shows the FEMA flood zone categories which appear on the Proposed Project area, as well as the flood areas identified during the floodplain modeling conducted for the Band's Proposed Project. The Proposed Project area is within the Federal Emergency Management Agency (FEMA) Zone A(E), Area of High Risk Flood Hazard.

Wetlands

The Proposed Project area is located in three sub-watersheds, all within the San Luis Rey-Escondido Watershed. The northeast portion of the Proposed Project area is located within the Paradise Creek – San Luis Rey River Sub-watershed (Hydrological Unit code 12 [HUC12] 180703030201), the northwest corner of the Proposed Project area is located within the Keys Creek Sub-watershed (HUC12 180703030204), and the southern area of the Proposed Project area is located within the Moosa Canyon Sub-watershed (HUC 180703030301). The Survey Area is within the foothills west of Paradise Mountain, a part of the Peninsular Mountain Ranges. Waters initially flow in different directions based on the topography of the three sub-watersheds encompassing the Survey Area, before all discharging into the San Luis Rey River which flows parallel to State Route (SR) 76 before eventually emptying into the Pacific Ocean, between Oceanside and Marine Corps Base Camp Pendleton.

Non-wetland waters include drainages that have connectivity to the San Luis Rey River by following the path of flow via Paradise Creek, Keys Creek, and Moosa Canyon Stream, of which 1.45 acres are potential USACE jurisdictional waters. Additionally, a total of 6.53 acres of wetland vegetation is present within the Proposed Project area, including a 100-ft area surrounding the Proposed Project area, that are potentially under the jurisdiction of the USACE. Per EO 11990, USACE is one of the federal agencies which are responsible for identifying wetland resources.

4.4 Biological Resources

4.4.1 Regulatory Framework

Federal Endangered Species Act

The federal Endangered Species Act of 1973 (ESA; 16 U.S.C Section 1531 et seq.), as amended, provides for the listing of endangered and threatened species of plants and animals and the designation of critical habitat for listed species. The ESA regulates the "taking" of any endangered fish or wildlife species, per Section 9 of the ESA. As development is proposed, the responsible agency or individual landowner is required to consult with the USFWS to assess potential effects to listed species (including plants) or its critical habitat, pursuant to Section 7 and 10 of the ESA. During Section 7 consultation with USFWS, IHS as the lead agency shall make a Finding of Effect and shall obtain USFWS concurrence with said Finding of Effect. If it is determined that potential effects to a species would likely occur, measures to avoid or reduce such effects must be identified. USFWS may issue an incidental take statement, following consultation and the issuance of a Biological Opinion. This allows for take of the species that is incidental to another authorized activity, provided that the action will not adversely affect the existence of the species. Section 7 of the ESA provides for the provision of an incidental take statement for projects where interagency cooperation is necessary to ensure that a federal action/decision does not jeopardize the existence of a listed species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703-711), provides legal protection for almost all bird species occurring in, migrating through, or spending a portion of their life cycle in North America by restricting killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. USFWS determined it was illegal under the MBTA to directly kill or destroy an active nest (nest with eggs or nestlings) of, nearly any bird species (with the exception of non-native species through the MBTA Reform Act of 2004). Certain game bird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the MBTA is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities:

- Falconry
- Raptor propagation
- Scientific collecting
- Special purposes, such as rehabilitation, education, migratory game bird propagation, and salvage
- Take of depredating birds, taxidermy, and waterfowl sale and disposal

The regulations governing migratory bird permits can be found in Title 50, Part 13 (General Permit Procedures) and Part 21 (Migratory Bird Permits) of the CFR.

4.4.2 Affected Environment

A Biological Survey Report for the Proposed Project was prepared by Chambers Group, Inc. in May 2024 (**Appendix E**) to determine potential effects to biological resources and jurisdictional waters with the Proposed Project. The methodology for determining the effects to biological resources as a result of the Proposed Project included a literature review, jurisdictional delineation, a biological field reconnaissance survey, and a records search through appropriate databases to determine historical occurrences of plant and wildlife species within the Proposed Project Area. The Proposed Action area encompasses approximately 173 acres of the San Pasqual Band of Mission Indians (SPBMI) Reservation. The Survey Area analyzed in the Biological Survey Report included a 100-foot (ft) buffer around the Proposed Action Area to account for potential staging areas, covering a total of 389 acres.

Additionally, IHS has completed informal consultation with USFWS as mandated by Section 7 of the ESA. Upon completion of consultation, USFWS proposed that IHS complete focused species surveys for coastal California gnatcatcher and least Bell's vireo. The results of the focused surveys determined that coastal California gnatcatcher and least Bell's vireo were absent from the Project site. The survey results were delivered to USFWS and IHS subsequently revised the determination of the effects to be "No Effect."

Threatened and Endangered Species

Vegetation Communities and Special Status Plant Species

Seventeen native vegetation communities and five other land cover types were identified within the Survey Area. Within the vegetation communities and land cover types, 98 plant species were observed and recorded. No special status species were observed during the survey effort. However, the Potential For Occurrence (PFO) of special status plant species to occur within the Survey Area (the Proposed Action area plus a 100-foot buffer) was determined by analyzing the quality of habitat, elevation, soil type, historical occurrences, and results of the field survey.

Through searches of historical records of occurrence through the appropriate databases (CDFW 2024; CNPS 2024), nine special status plant species are known to occur within the vicinity of the Proposed Survey Area. Of these nine plant species, four are considered absent, one has a low potential, and four have a moderate PFO within the Survey Area. The spreading navarretia is a federally listed threatened species has a low potential to occur within the Survey

Area because the habitat needed to support the species is limited and of poor quality. The four plant species that have a moderate potential to occur within the Survey Area include the San Diego thorn-mint and the thread-leaved brodiaea, which are both federally listed threatened species, as well as the San Diego ambrosia and Nevin's barberry, which are both federally listed endangered species.

All four plant species were determined to have a moderate PFO based on either of the following two criteria: if marginal habitat is present within the Survey Area and historical records of the species exist within the immediate vicinity of the Survey Area (approximately 3 miles); or if the habitat requirements or environmental conditions associated with the species occur within the Survey Area, but no historical records exist within 5 miles of the Survey Area.

General Wildlife and Special Status Wildlife Species

A total of 54 wildlife species were detected during the survey. Wildlife species detected during the survey were characteristic of the existing Survey Area conditions. No special status species were observed during the survey effort. Habitat for nesting birds and raptors was present through the Survey Area. Additionally, the quality of habitat, elevation, soil type, historical occurrences, and results of the field survey were used to determine the PFO of special status wildlife species.

A database search (CDFW 2024l, USFWS 2024b and 2024d) identified 10 special status wildlife species that may potentially occur within the Survey Area, all of which include federally listed endangered species, federally listed threatened species, proposed listed endangered species, proposed listed threatened species, and Birds of Conservation Concern (BCC). Of the 10 identified special status wildlife species, six special status wildlife species were considered absent from the Survey Area, three species have a low PFO, and one species has a moderate PFO.

The three wildlife species that have low PFO within the Survey Area include the federally listed endangered southwestern willow flycatcher, the federally listed threatened Stephens' kangaroo rat, and the federally proposed threatened western spadefoot. These three wildlife species have a low potential to occur within the Survey Area since habitat is of poor quality and/or historical records of these species do not exist within 5 miles of the Survey Area.

The one wildlife species that has moderate PFO within the Survey Area is the federally listed endangered arroyo toad. This special status wildlife species has a moderate potential to occur within the Survey Area based on either of the following two criteria: if marginal habitat is present within the Survey Area and historical records of the species exist within the immediate vicinity of the Survey Area (approximately 3 miles); or if the habitat requirements or environmental conditions associated with the species occur within the Survey Area, but no historical records exist within 5 miles of the Survey Area.

United States Fish and Wildlife Service Critical Habitat

USFWS Critical Habitat is defined as areas of land, water, and air space containing the physical and biological features essential for the survival and recovery of endangered and threatened species. Designated Critical Habitat includes sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter. Designated Critical Habitat delineates all suitable habitat, occupied or not, that is essential to the survival and recovery of the species.

According to the USFWS Critical Habitat WebGIS map, the Survey Area does not occur within designated Critical Habitat (USFWS 2024b). The closest Critical Habitat is located approximately 2.2 miles southwest of the Survey Area (for coastal California gnatcatcher), 2.2 miles southeast of the Survey Area (arroyo toad), and 3.6 miles northeast of the Survey Area (southwestern willow flycatcher).

Wildlife Corridors and Migratory Birds

Wildlife corridors are areas that connect fragmented habitats. They serve as wildlife linkages between otherwise fragmented patches of habitat caused by changes in vegetation communities, rugged terrain, and human disturbances. The Proposed Project area is in a marginal wildlife corridor for mammals and local birds that travel through the mountain range and use the many waterways within the Survey Area. However, much of the surrounding area contains agricultural and low-density residential development, making much of the Proposed Project area suboptimal for wildlife movement. Furthermore, there is ample open space to the south and west of the Survey Area to allow for species movement. There are ephemeral and intermittent drainages that cross through the Survey Area which offer movement corridors for wildlife including migratory and riparian birds. The Escondido Canal previously meandered through the Survey Area and acted as a corridor for fish, toad, and riparian bird species with connectivity to Lake Wohlford. As part of the San Pasqual Undergrounding Project to remove, relocate, and replace approximately 2.5 miles of the Escondido Canal that crosses through the San Pasqual Indian Reservation, the Escondido Canal was largely rerouted outside of the Survey Area and undergrounded along North Wohlford Road in 2022. The original canal right-of-way (ROW) remains undeveloped and still acts as a corridor for wildlife but lacks an open water source for wildlife to drink from or aquatic movement.

4.5 Air Quality

4.5.1 Regulatory Setting

Federal Clean Air Act

Air Quality is federally protected by the Federal Clean Air Act (CAA) and its amendments. Under the CAA, the United States Environmental Protection Agency (U.S EPA) developed the primary and secondary National Ambient Air Quality Standards (NAAQS) for the pollutants including: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than or equal to 10 microns in diameter (coarse particulates or PM_{10}), particulate matter less than or equal to 2.5 microns in diameter (fine particulates or $PM_{2.5}$), and lead. The primary standards were established at levels sufficient to protect public health, with a satisfactory margin of safety. The secondary standards were established to protect public welfare from other adverse effects of air pollution.

The CAA requires that states identify those areas where the NAAQS are not met for criteria air pollutants. The U.S. EPA has designated such areas as nonattainment areas. A state with a nonattainment area must prepare a State Implementation Plan (SIP) that details the programs and requirements the state will use to meet the NAAQS by the deadlines specified in the CAA.

4.5.2 Affected Environment

This air quality impact analysis considers construction and operational impacts associated with the Proposed Project. Where criteria air pollutant quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. Air quality impacts were assessed according to methodologies recommended by the California Air Resources Board (CARB) and the San Diego County Air Pollution Control District (SDAPCD).

Attainment Status

The Proposed Project site is located within the San Diego Air Basin (SDAB). ***Table 4.2: San Diego County Attainment Status*** shows the attainment status of each criteria pollutant within the SDAB. Areas that meet NAAQS are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. Areas for which there is insufficient data available are designated unclassified. The Proposed Project will be below de minimis levels.

Table 4.2: San Diego County Attainment Status

Criteria Pollutant	Federal Designation
Ozone (8-Hour)	Nonattainment
Ozone (1-Hour)	Attainment [1]
Carbon Monoxide	Attainment
PM_{10}	Unclassifiable [2]
$PM_{2.5}$	Attainment
Nitrogen Dioxide	Attainment
Sulfur Dioxide	Attainment
Lead	Attainment
Sulfates	No Federal Standard
Hydrogen Sulfide	No Federal Standard
Visibility	No Federal Standard

Notes:

1. The federal 1-hour standard of 12 ppm was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.
2 At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.
3 The California Air Resources Board (CARB) has not reclassified the region to attainment yet due to (1) incomplete data, and (2) the use of non-California Approved Samplers (CAS). While data collected does meet the requirements for designation of attainment with federal PM2.5 standards, the data completeness requirements for state PM2.5 standards substantially exceed federal requirements and mandates and have historically not been feasible for most air districts to adhere to given local resources. APCD has begun replacing most regional filter-based PM2.5 monitors as they reach the end of their useful life with continuous PM2.5 air monitors to ensure collected data meets stringent completeness requirements in the future. APCD anticipates these new monitors will be approved as "CAS" monitors once CARB review the list of approved monitors, which has not been updated since 2013.

Source: San Diego County Air Pollution Control District, *Attainment Status*, https://www.sdapcd.org/content/sdapcd/planning/attainment-status.html, accessed April 2024.

The San Diego County Air Pollution Control District (SDAPCD) is responsible for ensuring that NAAQS are met in San Diego County. The SDAPCD monitors ambient air pollutant levels throughout the region and implements strategies to ensure the region attains the NAAQS.

Ambient Air Quality Conditions

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County. The monitoring stations continuously measure ambient concentrations of air pollutants and determine whether the ambient air quality meets the NAAQS and the CAAQS. These measurements are used to help forecast daily air pollution levels. ***Table 4.3: Ambient Air Quality Data*** summarizes the published monitoring data since 2020 for each year monitoring data is available. The two closest monitoring stations to the Proposed Project site include the Pala Airpad Monitoring Station and San Diego Rancho Carmel Drive Monitoring Station, located approximately 16 miles northwest and 20 miles southwest of the Proposed Project site, respectively.

Table 4.3: Ambient Air Quality Data

Criteria Pollutant	2020	2021	2022
Ozone (O_3) [1]			
1-hour Maximum Concentration (ppm)	0.057	0.064	0.087
8-hour Maximum Concentration (ppm)	0.052	0.059	0.080
Number of Days Standard Exceeded			
CAAQS 1-hour (>0.09 ppm)	0	0	0
NAAQS 8-hour (>0.070 ppm)	0	0	2
Carbon Monoxide (CO) [2]			
1-hour Maximum Concentration (ppm)	3.3	3.0	2.2
Number of Days Standard Exceeded			
NAAQS 1-hour (>35 ppm)	0	0	0
CAAQS 1-hour (>20 ppm)	0	0	0

Criteria Pollutant	2020	2021	2022
Nitrogen Dioxide (NO_2) [2]			
1-hour Maximum Concentration (ppm)	0.054	0.054	0.056
Number of Days Standard Exceeded			
NAAQS 1-hour (>.100 ppm)	0	0	0
CAAQS 1-hour (>0.18 ppm)	0	0	0
Particulate Matter Less Than 10 Microns (PM_{10})			
National 24-hour Maximum Concentration (µg/m³)	—	—	—
State 24-hour Maximum Concentration (µg/m³)	—	—	—
State Annual Average Concentration (CAAQS=20 µg/m³)	—	—	—
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 µg/m³)	—	—	—
CAAQS 24-hour (>50 µg/m³)	—	—	—
Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$) [2]			
National 24-hour Maximum Concentration (µg/m³)	40.2	23.5	14.9
State 24-hour Maximum Concentration (µg/m³)	*	*	*
Number of Days Standard Exceeded			
NAAQS 24-hour (>35 µg/m³)	3	0	0
NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; ppm = parts per million; µg/m³ = micrograms per cubic meter; – = not measured; * = insufficient data to determine the value			
Notes: 1. Measurements taken at the Pala Airpad Monitoring Station at 10848 Hwy 76, Pala, CA 92059. 2. Measurements taken at the San Diego Rancho Carmel Drive Monitoring Station at 11403 Rancho Carmel Drive, San Diego, CA 92128.			
Source: All pollutant measurements are from the CARB *Aerometric Data Analysis and Management System* database (https://www.arb.ca.gov/adam) except for CO, which were retrieved from the CARB Air Quality and Meteorological Information System (https://www.arb.ca.gov/aqmis2/aqdselect.php).			

State Implementation Plan

The CAA requires each state to prepare an air quality control plan referred to as the SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. Additionally, the SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SDAPCD is responsible for preparing and implementing the portion of the SIP applicable to the SDAB. The U.S. EPA has the responsibility to review all SIPs to determine whether they conform to the requirements of the CAA.

The most recent version of the SIP for San Diego County is the Eight-Hour Ozone Attainment Plan (Attainment Plan), adopted in October 2020, which incorporates plans for attaining and maintaining the 8-hour 75 parts per billion (ppb) and 70 ppb O_3 NAAQS by 2026 and 2032, respectively. To attain NAAQS the Attainment Plan accommodates emissions from all sources, including natural sources, through implementation of control measures on stationary sources. The Attainment Plan also considers emissions and reduction strategies related to mobile sources as regulated by U.S. EPA and CARB.

The SDAPCD relies on the Regional Air Quality Strategy (RAQS) to demonstrate how the region will comply with the O_3 NAAQS. The RAQS details how the region will manage and reduce O_3 precursors (NO_X and volatile organic compounds [VOC]) by identifying measures and regulations intended to reduce these pollutants.

4.6 Greenhouse Gases

4.6.1 Regulatory Setting

To date, no national standards have been established for nationwide GHG reduction targets, nor have any regulations or legislation been enacted specifically to address GHG emissions reduction at the project level.

4.6.2 Affected Environment

Greenhouse gas (GHG) emissions from human activities nearly doubled between 1970 and 2010 from approximately 27 gigatonnes (Gt) of CO_2 per year to nearly 49 GtCO_2 per year. California is a significant emitter of CO_2 equivalents (CO_2e) in the world and produced 381.3 million metric tons (MMT) of CO_2e in 2021.[7]

GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have much longer atmospheric lifetimes of 1 year to several thousand years that allow them to be dispersed around the globe.

4.7 Noise

4.7.1 Regulatory Setting

No federal noise regulations are applicable to the Proposed Project.

San Diego County Code Noise Ordinance

The County of San Diego Noise Ordinance (Title 3, Division 6, Chapter 4 of the County Code of Regulatory Ordinances; amended by Ordinance No. 9962) regulates construction-related noise within unincorporated areas of the County to protect public health and prevent disturbing, excessive, or offensive noise. The ordinance defines construction equipment broadly, as machinery or tools used in construction activities. Under County guidance, construction equipment operation is prohibited before 7:00 a.m., after 7:00 p.m., and on Sundays and County-recognized holidays. The ordinance establishes a maximum 75 dBA L_{eq} (8-hour) limit for general construction equipment noise measured at the property line or at an occupied receiving property.

4.7.2 Affected Environment

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Sound spreads (propagates uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics.[8]

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise as well as the time of day when the noise occurs. For example, the equivalent continuous sound level (L_{eq}) is the average acoustic energy content of noise for a stated period of time; thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. The Day-Night Sound level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the

[7] California Air Resources Board, *Current California GHG Emissions Inventory Data, 2000-2021 GHG inventory (2023 Edition)*, https://ww2.arb.ca.gov/ghg-inventory-data (accessed April 2024).

[8] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, Page 2-29, September 2013.

nighttime. The Community Noise Equivalent Level (CNEL) is a 24-hour average L_{eq} with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. and an additional 5 dBA weighting during the hours of 7:00 p.m. to 10:00 p.m. to account for noise sensitivity in the evening and nighttime. Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period.

Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA.[9] Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted:[10]

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Existing Noise Sources

Mobile traffic noise is the primary source of noise in the Proposed Project area. Other sources that contribute to the existing noise environment include those typical of rural residential areas (e.g., people talking, dogs barking, landscaping equipment, etc.).

To quantify existing ambient noise levels in the Proposed Project area, Kimley-Horn conducted five short-term (10-minute) measurements on March 7, 2024; see measurement results and locations in **Appendix G**. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Proposed Project site. The 10-minute measurements were taken between 10:20 a.m. and 11:52 a.m. Measurements of L_{eq} are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in ***Table 4.4: Existing Noise Measurements***.

Table 4.4: Existing Noise Measurements

Site	Location	Date	Time	Duration	L_{eq} (dBA) [1]
ST-1	Corner of Kewaak Wy and Lucky Ln	3/7/24	10:38-10:48 AM	10 Minutes	45.9
ST-2	Corner of Kunyaaw Path and Hatepaa Rd	3/7/24	10:20-10:30 AM	10 Minutes	63.9
ST-3	Corner of E Canal Rd and Vasquez Wy	3/7/24	11:32-11:42 AM	10 Minutes	50.0
ST-4	Corner of E Canal Rd and Eshash Rd	3/7/24	11:15-11:25 AM	10 Minutes	57.9
ST-5	Corner of Paradise Mountain Rd and Canal Rd	3/7/24	11:00-11:10 AM	10 Minutes	57.5
Source: Noise measurements taken by Kimley-Horn and Associates, March 7, 2024.					

Sensitive Receptors

Residences, hospitals, schools, guest lodging, libraries, and churches are considered as the most sensitive to noise intrusion and therefore have more stringent noise exposure targets than do other uses that are not subject to impacts such as sleep disturbance. The nearest noise-sensitive land uses include single-family residences located within approximately 50 feet of the Proposed Project site.

9 Compiled from James P. Cowan, *Handbook of Environmental Acoustics,* 1994 and Cyril M. Harris, Handbook of Noise Control, 1979.
10 Compiled from California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, and FHWA, *Noise Fundamentals,* 2017.

4.8 Land Use

4.8.1 Regulatory Setting

No regulations relating to Land Use are applicable to the Proposed Project.

4.8.2 Affected Environment

The Band Reservation is federally regulated and therefore is not required to comply with local, regional, and most State land use regulations. Uses within the Proposed Project Area include residential, commercial, and light industrial uses. Some agricultural uses are also present. A playground and recreational field exist approximately 400 feet northwest of the site of the proposed WWTP.

4.9 Historic Properties and Archaeological and Cultural Resources

4.9.1 Regulatory Framework

National Historic Preservation Act

The National Historic Preservation Act (NHPA) establishes the federal government policy on historic preservation and the programs through which this policy is implemented. Historic property includes any prehistoric or historic district, site, building, structure, or object and those included in, or determined eligible for inclusion in, the National Register of Historic Places (NRHP) are identified as Historic Properties. Historic Properties also include resources determined to be National Historic Landmarks (NHLs). NHLs are nationally significant historic places designated by the Secretary of the Interior (SOI) because they possess exceptional value or quality in illustrating or interpreting United States heritage. A property is considered historically significant if it meets one or more of the NRHP criteria and retains sufficient historic integrity to be able to convey its significance. This act also established the Advisory Council on Historic Preservation (ACHP), and independent federal agency that administers NHPA Section 106 by developing procedures to protect historic properties included in, or eligible for inclusion in, the NRHP (36 CFR Part 800.2(c)2(B(ii)).

Section 106 of the NHPA (36 CFR Part 800.2(c)2(B(ii)) requires that effects on historic properties be taken into consideration in any federal undertaking. The process has four steps: (1) initiating the Section 106 process, (2) identifying Historic Properties, (3) assessing adverse effects to historic properties, and (4) resolving adverse effects. Section 106 affords the ACHP and the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO) as well as other consulting parties, a reasonable opportunity to comment on any undertaking that would adversely affect historic properties. SHPOs administer the national historic preservation program at the state level, review NRHP nominations, maintain data on historic properties that have been identified but not yet nominated, and consult with federal agencies during Section 106 review. For lands held in Trust for use by a federally-recognized Tribe, the duties of the SHPO may instead be carried out by a THPO recognized by the National THPO Program administered by U.S. National Park Service. Such authority has been granted to the San Pasqual Band of Mission Indians and, therefore, NHPA actions and responsibilities outlined in this section reside with the San Pasqual THPO.

Eligibility for the NRHP rests on two factors: significance and integrity. In order to be eligible for inclusion in the National Register, a property must meet one or more of the criteria listed below (36 CFR § 60.4) and retain integrity:

- Criterion A: Association with “events that have made a significant contribution to the broad patterns of our history.”
- Criterion B: Association with “the lives of persons significant in our past.”

- Criterion C: Resources "that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."
- Criterion D: Resources "that have yielded, or may be likely to yield, information important to history or prehistory."

The National Register bulletin entitled *How to Apply the National Register Criteria for Evaluation* states that in order for a property to qualify for listing in the National Register, it must meet at least one of the National Register criteria by: (1) being associated with an important historic context, and (2) retaining historic integrity of those features necessary to convey its significance (National Park Service 1997). The historic context of a resource will define the theme(s), geographical limits, and period of significance by which to evaluate a resource's significance (National Park Service 1997:7). Generally, historic properties must be 50 years of age or more to be eligible for listing in the National Register. According to the National Park Service (1997:2), "properties that have achieved significance within the past 50 years shall not be considered eligible" unless such properties are "of exceptional importance." In addition to being significant under one or more of these criteria, NRHP eligibility requires that a resource retain sufficient integrity to convey its significance. Integrity is evaluated through consideration of characteristics that existed during a property's period of significance. Integrity is evaluated with regard to the retention of seven elements:

- Location: The place where the historic property was constructed
- Design: The combination of elements that create the form, plans, space, structure, and style of resource property
- Setting: The physical environment of the historic property, including the landscape and spatial relationship of the buildings
- Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property
- Workmanship: The physical evidence of the crafts of a particular culture or people during any given period of history or prehistory
- Feeling: The property's expression of the aesthetic or historic sense of a particular period of time
- Association: The direct link between an important historic event or person and a historic property

The NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be eligible for NRHP inclusion (Section 101(d)(6)(A)). Additionally, a broader range of Traditional Cultural Properties (TCPs) are also considered and may be eligible for or listed in the NRHP. TCPs are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and that may be eligible because of their association with cultural practices or beliefs of living communities that are rooted in that community's history and are important in maintaining the continuing the community's traditional beliefs and practices.

Section 106 of the National Historic Preservation Act of 1966 requires tribal consultation in all steps of the process when a federal agency project or effort may affect historic properties that are either located on tribal lands, or when any Native American tribe or Native Hawaiian organization attaches religious or cultural significance to the historic property, regardless of the property's location (36 CFR Part 800.2(c)2(B(ii)).

4.9.2 Affected Environment

A Historic Property Inventory (HPI) was prepared by Kimley-Horn in January 2024 (included in this document at **Appendix H**). The purpose of the HPI is to ensure the inventory and consideration of historic properties that may be adversely affected as a result of the Proposed Project. The HPI was prepared pursuant to requirements set forth under Section 106 of the NHPA (36 CFR Part 800.2(c)2(B(ii)) and NEPA, as well as the Indian Health Service's Environmental Review Manual. The IHS is the lead Federal agency responsible for compliance with Section 106 and its implementing regulations found at 36 CFR Part 800.

The Area of Potential Effects (APE) in the HPI for the Proposed Project is defined as 173 acres of land, which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP). It consists mostly of existing roadway, though does contain intact native soil outside of the roads and within the proposed location of the WWTP. A Sacred Lands File (SLF) search was conducted by the Native American Heritage Commission (NAHC) for the APE and adjacent areas on December 15, 2023 and produced negative results. A cultural resources records search was conducted through the South Coastal Information Center (SCIC) for the APE plus a 1-mile buffer on January 3, 2024 and produced positive results. Specifically, the records search results noted that 116 resource studies have taken place within 1-mile of the APE, 38 of which included a portion the APE. Additionally, the results noted 115 cultural resources were recorded within 1-mile of the APE, 15 of which overlapped with the APE. Previously recorded resources within the APE include 14 prehistoric archaeological sites and one (1) historic built environment resource (Escondido Canal). An intensive-level pedestrian field survey was conducted within the entirety of the APE from January 16 through January 19, 2024. During the field survey, all 15 previously recorded cultural resource site boundaries were relocated, though no cultural resources were identified at nine (9) sites. Additionally, eight (8) new cultural resources were recorded, which includes four (4) prehistoric isolates, two (2) prehistoric archaeological sites, one (1) multicomponent archaeological site, and one (1) historic built environment resource. As such, a total of 23 cultural resources were identified within the APE for the undertaking as a result of the records search and survey efforts, including four (4) prehistoric isolates, 16 prehistoric archaeological sites, one (1) multicomponent archaeological site, and two (2) historic built environment resources.

Of the 23 cultural resources identified within the APE, three (3) resources (CA-SDI-257, SDI-9916, and SDI-15666) exhibit the qualities required for eligibility for listing in the National Register of Historic Places (NRHP) and are recommended eligible Historic Properties under Section 106 of the NHPA ((36 CFR Part 800.2(c)2(B(ii)). The other 19 resources were not identified as eligible for listing in the National Register of Historic Places or as Historic Properties under Section 106 of the NHPA (36 CFR Part 800.2(c)2(B(ii)). Various uses of the area (i.e., residential development) and exposures to heavy rain/flooding have greatly impacted the physical integrity of cultural resources recorded on site. Though, the entire APE maintains a high archaeological sensitivity of surface and buried resources.

4.10 Public Services and Infrastructure

4.10.1 Regulatory Setting

No regulations relating to public services and infrastructure are applicable to the Proposed Project.

4.10.2 Affected Environment

Fire Protection

Fire protection services for the Band are provided by the San Pasqual Reservation Fire Department (SPRFD). The SPRFD maintained a 20-person staff as of 2026. The fire fleet consists of three fire engines, two command vehicles, and one aerial truck.[11]

Law Enforcement

Law enforcement services for the Band are provided by both the San Pasqual Tribal Police Department (SPTPD) and the San Diego County Sheriff Department (SDCSD). The joint efforts of both the SPTPD and SDSD allows for the ability for law enforcement officers to provide safety measures both within the Band Reservation area and outside, within the County. The SPTPD also enforces violations of the Band's Peace and Security Ordinance.[12]

[11] San Pasqual Band of Mission Indians. 2018. Fire Department. Retrieved from: https://www.sanpasqualbandofmissionindians.org/departments/fire-department (accessed March 3, 2024).

[12] San Pasqual Band of Mission Indians. 2018. San Pasqual Tribal Police Department. Retrieved from: https://www.sanpasqualbandofmissionindians.org/departments/public-safety-federal-police-department (accessed March 3, 2024).

4.11 Utilities

4.11.1 Regulatory Setting

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) (42 USC Section 300f et seq.) is intended to protect public health by regulating the nation's public drinking water supply. The Federal SDWA authorizes the U.S. EPA to set national standards for drinking water to protect against both naturally occurring and man-made contaminants.

4.11.2 Affected Environment

Water

The San Pasqual Domestic Water Authority (SPDWA) is the water provider for the Band and the Proposed Project area.[13] The SPDWA sources its domestic water supply via groundwater wells in District A and District C. A secondary source of water for the tribe is sourced from Valley Center Municipal Water District.[14] The SPDWA does not include water usage in their 2021 Consumer Confidence Report (CCR), however, the SPDWA 2018 Water Quality Report notes that the Band's water usage in 2018 was approximately 4.05 million cubic feet of water, or approximately 30.3 million gallons of water (approximately 93.1 Acre Feet [AF]).[15]

The San Pasqual Domestic Water Authority owns and operates three public water systems that serve Districts A, B, and C (San Pasqual Domestic Water Authority, 2019). The public water systems in Districts A and B include a 200,000-gallon and a 100,000-gallon water storage tank (Flores, 2014). It is intended that water to District C will ultimately be provided by Valley Center Municipal Water District (VCMWD) and a private well. The Valley View Casino complex receives water from VCMWD. All homes and Tribal governmental buildings are metered.

The Valley View Casino produces Recycled Water that the Band is able to use. The Band has an existing recycled water system for irrigation and fire-fighting suppression in both Districts A and B.

Wastewater

The Band currently utilizes individual septic systems to treat and dispose of wastewater. The Proposed Project area contains approximately 393 existing septic systems.

Solid Waste

Solid waste disposal for the Band is managed by the San Pasqual Environmental Department (SPED). The SPED operates a transfer station on the Band Reservation area which offers a variety of waste disposal services. However, the Transfer Station does not accept household waste.[16] Residential waste is managed by Waste Management of San Diego (Waste Management).[17]

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[13] San Pasqual Band of Mission Indians. 2024. San Pasqual Domestic Water Authority (SPDWA). Retrieved from: https://www.sanpasqualbandofmissionindians.org/departments/san-pasqual-domestic-water-authority (accessed March 3, 2024).

[14] San Pasqual Domestic Water Authority (SPDWA). 2019. San Pasqual Domestic Water Authority 2019 CCR. Page 3. Retrieved from: https://cdn.corecanvas.com/sanpasqual-723a8d62/media/original/5ef0f5b99954d0_CCR.2019_SPDW.pdf (accessed March 3, 2024).

[15] San Pasqual Domestic Water Authority (SPDWA). 2018. San Pasqual Domestic Water Authority 2018 Water Quality Report. Page 5. Retrieved from: https://cdn.corecanvas.com/sanpasqual-723a8d62/media/original/5ef0f5b99954d0_CCR.2019_SPDW.pdf (accessed March 3, 2024).

[16] San Pasqual Band of Mission Indians. 2019. San Pasqual Band of Mission Indians Tribal Building and Safety Policy. Page 17. Retrieved from: https://cdn.corecanvas.com/sanpasqual-723a8d62/media/original/5e4ee22fc4f0d1_20190312_TRIBAL%20BUILDING%20AND%20SAFETY%20POLICY%20Rev%201.pdf (accessed March 3, 2024).

[17] San Diego County. 2021. County Of San Diego Waste Hauler Service Area. Page 11. Retrieved from: https://www.sandiegocounty.gov/content/dam/sdc/dpw/SOLID_WASTE_PLANNING_and_RECYCLING/Files/Haulers-by-Area%20Aug%202021v2.pdf (accessed March 3, 2024).

Telecommunications

Cable and internet providers for the Band include those present in Valley Center, California. Cable providers include Spectrum, Cox, DirecTV, Mediacom, and Dish. Internet providers include T-Mobile, Cox, Hughsnet, Mediacom, and Viasat.[18]

Gas and Electricity

Electricity services on the reservation are provided by San Diego Gas and Electric (SDG&E).[19] Natural gas service is not available; homes must utilize individual propane tanks.

4.12 Hazardous Materials

4.12.1 Regulatory Setting

Toxic Substances Control Act/Resource Conservation and Recovery Act/Hazardous and Solid Waste Act

The Federal Toxic Substances Control Act of 1976 and Resource Conservation and Recovery Act (RCRA) established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law (U.S. Code Title 42, Chapter 103) provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA establishes requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. CERCLA also enables the revision of the National Contingency Plan (NCP). The NCP (Title 40, Code of Federal Regulation [CFR], Part 300) provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986, and was most recently amended again on July 8 2024, which designated PFOA and PFOS as hazardous substances.

GeoTracker is an online database that provides state-wide data of authorized or unauthorized discharges of waste to land, or unauthorized releases of hazardous substances from underground storage tanks. This system consists of a relational database, online compliance reporting features, a geographical information system (GIS) interface, and other features that are utilized by the State Water Resources Control Board, regional boards, local agencies, regulated industry, and the public to input, manage, or access compliance and regulatory tracking data. Additionally, EnviroStor, managed by the Department of Toxic Substances Control (DTSC), is an online database for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste sites with known or suspected contamination. Through CERCLA, also known as “Superfund,” the EPA oversees the cleanup of contaminated sites that include manufacturing facilities, processing plants, landfills, and mining sites.

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[18] CableTv. 2024. Tv and Internet Providers in Valley Center, California. Retrieved from: https://www.cabletv.com/ca/valley-center (accessed March 3, 2024).

[19] San Pasqual Band of Mission Indians. 2018. Environmental Department. Retrieved from: https://www.sanpasqualbandofmissionindians.org/departments/environmental-department (accessed March 3, 2024).

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and the National Priorities List

The U.S. EPA also maintains the Comprehensive Environmental Response Compensation (CERCLIS) and Liability Information System list. This list contains sites that are either proposed to be or on the National Priorities List (NPL), as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The NPL is a list of the worst hazardous waste sites that have been identified by Superfund.

Emergency Planning and Community Right-to-Know Act

The Federal Emergency Planning and Community Right-To-Know Act (EPCRA) was enacted to inform communities and residents of chemical hazards in their area. Businesses are required to report the locations and quantities of chemicals stored on-site to both State and local agencies. EPCRA requires the U.S. EPA to maintain and publish a digital database list of toxic chemical releases and other waste management activities reported by certain industry groups and Federal facilities. This database, known as the Toxic Release Inventory, gives the community more power to hold companies accountable for their chemical management.

Hazardous Materials Transportation Act

The U.S. Department of Transportation (DOT) receives authority to regulate the transportation of hazardous materials from the Hazardous Materials Transportation Act, as amended and codified (49 U.S.C. 5101 et seq.). The DOT is the primary regulatory authority for the interstate transport of hazardous materials and establishes regulations for safe handling procedures (i.e., packaging, marking, labeling, and routing).

In California, §31303 of the California Vehicle Code states that any hazardous material being moved from one location to another must use the route with the least travel time. This, in practice, means major roads and highways, although secondary roads are permitted to be used for local delivery. These policies are enforced by both the California Highway Patrol and the California Department of Transportation (Caltrans). Transportation of hazardous materials in relation to the Proposed Project include chemicals and solvents associated with construction as well as waste effluent and treatment chemicals associated with operation of the proposed WWTP.

Clean Water Act/SPCC Rule

The Clean Water Act (CWA) (33 U.S.C. §1251 et seq., formerly the Federal Water Pollution Control Act of 1972), was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA §402).

As part of the CWA, the U.S. EPA oversees and enforces the Oil Pollution Prevention regulation contained in Title 40 of the CFR, Part 112 (Title 40 CFR, Part 112), which is often referred to as the “SPCC rule” because the regulations describe the requirements for facilities to prepare, amend, and implement Spill Prevention and Countermeasures (SPCC) Plans. A facility is subject to SPCC regulations if a single oil (or gasoline, or diesel fuel) storage tank has a capacity greater than 660 gallons, the total above ground oil storage capacity exceeds 1,320 gallons, or the underground oil storage capacity exceeds 42,000 gallons, and if, due to its location, the facility could reasonably be expected to discharge oil into or upon the “Navigable Waters” of the United States.

Occupational Safety and Health Administration (OSHA)

Congress passed the Occupational and Safety Health Act to ensure worker and workplace safety. Their goal was to make sure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. To establish standards for workplace health and safety, OSHA also created the National Institute for Occupational Safety and Health as the research institution for OSHA. The Administration is a division of the U.S. Department of Labor that oversees the administration of OSHA and enforces standards in all states. OSHA standards are listed in Title 29 CFR Part 1910.

OSHA's Hazardous Waste Operations and Emergency Response Standard apply to five groups of employers and their employees. This includes any employees who are exposed or potentially exposed to hazardous substances (including hazardous waste) and who are engaged in clean-up operations; corrective actions; voluntary clean-up operations; operations involving hazardous wastes at treatment, storage, and disposal facilities; and emergency response operations.

4.12.2 Affected Environment

Based on a review of the U.S EPA Underground Storage Tanks (UTS) Finder, no current or previous cleanup site is within 1,000 feet of the Proposed Project Area. The nearest facility is the San Pasqual Fuel Station, approximately 2,600 feet northwest of District B of the Band Reservation Area.[20] The SWRCB Geotracker database shows the same result.[21] The EPA Superfund Site database also shows no sites within the vicinity of the Proposed Project area.[22] Additionally, there are no NPL sites on the Proposed Project site.

The SWRCB prepared a 2024 Integrated Report for Paradise Creek and Moosa Creek. Paradise Creek was assessed but was not listed on the 303(d) impaired waters list due to limited data. Additionally, the 2024 Integrated Report for Moosa Canyon Creek was assessed for nitrogen, and was determined to maintain its place on the 303(d) impaired waters list to be listed on the 303(d) list because 4 out of the 5 samples tested exceeded nitrogen thresholds.

4.13 Transportation

4.13.1 Regulatory Setting

No regulations relating to transportation are applicable to the Proposed Project.

4.13.2 Affected Environment

Based on aerial photography of the Band's Reservation area, the Proposed Project area consists mostly of single and two-lane low volume roadways. No high-volume roadways exist within the Proposed Project area. Additionally, no freeways are present within the Proposed Project site. All areas delineated for sewer and WWTP improvements contain existing low volume roadways. Within the WWTP site an existing unpaved roadway exists where a paved service road would be constructed as part of the Proposed Project.

[20] Environmental Protection Agency (EPA). 2024. Superfund National Priorities List (NPL) Where You Live Map. Retrieved from: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1 (accessed March 3, 2024).

[21] State Water Resources Control Board (SWRCB). 2024. Geotracker. Retrieved from: https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento (accessed March 3, 2024).

[22] Environmental Protection Agency (EPA). 2024. Superfund National Priorities List (NPL) Where You Live Map. Retrieved from: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1 (accessed March 3, 2024).

Photo 1: Vegetation West of Canal Road

Photo 2: Vegetation West of Lake Wolford Road

Photo 3: Vegetation West of N. Lake Wohlford Road

Photo 4: Culvert Opening on East Side of Canal Road

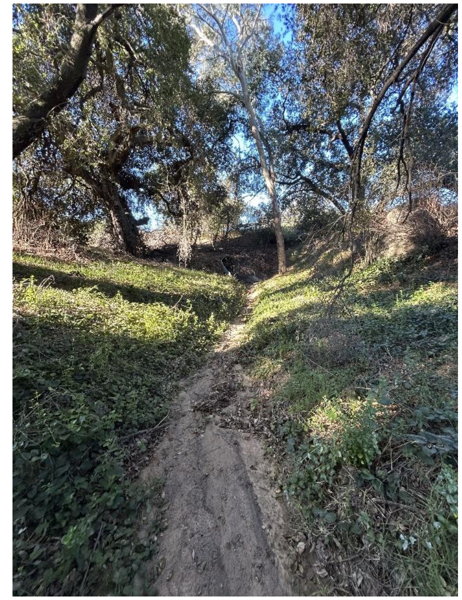

Photo 5: Vegetation Leading to Culvert Opening on East Side of Canal Road

Photo 6: Street Crossing Sign Near Canal Road Culvert

FIGURE 4.1: Site Photos

San Pasqual Community Sewer

Not to scale

Kimley»Horn

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Custom Soil Resource Report
Soil Map

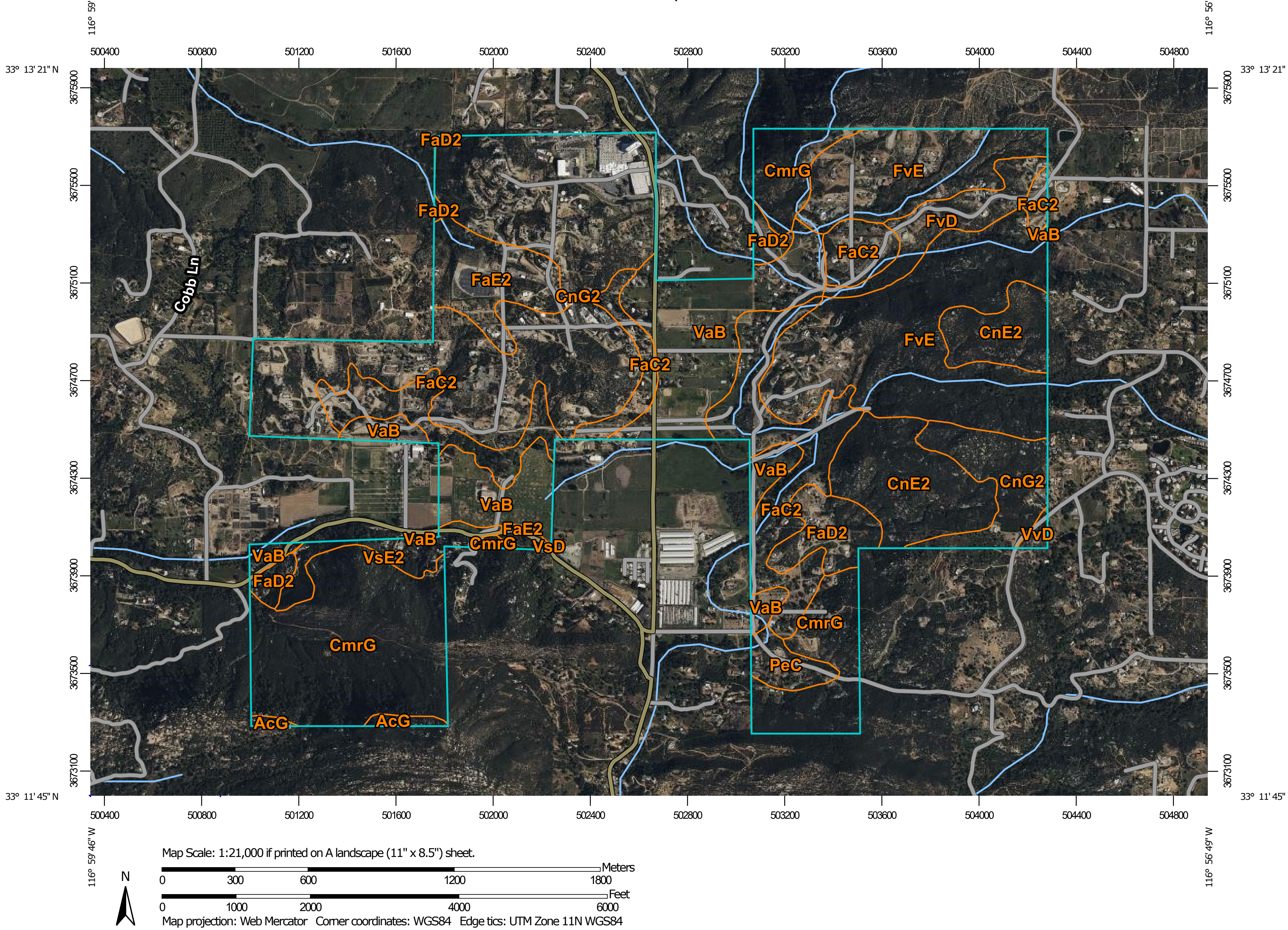

FIGURE 4.2: Soil Composition Map
San Pasqual Community Sewer

Not to scale

Kimley»Horn

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MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

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: San Diego County Area, California
Survey Area Data: Version 19, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

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.

FIGURE 4.3: Soil Composition Map Key
San Pasqual Community Sewer

Not to scale

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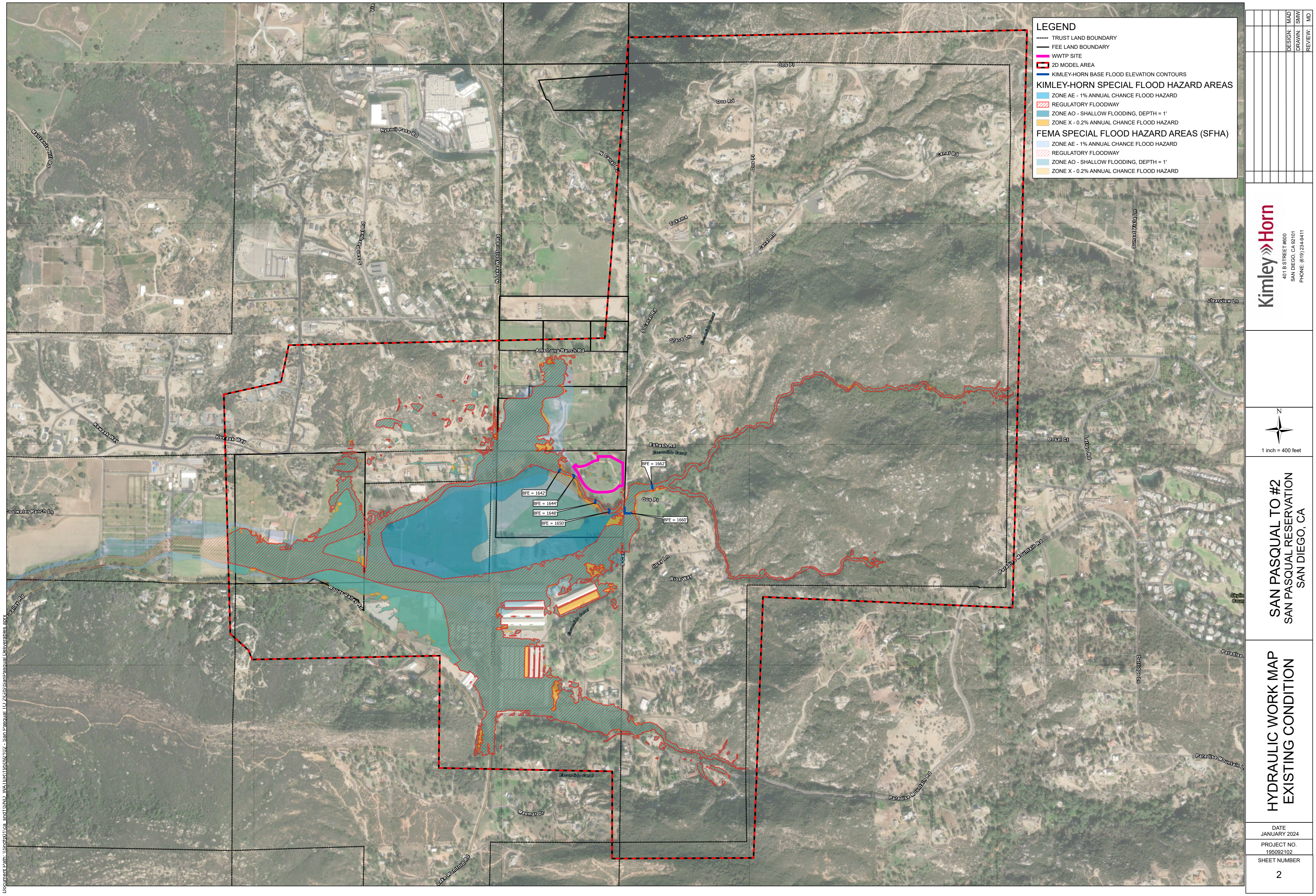

FIGURE 4.4: Existing Hydraulic Conditions
San Pasqual Community Sewer

Not to scale

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5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Impact Analysis

This chapter provides an assessment of potential impacts to each environmental category identified in Chapter 4, Affected Environment, to determine if potential direct impacts caused by the Proposed Project or the No Project Alternative are considered significant under NEPA or other applicable environmental laws.

The analysis includes an overview of the No Action alternative and the IHS Proposed Action (providing federal funding assistance) in support of the San Pasqual Community Sewer Proposed Project. The analysis considers direct impacts, defined as reasonably foreseeable effects directly associated with the Proposed Project. Where necessary, mitigation measures are discussed that would reduce or eliminate anticipated environmental impacts of the Proposed Project to less than significant.

5.1.1 Topography, Geology, and Soils

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not involve alterations to physical land resources.
Proposed Project	The Proposed Project would modify the existing landscape and include ground moving activities which would generate unsubstantial environmental effects. Mitigation is proposed to conduct a preconstruction conference including construction staff and qualified geologists and retain an onsite geologist to oversee construction. The preconstruction conference shall ensure the proper soil handling and grading procedures are implemented to reduce impacts to topography, geology, and onsite soils. During construction, the onsite geologist shall ensure that construction is implemented according to the recommendations provided in the Geotechnical Report.

No Project Alternative

Under the No Project Alternative, ground disturbing activities would not occur and geological resources and soils would remain undisturbed.

Proposed Project

Under the Proposed Project, the proposed wastewater force mains, gravity sewer lines, and recycled water distribution lines would occur along previously disturbed alignments for the majority of the alignments. The proposed WWTP would be constructed on a 8.5-acre portion of land between District A and District B. As shown in the custom soil report generated for the Proposed Project, the soil composition for this area is Visalia sandy loam occurring in 2 to 5 percent slope ranges. This area would include new structures and underground facilities which would involve earthwork in undeveloped and previously disturbed portions of the Proposed Project Area. See ***Figure 1.3: Wastewater Treatment Plant Site Layout*** for a diagram of the proposed WWTP area. New underground facilities would include recycled water lines and sewer lines. Additionally, percolation ponds would require earthwork to bury a portion of each structure below grade. Finally, a proposed service road is proposed which would loop around most of the WWTP facility from the admin building to the recycled water storage tank and require grading.

The WWTP portion of the Proposed Project area is generally flat and would not require additional precautions to prevent landslides or geologic hazards. The remaining Proposed Project area would not involve development which would be affected by geologic conditions. A geotechnical investigation has been completed for the Proposed Project (see **Appendix B**). Despite the low risk of potentially hazardous geologic impacts, mitigation is proposed to conduct preconstruction conference including construction staff and qualified geologist and retain an onsite geologist to oversee construction.

Mitigation Measures

MM GEO-1 Prior to commencing grading, a preconstruction conference should be held at the site with the Band's inspector, developer, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the grading plans can be discussed at that time.

MM GEO-2 Prior to the commencement of grading, a geotechnical consultant shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications.

5.1.2 Water Resources

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not involve alterations to water resources.
Proposed Project	The Proposed Project would not involve construction of structures that would alter or negatively impact wastewater, surface water, or groundwater resources. The Proposed Project would have positive impacts on groundwater resources due to the higher level of treatment it would provide to wastewater before disposal.

No Project Alternative

Under the No Project Alternative, residences and developments within the Proposed Project area would continue to utilize individual septic tanks for disposal which could directly lead to negative environmental effects due to tank leakage. Wastewater generated within the Proposed Project area would be partially treated before being released to percolate into the ground. Additionally, no improvements would occur that would impact the existing floodplain or surface water and groundwater, or resources. Therefore, no impact would occur to water resources.

Proposed Project

Surface Water and Groundwater

The Proposed Project would not modify nor alter any standing bodies of water or nearby rivers or canals. The Proposed Project would introduce a use which would percolate wastewater down into groundwater aquifers. However, the rate of percolation would be reduced compared to existing septic tank conditions. While the WWTP would allow for the same amount of wastewater generation, and would have a higher capacity, the use would remain consistent. As such, the addition of the recycled water facilities for landscape irrigation would reduce the amount of wastewater percolating into the groundwater aquifer. The proposed WWTP would also treat the wastewater such that the effluent constituents are of a higher quality than the existing septic systems' effluents, reducing the likelihood of negative impacts to groundwater resources. Impacts to surface and groundwater resources would be less than significant with the implementation of mitigation.

Floodplain

A floodplain analysis was conducted for the Proposed Project to assess the Proposed Project's hydrologic risks within a Special Flood Hazard Area (SFHA). The analysis concluded that floodplain conditions within the Proposed Project WWTP site and District A allow for careful development of aboveground structures (see **Appendix C**). Therefore, conditions would allow for development of the WWTP. With the implementation of mitigation, impacts would be less than significant.

Additionally, due to the Proposed Project's location within a known floodplain, the Project will complete an 8-Step Decision Making Process, as required by Executive Order (EO) 11988: Floodplain Management. As described in the 8-Step San Pasqual Impact Analysis Summary (**Appendix D**), Steps 1 through 6 have been completed and are included in this EA. IHS shall complete a final public notice of the EA (Step 7) and ensure post-implementation compliance after the EA review period has been completed (Step 8).

Comments were also received from the County of San Diego Public Works Department noting that wastewater infrastructure should be sited to avoid overlap with floodplains and floodways or be designed to prevent the mixture of stormwater and wastewater flows or subject wastewater infrastructure to harmful erosive forces. Additionally, County of San Diego Public Works Department required that plans be submitted to County of San Diego Public Works for review for any work that would occur within the County of San Diego's rights-of-way. This requirement is included as MM WR-3of this EA. Comments from the County of San Diego Public Works are included in **Appendix D**.

The United States Department of Health and Human Services (HHS) provided a letter responding to a request for the approval of construction of the San Pasqual sewer system and WWTP within a Federal Flood Risk Management Standard (FFRMS) floodplain. The request was approved by an HHS Senior Real Property Officer on December 9, 2024. This letter and approval is included in **Appendix D**.

Wetlands

Chambers Group biologists conducted a jurisdictional delineation of waters regulated by the USACE within the Survey Area. Potential USACE jurisdictional areas identified during the literature search and aerial image analysis were field checked for the presence of definable channels, soils, wetland vegetation, riparian habitat, and hydrology. Potential wetlands were evaluated using the methodology set forth in the 1987 Corps of Engineers Wetlands Delineation Manual (1987 Wetland Manual; USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (version 2.0) (2008 Arid West Supplement; USACE 2008).

Five wetlands mapped in the NHD and NWI databases were found to be present during the field survey (See Figures 4 and 5 in **Appendix E** of this EA). These wetlands were found within several drainages. Wetlands D2-W1, D2-W2, D12-W1, and D15-W1 were found within drainages D2, D12, and D15, which show connectivity to the San Luis Rey River, a Traditionally Navigable Waters (TNW). Wetland D8-W1 was present within the downstream terminus of Drainage D8, where the drainage appeared to lose downstream connectivity. In total, wetlands comprise approximately 6.53 acres of the Proposed Project area. Wetland vegetation within the Survey Area was dominated by California Sycamore - Coast Live Oak Riparian Woodland and Goodding's Willow - Red Willow Riparian Woodland (see **Appendix E**). However, due to the nature of the Project's occupation of previously developed areas, it is assumed that wetlands would be avoided to the extent feasible. As well, work areas would be chosen in developed and bare ground areas away from waterways to avoid the potential for spills and runoff near water resources. Project direct impacts would stem from unregulated infiltration of material to waterways or the substantial reduction of wetland resources.

Additionally, mitigation will be implemented requiring the procurement of a Section 404 permit prior to Project authorization to ensure that work areas, staging areas, and final structure placements are away from waterways and avoid potential impacts to water resources. With the implementation of mitigation, impacts would be less than significant.

Mitigation Measures

MM WR-1 Development within Special Flood Hazard Areas outside of the floodway (i.e., District A or elsewhere) is appropriate from the perspective of flood risk/flood impact provided that:

1. New structures are properly elevated above Base Flood Elevations, and
2. Project hydrology is mitigated to pre-project conditions.

MM WR-2 If avoidance of Waters of the United States is not feasible, a Section 404 permit will be required for Project authorization. USACE will review and verify the jurisdictional delineation and determine mitigation requirements for the Proposed Project, if applicable.

MM WR-3 Prior to construction activities which involve County-maintained roadways, plans would be submitted to County of San Diego for review of any work within the county right of way, or any work that could impact the county right of way or any county roadway drainage facilities.

5.1.3 Biological Resources

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not result in adverse impacts to biological resources or jurisdictional waters as the Proposed Project area would remain in its current condition.
Proposed Project	The Proposed Project would not involve construction of structures that would alter or negatively impact biological resources or jurisdictional waters. The Proposed Project would not impact special status species, wildlife corridors, or critical habitat.

Thresholds of Significance

Established significance thresholds from the USFWS or the National Marine Fisheries Service determine if the Project would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or if it would result in the destruction or adverse modification of federally designated habitat. No significance threshold is established for non-listed species.

No Project Alternative

Under the No Project Alternative, no WWTP would be developed, and no sewer infrastructure would be developed within Districts A, B, or C. The existing on-site individual septic sewer systems within the Proposed Project area would remain and no change would occur. The remaining septic tanks could directly lead to negative environmental effects due to tank leakage.

Proposed Project

Threatened and Endangered Species, Wildlife Corridors, and Migratory Birds

Vegetation Communities

There are approximately 224.54 acres of native vegetation communities and 357.04 acres of other land cover types within the Survey Area. A total of 13.86 acres of wetland vegetation are present within the Survey Area and are potentially under the jurisdiction of the USACE; wetland vegetation is dominated by California Sycamore – Coast Live Oak Riparian Woodland and Gooddings Willow – Red Will Riparian Woodland.

Construction activities as part of the Proposed Project are not anticipated to result in adverse impacts to vegetation communities. However, mitigation measures have been identified to ensure that potential impacts that may occur are reduced. As such, the Proposed Project would have a less than significant impact on vegetation communities with the implementation of mitigation measures.

Of the nine special status plant species identified in the literature review, it was determined that four special status plant species were considered absent from the Survey Area, one species has a low Potential for Occurrence (PFO), and four species have a moderate PFO. The four special status plant species with a moderate PFO include: Nevin's barberry, San Diego ambrosia, San Diego thorn-mint, and thread-leaved brodiaea. Although these special status plant species have low to moderate PFO within the Proposed Project area, mitigation measures have been identified to reduce potential impacts, such that these plant species are encountered during construction activities. As such, the Proposed Project would have a less than a significant impact to special status plant species with the implementation of mitigation measures.

Wildlife

Of the 10 special status wildlife species identified in the literature review, it was determined that six special status wildlife species were considered absent from the Survey Area, three species have a low PFO, and one species have a moderate PFO. Pre-construction surveys for special status species with a PFO within the Survey Area are recommended prior to the initiation of construction. As such, the Proposed Project would have a less than significant impacts to special status wildlife species with the implementation of mitigation measures.

To avoid impacts to nesting birds that are protected under the Migratory Bird Treaty Act (MBTA), construction should be conducted outside of the nesting season (generally September 1 through January. If construction outside the breeding season is not feasible, pre-construction nesting bird surveys should be conducted during the nesting season (generally January 15 through August 31) at least 10 days prior to construction near suitable nesting habitat. As such, with the implementation of pre-construction nesting bird surveys, the Proposed Project would have a less than significant impact to migratory bird species.

The IHS completed informal consultation with the USFWS to discuss requirements under Section 7 of the ESA of 1973, as amended. The USFWS requested that focus surveys be conducted for coastal California gnatcatcher and least Bell's vireo, which Chambers Group completed during the 2025 breeding season and results were negative. The IHS subsequently made a No Effect determination and notified the USFWS of their determination. IHS and USFWS informal consultation correspondence is provided in **Appendix E**.

Mitigation Measures

MM BIO-1 The Proposed Project shall be designed to utilize existing developed areas including roads, bare ground, and disturbed areas to the greatest extent possible to avoid impacts to native vegetation communities. However, impact to native habitat could still occur. To minimize impacts to native vegetation, biological monitoring is recommended around all active construction areas, inclusive of the WWTP and any undeveloped work areas to ensure activities are limited to designated temporary and permanent impact areas.

MM BIO-2 Prior to construction, exclusionary wildlife fencing shall be placed around all active construction areas that contain sensitive habitat areas, inclusive of the WWTP and any undeveloped work areas to avoid impacts. Daily pre-construction sweeps within the exclusionary fencing by a qualified biologist would be implemented prior to the commencement of construction activities.

MM BIO-3 To avoid impacts to nesting birds that are protected by the Migratory Bird Treaty Act (MBTA), construction would be conducted outside of nesting season (generally September 1 through January 14). If construction outside the breeding season is not feasible, pre-construction nesting bird surveys shall be conducted during the nesting season (generally January 15 through August 31) at least 10 days prior to construction near suitable nesting habitat.

MM BIO-4 Nesting bird surveys shall be conducted within 150 feet for non-listed passerines, 300 feet for special status passerines, and 500 feet for raptors around all active construction areas, inclusive of the WWTP and any undeveloped work areas. If an active nest is found of a non-special status species, an appropriate no-work buffer shall be established around the nest by a qualified biologist that takes into account the species, ambient disturbance, perceived tolerance to disturbance of the nest, and planned construction activities including potential direct and indirect impacts (e.g., noise and vibration from construction activities). Nest buffers shall be established with stakes, flagging, and signage as appropriate to ensure construction personnel do not enter the buffer. Drive-through-only or walk-through-only buffers may be established if a qualified biologist determines that the nest would not be affected by such activities past an active nest.

MM BIO-5 For special status species that are not listed, a 300-foot buffer shall be established for special status passerines and a 500-foot buffer shall be established for special status raptors around all active construction areas, inclusive of the WWTP and any undeveloped work areas. If a listed avian species establishes an active nest during construction, a 500-foot buffer would be established and USFWS shall be notified. Buffer reductions for special status species may be possible on a case-by-case basis if the nest shows a high tolerance to disturbance through coordination with USFWS. Nest buffers shall be established with stakes, flagging, and signage as appropriate to ensure construction personnel do not enter the buffer. Drive-through-only or walk-through-only buffers may be established if a qualified biologist determines that the nest would not be affected by such activities past an active nest.

5.1.4 Air Quality

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not alter existing conditions. The No Project Alternative would not change emissions from existing levels.
Proposed Project	The Proposed Project's short-term construction and long-term operational criteria pollutant emissions would not exceed the General Conformity de minimis threshold levels or SDAPCD's thresholds. The substantiation for the determination of below de minimis thresholds emissions is detailed in ***Table 5.1: Operational Emissions*** and ***Table 5.2: Construction-Related Emissions*,** below which show estimated Project emissions for each criteria pollutant during both long term operations and short term construction periods. Additionally, carcinogenic and non-carcinogenic hazards were calculated to be within acceptable limits with implementation of **MM AQ-1**. Therefore, the Proposed Project would not result in air quality impacts.

No Project Alternative

Under the No Project Alternative, no WWTP would be developed, and no sewer nor recycled water infrastructure would be developed within Districts A, B, or C. The existing individual septic sewer systems within the Proposed Project area would remain and no change would occur. As such, construction activities would not occur, and associated emissions would not be generated.

Proposed Project

Section 176(c)(1) of 40 CFR Part 93, Subpart B of the CAA requires that the federal government not engage in, support, or provide financial assistance for licensing, permitting, or approving any activity not conforming to an approved CAA implementation plan. The approved implementation plan could be a federal, state, or tribal implementation plan. Compliance with the General Conformity Rule is based on a comparison of the changes in air emissions (Proposed Project minus the No Project Alternative) with the de minimis thresholds. The de minimis thresholds are based on the regional status/designation of San Diego County relative to the National Ambient Air Quality Standards (NAAQS). Because the Proposed Project site is located within the SDAPCD and because the Band does not have an approved Tribal Implementation Plan, to conform with the SIP, the Proposed Project must comply with the SDAPCD's Regional Air Quality Strategy (RAQS).

San Diego County is designated severe nonattainment for ozone (O_3), moderate maintenance for carbon monoxide (CO), unclassifiable[1] for coarse particulate matter (PM_{10}), and attainment for all other criteria pollutants.[2] The applicable de minimis threshold for PM_{10} designated as unclassifiable (assumed serious nonattainment as worst case) is 70 tons per year and CO designated as moderate maintenance is 100 tons per year. Additionally, de minimis thresholds for O_3 severe nonattainment are 25 tons per year for volatile organic compounds (VOCs) and nitrogen oxides (NO_X) (the two primary precursors to O_3 formation). The de minimis thresholds for all other pollutants designated as Attainment/Maintenance is 100 tons per year.

Cancer risk with an incidence rate of 10 persons per million is the generally maximum acceptable incremental cancer risk due to toxic air contaminant (TAC) exposure.[3] In addition to carcinogenic risk, noncarcinogenic risks are quantified by calculating a "hazard index," (HI) expressed as the ratio between the ambient pollutant concentration and its toxicity or Reference Exposure Level (REL). An REL is a concentration at, or below which health effects are not likely to occur. A hazard index of less than 1.0 means that adverse health effects are not expected. Within this analysis, non-carcinogenic exposures of less than 1.0 are considered less than significant.

The Proposed Project's operational emissions would be associated with area sources, energy sources, mobile sources, and backup generators. Long-term operational emissions attributable to the Proposed Project are summarized in ***Table 5.1: Operational Emissions***. The operational emissions sources are described below.

- *Area Source Emissions*. Area source emissions would be generated due to WTTP VOCs and architectural coatings.
- *Energy Source Emissions*. Energy source emissions are typically generated from natural gas usage. However, the Proposed Project would not consume natural gas. Although the Proposed Project would consume electricity (i.e., lift stations, pumps, e-one grinder pumps, and WWTP operations), electricity emissions do not emit criteria pollutants.
- *Mobile Source Emissions*. Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. The Proposed Project is estimated to produce 2.8 tons per month of biosolids and would require one truck hauling trip per month to the Arizona Soils Composting Facility, located approximately 250 miles from the Proposed Project site. The WWTP would employ approximately five on-site workers and therefore would generate 15 daily vehicle trips.
- *Emergency Backup Generators.* The Proposed Project would include one WWTP backup generator (750 horsepower [hp]) and six lift station backup generators (one at each lift station; 400 hp). Emergency backup generators must meet SDAPCD's Best Available Control Technology (BACT) requirements and comply applicable SDAPCD rules related to generators, which would minimize emissions.

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1 The area is designated as unclassifiable if the available data does not support a designation of attainment or nonattainment. Therefore, this analysis uses the lowest de minimis threshold (i.e., serious nonattainment) for PM_{10}.

2 United States Environmental Protection Agency, *Nonattainment Areas for Criteria Pollutants (Green Book)*, https://www.epa.gov/green-book, accessed April 2024.
San Diego County Air Pollution Control District, *Attainment Status*, https://www.sdapcd.org/content/sdapcd/planning/attainment-status.html, accessed April 2024.

3 San Diego County Air Pollution Control District, *Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs)*, July 2022.

Table 5.1: Operational Emissions

Emission Source	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	(lbs/day)						(tons/year)					
Area Source Emissions[1]	1.03	0.00	0.45	0.00	0.00	0.00	0.18	0.00	0.04	0.00	0.00	0.00
Energy Emissions[2]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile Emissions[3]	0.05	0.05	0.55	0.00	0.17	0.04	0.01	0.01	0.09	0.00	0.03	0.01
Backup Generators[4]	7.08	22.62	18.06	0.03	1.04	1.04	0.18	0.57	0.45	0.00	0.03	0.03
Total Proposed Project Emissions	**8.17**	**22.67**	**19.06**	**0.04**	**1.21**	**1.09**	**0.37**	**0.57**	**0.58**	**0.00**	**0.06**	**0.04**
SDAPCD Regional Thresholds	*55*	*250*	*550*	*250*	*100*	*55*	-	-	-	-	-	-
Federal De Minimis Level [5]	-	-	-	-	-	-	*25*	*25*	*100*	*N/A*	*70*	*N/A*
Threshold Exceeded	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**N/A**	**No**	**N/A**

VOCs = Volatile Organic Compounds; NO_X = Nitrogen Oxides; CO = Carbon Monoxide; SO_2 = Sulfur Dioxide; PM_{10} = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less; - = not applicable

Notes:

1. VOC emissions from the WWTP are estimated using Mojave Desert Air Quality Management District's default emission factors for membrane bioreactor (MBR) processes available at: http://www.mdaqmd.ca.gov/home/showdocument?id=790
2. The WWTP is defined as a General Light Industry land use in CalEEMod. However, the WWTP is not expected to have any energy emissions from natural gas. Therefore, the energy emission values in the CalEEMod outputs are not included in this table.
3. Mobile emissions from biosolid hauling truck trips assumed a roundtrip distance of 500 miles to the Arizona Soils Compositing Facility once per month. As the WWTP would employ five on-site employees, mobile emissions include 15 daily trips from employees.
4. The Proposed Project would include one backup generator at the WWTP (assumed to be 750 horsepower [hp], operating 50 hours per year) and six backup generators at the lift stations (one at each lift station; assumed to be 400 hp, operating 50 hours per year).
5. *De minimis* levels are established within Title 40 of the Code of Federal Regulations, Section 93.153 (40 CFR 93.153). The Proposed Project is located within the San Diego County portion of the San Diego Air Basin, which is federally designated as severe nonattainment for O_3, moderate maintenance for CO, and unclassifiable for PM_{10}.

Source: Refer to the CalEEMod outputs provided in **Appendix F** of this EA.

As indicated in ***Table 5.1***, implementation of the Proposed Project would not exceed applicable federal general conformity de minimis levels. Additionally, the Proposed Project would not exceed SDAPCD thresholds. Therefore, the Proposed Project would conform with SDAPCD's RAQS because the Proposed Project would not exceed SDAPCD thresholds. A less than significant impact would occur.

Construction activities are expected to begin in 2026 and occur over approximately 9.5 years. Construction emissions occur mostly as exhaust products from the operation of construction equipment and vehicles but can also occur as fugitive dust emissions from land disturbance during earth-moving activities. Short-term construction would result in increased O_3-precursor (i.e., VOCs and NO_X) and particulate matter ($_{PM2.5}$ and $_{PM10}$) emissions.

As shown in ***Table 5.2: Construction-Related Emissions***, all short-term construction criteria pollutant emissions would remain below their respective thresholds. Therefore, construction activities associated with the Proposed Project would not expose sensitive receptors to substantial pollutant concentrations.

Table 5.2: Construction-Related Emissions

Construction Year	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
	(lbs/day)						(tons/year)					
2025	8.57	79.31	80.71	0.13	43.65	23.56	0.87	8.02	8.59	0.01	3.50	1.91
2026	6.01	54.34	61.29	0.11	22.70	12.35	0.38	3.42	4.03	0.01	1.05	0.58
2027	3.36	30.72	33.83	0.06	14.51	7.92	0.29	2.54	2.94	0.01	0.98	0.54
2028	3.29	29.82	33.86	0.06	14.44	7.86	0.30	2.68	2.98	0.01	1.41	0.76
2029	4.31	37.19	48.04	0.08	15.04	8.14	0.56	4.85	6.24	0.01	1.96	1.06
2030	4.20	36.21	47.96	0.08	14.98	8.09	0.28	2.28	2.99	0.01	0.98	0.53
2031	3.07	26.84	33.48	0.06	14.37	7.74	0.40	3.50	4.37	0.01	1.88	1.01
2032	2.93	25.18	31.97	0.06	14.27	7.65	0.19	1.65	2.08	0.00	0.94	0.50
2033	2.84	24.04	30.96	0.06	14.12	7.56	0.37	3.14	4.04	0.01	1.84	0.99
2034	2.78	23.46	30.74	0.06	14.07	7.52	0.07	0.56	0.67	0.00	0.45	0.24
Maximum	**8.57**	**79.31**	**80.71**	**0.13**	**43.65**	**23.56**	**0.87**	**8.02**	**8.59**	**0.01**	**3.50**	**1.91**
SDAPCD Regional Thresholds	*137*	*250*	*550*	*250*	*100*	*55*	-	-	-	-	-	-
de minimis Thresholds[1]	-	-	-	-	-	-	*25*	*25*	*100*	*N/A*	*70*	*N/A*
Threshold Exceeded	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**N/A**	**No**	**N/A**

VOC = Volatile Organic Compounds; NO_X = Nitrogen Oxides; CO = Carbon Monoxide; SO_2 = Sulfur Dioxide; PM_{10} = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

Notes:
1. *De minimis* levels are established within Title 40 of the Code of Federal Regulations, Section 93.153 (40 CFR 93.153). The Proposed Project is located within the San Diego County portion of the San Diego Air Basin, which is federally designated as severe nonattainment for O_3, moderate maintenance for CO, and unclassifiable for PM_{10}.

Source: Refer to the modeling assumptions and CalEEMod outputs provided in **Appendix F** of this EA.

Health Risk Assessment

A construction and operational HRA was prepared for the Proposed Project by Kimley-Horn. The Proposed Project includes a WWTP, which would be a source of TACs such as benzene, chloroform, 1,4-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, trichloroethylene, Xylenes (m,o,p-isomers), ammonia, 1,1,1-trichloroethane, and toluene. Additionally, diesel particulate matter (DPM) emissions would be emitted from construction hauling trucks and equipment, as well as WWTP biosolid hauling trucks and backup generators during operations.

Construction Sources

Construction is proposed to occur over approximately 9.5 years, beginning in June 2026. For construction activity, DPM is the primary TAC of concern. Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. The use of diesel-powered construction equipment would be episodic and would occur throughout the Proposed Project site. Furthermore, even during the most intense period of construction, DPM emissions would be generated from different locations on the Proposed Project site rather than in a single location because different types of construction activities (e.g., WWTP construction and gravity pipeline construction) would not occur at the same place at the same time.

Operational Sources

WWTP Toxic Air Contaminants (TACs). WWTP process VOCs were assumed to include a variety of speciated compounds associated with treatment of wastewater from residential and commercial uses. All VOCs were conservatively assumed to speciate into TACs.

Biosolids Hauling Truck Trips. The Proposed Project is estimated to produce 2.8 tons per month of biosolids and would require one truck hauling trip per month to the Arizona Soils Composting Facility, located approximately 250 miles from the Proposed Project site, or 500 miles roundtrip.

Emergency Backup Generators. The Proposed Project would include one WWTP backup generator (750 hp) and six lift station backup generators (one at each lift station; 400 hp).

Carcinogenic Risk Assessment

Table 5.3: Carcinogenic Risk Assessment shows the health risk for the following scenarios: construction, operation, and combined construction and operation of the Proposed Project. As shown in ***Table 5.3***, the maximum unmitigated construction risk at residential, worker, and student receptors would be 19.90, 0.11, and 1.35 in one million, respectively. Additionally, the maximum unmitigated operational cancer risk at residential, worker, and student receptors would be 4.66, 0.28, and 1.73 in one million, respectively. Further, the unmitigated combined construction and operational cancer risk at residential, worker, and student receptors would be 20.92, 0.60, and 3.08 in one million, respectively. Therefore, the maximum unmitigated construction cancer risk and unmitigated combined construction and operational cancer risk would exceed the SDAPCD threshold of 10 in one million. The Proposed Project would implement **MM AQ-1** to reduce cancer risk, which requires Tier 4 construction equipment.

Implementation of **MM AQ-1** would reduce cancer risk from operations to below the SDAPCD's 10 in one million threshold; refer to ***Table 5.3***. With **MM AQ-1** incorporated, the maximum construction cancer risk would be reduced to 5.63 in one million for residential receptors, 0.03 in one million for worker receptors, and 0.36 in one million for student receptors. Further, the maximum combined construction and operational cancer risk would be reduced to 9.17 in one million for residential receptors, 0.56 in one million for worker receptors, and 2.09 in one million for student receptors. Therefore, the Proposed Project's cancer risk would not exceed the SDAPCD's 10 in one million threshold and impacts associated with carcinogenic risk would be less than significant.

Table 5.3: Carcinogenic Risk Assessment

Exposure Scenario		Cancer Risk (per Million)[1,2]		Significance Threshold (per Million)	Mitigated Risk Exceeds Threshold?
		Without Mitigation	With Mitigation		
Construction					
Residential Receptors	Single-Family Residential (Along Peart Road)	19.90	5.63	10	No
	Single-Family Residential (Along Oos Place)	7.14	1.95	10	No
	Single-Family Residential (Along Eshash Road)	6.38	1.76	10	No
Worker Receptors	Two Paws Up Happy Camp for Dogs	0.11	0.03	10	No
	Caspian Stables	0.08	0.02	10	No
	Fluegge Egg Ranch	0.06	0.01	10	No
Student	San Pasqual Playground/Baseball Field	1.35	0.36	10	No
Operations					
Residential Receptors	Single-Family Residential (Along Peart Road)	4.66	4.66	10	No
	Single-Family Residential (Along Oos Place)	1.65	1.65	10	No
	Single-Family Residential (Along Eshash Road)	0.73	0.73	10	No
Worker Receptors	Two Paws Up Happy Camp for Dogs	0.03	0.03	10	No
	Caspian Stables	0.04	0.04	10	No
	Fluegge Egg Ranch	0.28	0.28	10	No

Exposure Scenario		Cancer Risk (per Million)[1,2]		Significance Threshold (per Million)	Mitigated Risk Exceeds Threshold?
		Without Mitigation	With Mitigation		
Student	San Pasqual Playground/Baseball Field	1.73	1.73	10	No
Construction and Operations Combined					
Residential Receptors	Single-Family Residential (Along Peart Road)	20.92	9.17	10	No
	Single-Family Residential (Along Oos Place)	7.46	3.19	10	No
	Single-Family Residential (Along Eshash Road)	5.84	2.04	10	No
Worker Receptors	Two Paws Up Happy Camp for Dogs	0.15	0.07	10	No
	Caspian Stables	0.14	0.08	10	No
	Fluegge Egg Ranch	0.60	0.56	10	No
Student	San Pasqual Playground/Baseball Field	3.08	2.09	10	No

NA = Not Applicable
1. The reported annual pollutant concentrations are at the closest maximally exposed individual residents to the Proposed Project site.
2. The "With Mitigation" exposure scenario shows the risk with the incorporation of **MM AQ-1** (Tier 4 construction equipment).

Source: Refer to the modeling assumptions and outputs provided in **Appendix F** of this EA.

Noncarcinogenic Risk Assessment

Unmitigated acute and chronic impacts were also evaluated and shown in ***Table 5.4: Noncarcinogenic Risk Assessment***. An acute or chronic hazard index of 1.0 is considered individually significant. The highest maximum chronic and acute hazard index from the Proposed Project would be 0.04582 and 0.16177, respectively. Therefore, carcinogenic and non-carcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

Table 5.4: Noncarcinogenic Risk Assessment

Exposure Scenario		Chronic Hazard[1,2]	Acute Hazard[1,2]
Construction			
Residential Receptors	Single-Family Residential (Along Peart Road)	0.00973	NA
	Single-Family Residential (Along Oos Place)	0.00349	NA
	Single-Family Residential (Along Eshash Road)	0.00312	NA
Worker Receptors	Two Paws Up Happy Camp for Dogs	0.00092	NA
	Caspian Stables	0.00068	NA
	Fluegge Egg Ranch	0.00047	NA
Student	San Pasqual Playground/Baseball Field	0.00191	NA
Operation			
Residential Receptors	Single-Family Residential (Along Peart Road)	0.02746	0.16177
	Single-Family Residential (Along Oos Place)	0.00952	0.10708
	Single-Family Residential (Along Eshash Road)	0.00337	0.07682

Exposure Scenario		Chronic Hazard[1,2]	Acute Hazard[1,2]
Worker Receptors	Two Paws Up Happy Camp for Dogs	0.00103	0.03562
	Caspian Stables	0.00170	0.02638
	Fluegge Egg Ranch	0.01630	0.03105
Student	San Pasqual Playground/Baseball Field	0.04582	0.06348
	SDAPCD Threshold	*1.0*	*1.0*
	Threshold Exceeded?	No	No
1. The reported pollutant concentration used to calculate the chronic and acute hazard is at the closest receptor (maximally exposed individual receptor). Pollutant concentrations can be found in **Appendix F**. 2. DPM is the primary TAC occurring during construction. There is no acute REL for DPM and acute health risk cannot be calculated. The Acute hazard would occur from WWTP VOCs and is calculated using RELs from OEHHA.			
Source: Refer to **Appendix F**.			

Mitigation Measures

MM AQ-1: Prior to the issuance of grading permits, the Band Engineer shall confirm that the Grading Plan and Building Plans and Specifications require all construction contractors to incorporate the following measure to minimize construction emissions.

- All off-road diesel-powered construction equipment greater than 50 horsepower meets California Air Resources Board Tier 4 Final off-road emissions standards or incorporate CARB Level 3 Verified Diesel Emission Control Strategy (VDECS). Requirements for Tier 4 Final equipment and the option for Level 3 VDECS shall be included in applicable bid documents and successful contractor(s) must demonstrate the ability to supply such equipment. A copy of each unit's Best Available Control Technology (BACT) documentation (certified tier specification or model year specification), and CARB or SDAPCD operating permit (if applicable) shall be provided to the Band at the time of mobilization of each applicable unit of equipment. This equipment shall be used when commercial models that meet the construction needs of the proposed project are commercially available from local suppliers/vendors. The determination of commercial availability of such equipment shall be made by the Band, based on applicant-provided evidence from expert sources, such as construction contractors in the region.

5.1.5 Greenhouse Gases

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not alter existing conditions. The No Project Alternative would not change emissions from existing levels.
Proposed Project	The Proposed Project's short-term construction and long-term operational GHG emissions would not result in any significant impacts or interfere with the State's ability to achieve GHG reduction targets. Therefore, there would be no adverse effect to GHG resulting from the Proposed Project.

No Project Alternative

No construction activities would occur under the No Project Alternative; therefore, the No Project Alternative would not change GHG emissions from existing levels.

Under the No Project Alternative, the Proposed Project site would be maintained in its current condition with the existing wastewater treatment facilities. The Proposed Project WWTP and associated facilities would not be constructed. As a result, there would be no change to the existing environmental conditions and the No Project Alternative would not change GHG emissions from existing levels.

Proposed Project

The Proposed Project's operational GHG emissions would be generated by area sources, energy sources, mobile sources, backup generators, and solid waste. These emissions categories are discussed above in Section 5.1.4, Air Quality.

GHG emissions associated with the Proposed Project are summarized in ***Table 5.5: Proposed Project Operational GHG Emissions***. As shown in ***Table 5.5***, operational GHG emissions would be approximately 206.44 $MTCO_2e$ annually from operations.

Table 5.5: Proposed Project Operational GHG Emission

Emissions Source	$MTCO_2e$ per Year
Area Source	0.15
Energy[1,2]	92.27
Mobile Sources[3]	27.87
Backup Generators[4]	82.16
Waste	3.99
Total	***206.44***

$MTCO_2e$ = metric tons carbon dioxide equivalent

1. Energy source emissions would be generated from lift station pumps, E-One Grinder pumps, and WWTP operations electricity consumption.
2. The WWTP is defined as a General Light Industry land use in CalEEMod. However, the WWTP is not expected to have any energy emissions from natural gas. Additionally, any wastewater generated from employees at the WWTP would be treated on-site. Therefore, electricity emissions associated with on-site wastewater generation and natural gas shown in the CalEEMod outputs are not included in this table.
3. Mobile emissions from biosolid hauling truck trips assumed a roundtrip distance of 500 miles to the Arizona Soils Compositing Facility once per month. As the WWTP would employ five on-site employees, mobile emissions include 15 daily trips from employees.
4. The Proposed Project would include one backup generator at the WWTP (assumed to be 750 horsepower [hp], operating 50 hours per year) and six backup generators at the lift stations (one at each lift station; assumed to be 400 hp, operating 50 hours per year).

Source: CalEEMod version 2022.1 Refer to **Appendix F** for model outputs.

As shown in ***Table 5.5***, the Proposed Project would generate nominal GHG emissions and would not result in any significant impacts or interfere with the State's ability to achieve GHG reduction targets. Therefore, there would be no adverse effect to GHG resulting from the Proposed Project.

Construction activities are expected to begin in 2025 and occur over approximately 9.5 years. The approximate quantity of annual GHG emissions generated by construction activities is shown in ***Table 5.6: Proposed Project Construction GHG Emissions.***

Table 5.6: Proposed Project Construction GHG Emissions

Emissions Source	$MTCO_2e$ per Year
2025	1,466.95
2026	724.64
2027	510.60
2028	523.02
2029	1,106.20
2030	538.85
2031	781.03
2032	392.91
2033	764.56
2034	130.64
$MTCO_2e$ = metric tons carbon dioxide equivalent	

Mitigation Measures

None required.

5.1.6 Noise

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not alter existing conditions. The No Project Alternative would not change noise levels from existing ambient conditions.
Proposed Project	Short-term construction and long-term operational noise levels from the Proposed Project would not result in a temporary or permanent substantial noise increase with implementation of **MM N-1**. Therefore, the Proposed Project would result in less than significant noise impacts.

Construction

A construction noise impact would occur if construction noise levels from the Proposed Project exceed 75 dBA $L_{eq}(_{12\text{-hour}})$ at any off-site sensitive receptors.[4]

Operations

An operational noise impact would occur if operational noise levels from the Proposed Project would result in an increase in ambient noise levels of 5 dBA or more at any sensitive receptors. On-site operational noise levels from stationary sources were calculated based on a standard noise attenuation rate of 6 dB per doubling of distance. Operational noise is evaluated based on the substantial increase criterion of 5 dBA compared to ambient conditions.

[4] This analysis conservatively uses the County of San Diego's construction noise threshold of 75 dBA $L_{eq(12\text{-hour})}$ (7:00 a.m. to 7:00 p.m.) at off-site receptors to evaluate construction noise impacts.

Vibration

In accordance with the FTA guidelines and Caltrans Guidance Manual, vibration impacts would occur if the Proposed Project would generate vibration levels exceeding 0.20 in/sec PPV for building damage and/or 0.4 in/sec PPV for human annoyance.

No Project Alternative

No construction activities would occur under the No Project Alternative; therefore, the No Project Alternative would not result in temporary construction noise impacts. Under the No Project Alternative, the site would be maintained in its current condition with the existing wastewater treatment facilities. The proposed WWTP and associated facilities would not be constructed. As a result, there would be no change to the existing environmental conditions and the No Project Alternative would not create new sources of operational noise.

Proposed Project

Operational Impacts

The WWTP would include two blowers for the membrane bioreactor (MBR) located in the northeastern portion of the WWTP site, directly south of the proposed WWTP structures. These blowers create noise levels up to approximately 80 dBA at a distance of 5 feet.[5] In addition, the WWTP and each lift station in the Proposed Project area would include a backup generator that generates noise levels up to approximately 68 dBA at 10 feet.[6] Using these reference levels, stationary source noise levels were calculated at the nearest sensitive receptors based on the inverse square law for sound propagation (a 6 dBA reduction for a doubling of distance) and were compared to the measured ambient noise levels in the area; see ***Table 5.7: Stationary Source Noise Levels***.

Table 5.7: Stationary Source Noise Levels

Source	Reference Noise Level (dBA)	Reference Noise Level Distance	Distance to Nearest Sensitive Receptor[3]	Noise Level at Receptor (dBA)	Measured Ambient Noise Level (dBA L_{eq})[4]	Ambient + Proposed Project Noise Level (dBA)	Increase	Exceeds 5 dBA?
Wastewater Treatment Plant								
Blowers (2)	85[1]	5	430	46.3	57.9	58.2	0.3	No
Emergency Generator	68[2]	10	355	37.0	57.9	57.9	0.0	No
Lift Stations								
Emergency Generator (A1)	68[2]	10	100	48.0	50.0	52.1	2.1	No
Emergency Generator (A2)	68[2]	10	160	43.9	57.5	57.7	0.2	No
Emergency Generator (B1)	68[2]	10	260	39.7	57.9	58.0	0.1	No
Emergency Generator (B2)	68[2]	10	60	52.4	63.9	64.2	0.3	No
Emergency Generator (B3)	68[2]	10	290	38.8	45.9	46.7	0.8	No
Emergency Generator (C1)	68[2]	10	50	54.0	45.9	54.6	8.7	**Yes**

Notes:
1. Blower reference noise level provided by Cloacina on February 26, 2024.
2. Cummins Inc., *Commercial Mobile Generator Specification Sheet, ONAN SD 10.0 60Hz/8.0 50hZ*, 2021. Reference noise level assumes a minimum noise reduction on 10 dBA from enclosure structure.
3. Distance measured from noise source to residential dwelling in Google Earth.
4. Measured noise levels are provided in ***Table 3-7.1***.

As seen in ***Table 5.7***, the Proposed Project's stationary source noise levels would not exceed the measured ambient noise level by 5 dBA at the nearest sensitive receptors, apart from emergency generator C1 which would result in a noise level increase of 8.7 dBA. However, backup generators would only be used for testing and in emergency

[5] E-mail correspondence with Cloacina on February 26, 2024.
[6] Cummins Inc., *Commercial Mobile Generator Specification Sheet, ONAN SD 10.0 60Hz/8.0 50hZ*, 2021. Reference noise level assumes a minimum noise reduction on 10 dBA from enclosure structure.

situations and would generate noise that is short-term in nature and not for extended periods of time. As such, emergency generator noise would not result in a long-term, permanent noise level increase of 5 dBA over ambient conditions, and a less than significant impact would occur in this regard.

It is also noted that the Proposed Project would include the operation of several E-One Grinder pumps and lift station pumps throughout the Proposed Project site for water conveyance. However, the proposed pumps would produce negligible noise and would not be perceptible at any nearby receptors.

Construction Impacts

Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels at intermittent periods. During construction, exterior noise levels could affect sensitive receptors surrounding the construction site.

Construction would occur in five phases: Phase 1 (WWTP and District A Northern Improvements), Phase 2 (District A Southern Improvements), Phase 3 (WWTP Expansion and District B Northern Improvements), Phase 4 (District B Southern Improvements), and Phase 5 (District C Improvements). Typical operating cycles for heavy construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Typical noise levels associated with individual construction equipment are listed in ***Table 5.8: Typical Construction Noise Levels***. As indicated in ***Table 5.8***, sensitive receptors can be exposed to high noise levels when located near active construction equipment. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose.

Figure 4-7-1a through 4-7.1e: Construction Noise Impact Zone by Phase in **Appendix G** of this EA shows the noise impact zone for each phase that exceeds the 75 dBA $L_{eq(12\text{-hour})}$ noise threshold. As indicated in Figures 4-7-1a through 4-7.1e of **Appendix G** of this EA, several residential uses are located within the noise impact zone. Thus, a minor adverse short-term noise impact would occur as a result of Proposed Project construction activities. Implementation of **MM N-1** (Construction Noise Control Plan) would minimize temporary construction noise impacts to the extent feasible.

Vibration Impacts

Construction on the Proposed Project site would have the potential to result in varying degrees of temporary ground-borne vibration, depending on the specific construction equipment used and the operations involved.

In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts include human annoyance and building damage. The FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 5.8: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 50 feet for typical construction equipment. As indicated in ***Table 5.8***, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Proposed Project construction range from 0.003 to 0.210 in/sec PPV at 25 feet from the source of activity.

Table 5.8: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 50 Feet (in/sec)[1]
Vibratory Roller	0.210	0.032
Large Bulldozer/Caisson Drilling	0.089	0.032
Loaded Trucks	0.076	0.027
Jackhammer	0.035	0.012
Small Bulldozer/Tractors	0.003	0.001
Notes: 1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.		

The nearest off-site structure (residential dwelling) is located approximately 50 feet from Proposed Project construction activities. ***Table 5.8*** shows that at 50 feet, the vibration velocities from construction equipment would be a maximum of 0.032 in/sec PPV, which is below the FTA's 0.20 in/sec PPV threshold for building damage and below the 0.4 in/sec PPV annoyance threshold. Therefore, vibration impacts associated with Proposed Project construction would be less than significant.

It is also noted the Proposed Project would not be a source of long-term operational vibration, and therefore, operational vibration impacts would be less than significant.

Mitigation Measures

MM N-1 **Construction Noise Control Plan**. The Proposed Project shall prepare and implement a Construction Noise Logistics Plan for all construction activities that includes, at a minimum, the following measures:

- Prohibit unnecessary idling of internal combustion engines. Post signs at gates and other places where vehicles may congregate reminding operators of the State's Airborne Toxic Control Measure (ATCM) limiting idling to no more than 5 minutes.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers' radios to a point where they are not audible at existing residences bordering the Proposed Project site.
- Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other State required noise attenuation devices.
- Property owners and occupants located within the noise impact zones identified in ***Figures 4-7.1a*** through ***4-7.1e*** shall be sent a notice, at least 15 days prior to commencement of construction activities, regarding the construction schedule of the Proposed Project. A sign, legible at 50 feet shall also be posted at the Proposed Project construction site indicating the dates and duration of construction activities, as well as provide a contact name and a telephone number for the Noise Disturbance Coordinator where residents can inquire about the construction process and register complaints.
- Prior to issuance of any grading or construction permit, the Contractor shall provide evidence that at all times during construction activities and on-site construction staff member will be designated as a Noise Disturbance Coordinator. The Noise Disturbance Coordinator is responsible for responding to complaints about construction noise. When a complaint is received, the Noise Disturbance Coordinator shall determine the cause (e.g., starting too early, bad muffler, etc.), implement reasonable measures to resolve the

complaint, and document actions taken. All notices sent to residential units within the noise impact zone and all signs posted at the construction site, shall include the telephone number for the Coordinator, as well as a description of the Coordinators specified roles and responsibilities at the construction site. Additionally, a log of noise complaints and responses shall be maintained and made available upon request.

- Electrical power will be used to run air compressors and similar power tools and to power any temporary structures, such as construction trailers or security staff facilities.

MM N-2 For all noise-generating construction activities, additional noise attenuation techniques would be employed as necessary to reduce noise levels. Such techniques could include, but are not limited to, the use of sound blankets, noise shrouds and temporary sound barriers between construction areas and nearby sensitive receptors as specified in the noise control plan.

5.1.7 Land Use

Overview of Impacts

Alternative	Impacts
No Project Alternative	No land modifications would occur under the No Project Alternative and impacts to land uses would not occur.
Proposed Project	The Proposed Project would not generate significant impacts to land use as the proposed development would remain generally consistent with existing uses except for a single previously vacant property, where the WWTP site is proposed.

No Project Alternative

Under the No Project Alternative, no development would occur, and the current uses would remain as they are.

Proposed Project

Land uses would not be modified due to the sewer line or recycled water line construction for the Proposed Project. Construction of the WWTP would necessitate the redevelopment of an abandoned residential site. The Proposed Project would not reduce or remove residences. Impacts due to land use modifications would be less than significant.

Mitigation Measures

None required.

5.1.8 Historical, Architectural, Archeological, and Cultural Resources

Overview of Impacts

Alternative	Impacts
No Project Alternative	No impacts would occur as the Proposed Project site would continue in an unaltered state.
Proposed Project	Impacts to historic properties may occur during construction activities and should be mitigated to reduce effects to less than significant levels and to avoid an adverse effect.

No Project Alternative

Under the No Project Alternative, the lands within the Proposed Project area would remain unaltered. As such, any potential historical resources below the surface would remain untouched and in-situ.

Proposed Project

The results of the research and fieldwork conducted for the Historic Property Inventory (HPI) indicate that the bulk of the Area of Potential Effect (APE) is highly sensitive for buried and surface archaeological resources (see **Appendix H**). As a result of the above research and field efforts, a total of 23 archaeological resources were identified within the APE for the undertaking, including four (4) prehistoric isolates, 16 prehistoric archaeological sites, one (1) multicomponent archaeological site, and two (2) historic built environment resources. Furthermore, an additional 100 historic properties were identified within 1-mile of the APE, the majority of which are prehistoric archaeological resources. While these resources are located outside of the APE and, as such, will not be impacted as a result of the undertaking, their proximity to the APE indicates a broad archaeological sensitivity of the area beyond just the APE and further underlines the archaeological sensitivity of the APE itself. Consultation with the Tribal Historic Preservation Officer was completed on December 3, 2025. With the implementation of mitigation measures, the undertaking would result in Historic Properties – No Adverse Effect.

Mitigation Measures

IHS shall implement the following measures during construction of the improvements proposed under the Proposed Project:

MM HIS-1 Preservation in place is the preferred manner of treatment for archaeological resources. If preservation is not feasible then a Historic Property Treatment Plan and data recovery plan, which provides for adequately recovering scientifically consequential information from and about the Historic Property, shall be prepared for identified historic properties and adopted prior to any undertaking or project-related excavation.

MM HIS-2 Prior to Project implementation, a Secretary of the Interior qualified Archaeologist and San Pasqual Tribal Monitor will conduct a historic property training for all on-site personnel related to historic properties for the Project. The training will provide an overview of known historic properties, as well as information related to historic properties that may be identified during project implementation, how to identify them, and the process to follow in the case of discovery. All personnel that access the site must undergo this training.

MM HIS-3 A qualified historic properties monitor and/or San Pasqual Tribal Monitor shall be present during all ground-disturbing activities, including any grubbing or minor site preparation efforts that would impact surface historic properties, throughout the duration of Project construction. The monitor would coordinate with the Project Archaeologist, who will serve as the Principal Investigator for the Project.

MM HIS-4 An appropriate avoidance, minimization, and mitigation plan shall be created, implemented and complied with during construction of the project.

5.1.9 Public Services

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not modify police or fire protection service needs.
Proposed Project	The Proposed Project would not involve construction of structures that would require additional police or fire presence and monitoring.

No Project Alternative

Under the No Project Alternative there would be no impacts to fire protection and law enforcement services. No alterations to the Proposed Project area would be made which require increased security measures or fire prevention efforts.

Proposed Project

The Proposed Project would not generate significant impacts to fire protection and law enforcement services within the Band Reservation area, or the Proposed Project area. Subterranean utility infrastructure would not require additional fire or police protection services or monitoring. The Proposed Project would introduce additional aboveground structures, though, in the form of the WWTP. Although this facility would not be manned at all times, and would employ temporary maintenance workers, the facility includes the expansion of energy facilities through the construction of a backup generator, an electrical pad, an electrical meter, and electrical transformer See ***Figure 1.3: Wastewater Treatment Plant Site Layout***. However, these structures are not inherently hazardous in a manner that would require additional and specialized fire protection services beyond what is currently offered by the Band. Additionally, the presence of the WWTP would not generate a need for additional police presence beyond the Band's current capability. The WWTP would also be fully fenced to further provide security measures for the aboveground facility. Impacts would be less than significant.

Mitigation Measures

None required.

5.1.10 Utilities

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not require new or greater utility services.
Proposed Project	The Proposed Project would not involve construction of structures that would substantially expand the use of or demand for utility resources. The Proposed Project would introduce an additional utility resource to the Band Reservation Area.

No Project Alternative

Under the No Project Alternative, the Proposed Project would not require additional utility improvements or demand. Existing septic systems will continue to require maintenance and replacement, resulting in potentially reduced effluent water quality. This would maintain a continued negative impact when compared to the Proposed Project.

Proposed Project

Water

The Proposed Project would not generate additional water demand for the Proposed Project Area. Conversely, the WWTP would include recycled water storage with a maximum capacity of 50,000 gallons. This would instead generate a new non-potable water source for use within the Band Reservation Area for uses which do not require potable water such as landscape irrigation and fire protection. The Proposed Project would provide a beneficial impact. Impacts would be less than significant.

Wastewater

Under the Proposed Project, approximately 393 septic tanks currently within the Proposed Project area would be pumped, crushed and abandoned in place. The use of septic systems for wastewater treatment and disposal would cease. Instead, wastewater generated within the Proposed Project area would be conveyed to the new WWTP with a projected average daily flow rate of 116,465 gallons per day. Additionally, the proposed WWTP would allow for a more advanced level of wastewater treatment and the generation of recycled water for the use of the Band. The use of recycled water would further reduce the Band's groundwater usage since recycled water could be utilized for landscaping and other non-potable uses. Impacts to wastewater resources would be less than significant.

Solid Waste

The Proposed Project would generate solid waste during the construction period. However, this would be accommodated by the San Pasqual Environmental Department (SPED) through partnership with the Band's transfer station as well as local landfills. The Proposed Project would not generate waste during operation. Wastewater sludge produced during the treatment process would be treated on site and eventually removed. Although a waste byproduct, the sludge can be composted or used for fertilizer. Overall, construction waste would be temporary and would not create a new consistent source of waste. Additionally, waste generated by the Proposed Project would be minimal. Impacts would be less than significant.

Telecommunications

The Proposed Project would not require or modify telecommunications facilities.

Gas and Electricity

Electricity for the Proposed Project would continue to be provided by San Diego Gas and Electric (SDG&E). No new natural gas infrastructure is proposed for the Proposed Project. However, new electrical infrastructure is proposed. Namely, backup generators for the WWTP and lift stations, an electrical pad, an electrical meter, and electrical transformer; See ***Figure 1.3: Wastewater Treatment Plant Site Layout***. Electrical requirements for the WWTP would total approximately 96 kilowatts (kw) of electricity. This would not constitute a substantial use or increase of electrical energy in the area. Despite unsubstantial energy demand, the Proposed Project would still generate an increased energy demand compared to existing conditions. Despite this, impacts to utility services would be less than significant.

Mitigation Measures

None required.

5.1.11 Hazardous Materials, Solid Waste, and Pollution Prevention

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not generate additional operational hazardous materials.
Proposed Project	The Proposed Project would not involve construction of structures that would exceed allowable levels or operations activities which would create harmful hazardous materials.

No Project Alternative

Under the No Project Alternative, no WWTP would be developed. The existing septic systems within the Proposed Project area would remain and no change would occur. The existing septic system effluent would continue to percolate through the soil to groundwater below.

Proposed Project

The Proposed Project construction would result in the transport, use, and disposal of hazardous materials such as gasoline fuels, oils, lubricants, and greases in construction equipment and coatings. The use of these materials would not be in such quantities or stored in such a manner as to pose a significant safety hazard. Additionally, use of these materials would be temporary in nature and would cease upon completion of the Proposed Project's construction use. Operation of the Proposed Project would consist of cleaners, solvents, paints for custodial purposes and use of pesticides, and herbicides for landscape maintenance. Furthermore, the use and storage of these materials would be required to be consistent with multiple regulatory measures including The Federal Toxic Substances Control Act of 1976 and Resource Conservation and Recovery Act (RCRA). Additionally, the Proposed Project would involve the conveyance and treatment of wastewater. Effluent material from the WWTP would include treated wastewater, recycled water, and sludge waste. The recycled water would be stored and used for non-potable uses. The wastewater would be percolated down into the groundwater at a treatment level higher than the existing septic system. Wastewater effluent from the proposed WWTP would undergo secondary treatment prior to use as recycled water, cleaning liquid, and percolated back into the groundwater aquifer.

As previously stated, The Proposed Project area is not included on the list of hazardous waste sites. According to the U.S EPA Underground Storage Tanks (UTS) Finder, no current or previous cleanup site is within 1,000 feet of the Proposed Project Area.

Mitigation Measure

None required.

5.1.12 Transportation

Overview of Impacts

Alternative	Impacts
No Project Alternative	The No Project Alternative would not include construction of the Proposed Project and would not alter existing transportation resources.
Proposed Project	The Proposed Project would not involve construction of structures that would substantially diminish transportation resources.

No Project Alternative

The No Project Alternative would have no effect on transportation in the Proposed Project area or vicinity as no physical changes to existing conditions would occur. Traffic patterns and roadway conditions would remain consistent with existing conditions.

Proposed Project

Construction of the Proposed Project would necessitate partial and temporary closure of adjacent roadways and roadways which overlay planned sewer alignments. These improvements would be completed in sections and would not require complete roadway closures. Furthermore, the construction period for the Proposed Project would be temporary in nature and would not require permanent roadway modifications, closures, or removals. One new service road is proposed for the WWTP rounding most of the facility and planned improvements. This would be a gated private road providing access only to the WWTP from District A and District B via Canal Road and Lake Wohlford Road. Operational conditions for both roadways would remain unaffected in the Proposed Project operations. Therefore, impacts would be less than significant.

Mitigation Measures

None required.

5.2 Identified Mitigation Measures

Table 5.9: Summary of Mitigation Measures

Topic Area	Mitigation Measure
Topography, Geology, and Soils	**MM GEO-1:** Prior to commencing grading, a preconstruction conference should be held at the site with the inspector, developer, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the grading plans can be discussed at that time.
	MM GEO-2: Prior to the commencement of grading, a geotechnical consultant shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications.
Water Resources	**MM WR-1:** Development within Special Flood Hazard Areas outside of the floodway (i.e., District A or elsewhere) is appropriate from the perspective of flood risk/flood impact provided that: 1. New structures are properly elevated above Base Flood Elevations, and 2. Project hydrology is mitigated to pre-project conditions.
	MM WR-2: If avoidance of Waters of the United States is not feasible, a Section 404 permit will be required for Project authorization. USACE will review and verify the jurisdictional delineation and determine mitigation requirements for the Project, if applicable.
	MM WR-3: Prior to construction activities which involve County maintained roadways, plans would be submitted to County of San Diego Department of Public Works for review of any work within the county right of way, or any work that could impact the county right of way or any county roadway drainage facilities.
Biological Resources	**MM BIO-1:** The Proposed Project shall be designed to utilize existing developed areas including roads, bare ground, and disturbed areas to the greatest extent possible to avoid impacts to native vegetation communities. However, impact to native habitat could still occur. To minimize impacts to native vegetation, biological monitoring is recommended around all active construction areas, inclusive of the WWTP and any undeveloped work areas to ensure activities are limited to designated temporary and permanent impact areas.
	MM BIO-2: Prior to construction, exclusionary wildlife fencing shall be placed around all active construction areas that contain sensitive habitat areas, inclusive of the WWTP and any undeveloped work areas to avoid impacts. Daily pre-construction sweeps within the exclusionary fencing by a qualified biologist would be implemented prior to the commencement of construction activities.
	MM BIO-3: To avoid impacts to nesting birds that are protected by the Migratory Bird Treaty Act (MBTA), construction would be conducted outside of nesting season (generally September 1 through January 14). If construction outside the breeding season is not feasible, pre-construction nesting bird surveys shall be conducted during the nesting season (generally January 15 through August 31) at least 10 days prior to construction near suitable nesting habitat.
	MM BIO-4: Nesting bird surveys shall be conducted within 150 feet for non-listed passerines, 300 feet for special status passerines, and 500 feet for raptors around all active construction areas, inclusive of the WWTP and any undeveloped work areas. If an active nest is found of a non-special status species, an appropriate no-work buffer shall be established around the nest by a qualified

<table>
<tr><th>Topic Area</th><th>Mitigation Measure</th></tr>
<tr><td rowspan="2"></td><td>biologist that takes into account the species, ambient disturbance, perceived tolerance to disturbance of the nest, and planned construction activities including potential direct and indirect impacts (e.g., noise and vibration from construction activities). Nest buffers shall be established with stakes, flagging, and signage as appropriate to ensure construction personnel do not enter the buffer. Drive-through-only or walk-through-only buffers may be established if a qualified biologist determines that the nest would not be affected by such activities past an active nest.</td></tr>
<tr><td>MM BIO-5: For special status species that are not listed, a 300-foot buffer shall be established for special status passerines and a 500-foot buffer shall be established for special status raptors around all active construction areas, inclusive of the WWTP and any undeveloped work areas. If a listed avian species establishes an active nest during construction, a 500-foot buffer would be established and USFWS shall be notified. Buffer reductions for special status species may be possible on a case-by-case basis if the nest shows a high tolerance to disturbance through coordination with USFWS. Nest buffers shall be established with stakes, flagging, and signage as appropriate to ensure construction personnel do not enter the buffer. Drive-through-only or walk-through-only buffers may be established if a qualified biologist determines that the nest would not be affected by such activities past an active nest.</td></tr>
<tr><td>Air Quality</td><td>MM AQ-1: Prior to the issuance of grading permits, the Band Engineer shall confirm that the Grading Plan and Building Plans and Specifications require all construction contractors to incorporate the following measure to minimize construction emissions.
All off-road diesel-powered construction equipment greater than 50 horsepower meets California Air Resources Board Tier 4 Final off-road emissions standards or incorporate CARB Level 3 Verified Diesel Emission Control Strategy (VDECS). Requirements for Tier 4 Final equipment and the option for Level 3 VDECS shall be included in applicable bid documents and successful contractor(s) must demonstrate the ability to supply such equipment. A copy of each unit’s Best Available Control Technology (BACT) documentation (certified tier specification or model year specification), and CARB or SDAPCD operating permit (if applicable) shall be provided to the Band at the time of mobilization of each applicable unit of equipment. This equipment shall be used when commercial models that meet the construction needs of the proposed project are commercially available from local suppliers/vendors. The determination of commercial availability of such equipment shall be made by the Band, based on applicant-provided evidence from expert sources, such as construction contractors in the region.</td></tr>
<tr><td>Noise</td><td>MM N-1: Construction Noise Control Plan. The Proposed Project shall prepare and implement a Construction Noise Logistics Plan for all construction activities that includes, at a minimum, the following measures:
Prohibit unnecessary idling of internal combustion engines. Post signs at gates and other places where vehicles may congregate reminding operators of the State’s Airborne Toxic Control Measure (ATCM) limiting idling to no more than 5 minutes.
Utilize “quiet” air compressors and other stationary noise sources where technology exists.
Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the Proposed Project site.
Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other State required noise attenuation devices.
Property owners and occupants located within the noise impact zones identified in Figures 4-7.1a through 4-7.1e shall be sent a notice, at least 15 days prior to commencement of construction activities, regarding the construction schedule of the Proposed Project. A sign, legible at 50 feet shall also be posted at the Proposed Project construction site indicating the dates and duration of construction activities, as well as provide a contact name and a telephone number for the Noise Disturbance Coordinator where residents can inquire about the construction process and register complaints.
Prior to issuance of any grading or construction permit, the Contractor shall provide evidence that at all times during construction activities and on-site construction staff member will be</td></tr>
</table>

Topic Area	Mitigation Measure
	designated as a Noise Disturbance Coordinator. The Noise Disturbance Coordinator is responsible for responding to complaints about construction noise. When a complaint is received, the Noise Disturbance Coordinator shall determine the cause (e.g., starting too early, bad muffler, etc.), implement reasonable measures to resolve the complaint, and document actions taken. All notices sent to residential units within the noise impact zone and all signs posted at the construction site, shall include the telephone number for the Coordinator, as well as a description of the Coordinators specified roles and responsibilities at the construction site. Additionally, a log of noise complaints and responses shall be maintained and made available upon request. • Electrical power will be used to run air compressors and similar power tools and to power any temporary structures, such as construction trailers or security staff facilities.
	MM N-2: For all noise-generating construction activities, additional noise attenuation techniques would be employed as necessary to reduce noise levels. Such techniques could include, but are not limited to, the use of sound blankets, noise shrouds and temporary sound barriers between construction areas and nearby sensitive receptors as specified in the noise control plan.
Historical, Architectural, Archeological, and Cultural Resources	**MM HIS-1:** Preservation in place is the preferred manner of treatment for archaeological resources. If preservation is not feasible then a Historic Property Treatment Plan and data recovery plan, which provides for adequately recovering scientifically consequential information from and about the Historic Property, shall be prepared for identified historic properties and adopted prior to any undertaking or project-related excavation.
	MM HIS-2: Prior to Project implementation, a Secretary of the Interior qualified Archaeologist and San Pasqual Tribal Monitor will conduct a historic property training for all on-site personnel related to historic properties for the Project. The training will provide an overview of known historic properties, as well as information related to historic properties that may be identified during project implementation, how to identify them, and the process to follow in the case of discovery. All personnel that access the site must undergo this training.
	MM HIS-3: A qualified historic properties monitor and/or San Pasqual Tribal Monitor shall be present during all ground-disturbing activities, including any grubbing or minor site preparation efforts that would impact surface historic properties, throughout the duration of Project construction. The monitor would coordinate with the Project Archaeologist, who will serve as the Principal Investigator for the Project.
	MM HIS-4: An appropriate avoidance, minimization, and mitigation plan shall be created, implemented and complied with during construction of the Proposed Project.

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6.0 The Relationship Between Short-Term Uses of the Manmade Environment and Long-Term Productivity

The No Project Alternative would maintain the current state of the Band's Reservation area in that the Band's area would continue to use individual septic systems and tanks for most residences. Short-term, no modification to the environment would occur aside from the continued seepage of wastewater into the local groundwater. However, in the long-term, this would mean that the existing septic infrastructure would continue to degrade over time, requiring costly maintenance and the eventual abandonment and construction of new septic systems.

The Proposed Action and Proposed Project during the short-term period (construction), would result in impacts to the environment which were deemed less than significant with the implementation of mitigation measures. However, impacts are further reduced in long term effects as most of the proposed project construction will be underground and include the construction of an updated community wastewater system. Further, the Proposed Project would present a long-term benefit to the area as the existing septic systems would be removed and improved wastewater treatment would be introduced. The Proposed Project would present both a long-term environmental and socioeconomic benefit to the Band. Additionally, the implementation of mitigation measures recommended in Section 5 of this EA would continue to minimize any potential long-term effects of Project development to less than significant levels.

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7.0 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are those that utilize or modify a resource in a manner that would not allow for those resources to be utilized for future uses or by future generations. These generally refer to nonrenewable resources such as fossil fuels, minerals, and substantial use of water resources. Irretrievable resources are those that would be removed from availability through relatively short-range actions, regardless of the renewable nature of the resource. However, irretrievable resources can be reversed based on a reversion of an area to hospitable conditions. An example is the loss of forestry resources due to the redevelopment of forestry lands.

No irreversible or irretrievable commitments of resources would occur under either the No Action Alternative. The construction and operational activities associated with the Project would create an irretrievable commitment of nonrenewable energy and water through the use of diesel and other gas-powered machinery as well as water for construction activities such as the adequate watering of loose soils during ground disturbing activities in keeping with air quality standards and guidelines. No irretrievable commitment of resources would occur as a result of the Project. The proposed sewer improvements would occupy existing developed areas without modifying the existing land uses. The proposed WWTP would redevelop a previously disturbed portion of the Band Reservation Area, however, this area is not occupied by a resource which would be considered irretrievable.

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9.0 LIST OF AGENCIES AND PERSONS CONSULTED

9.1 Agencies

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Not Applicable

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Appendix A – Soil Report

United States Department of Agriculture

NRCS

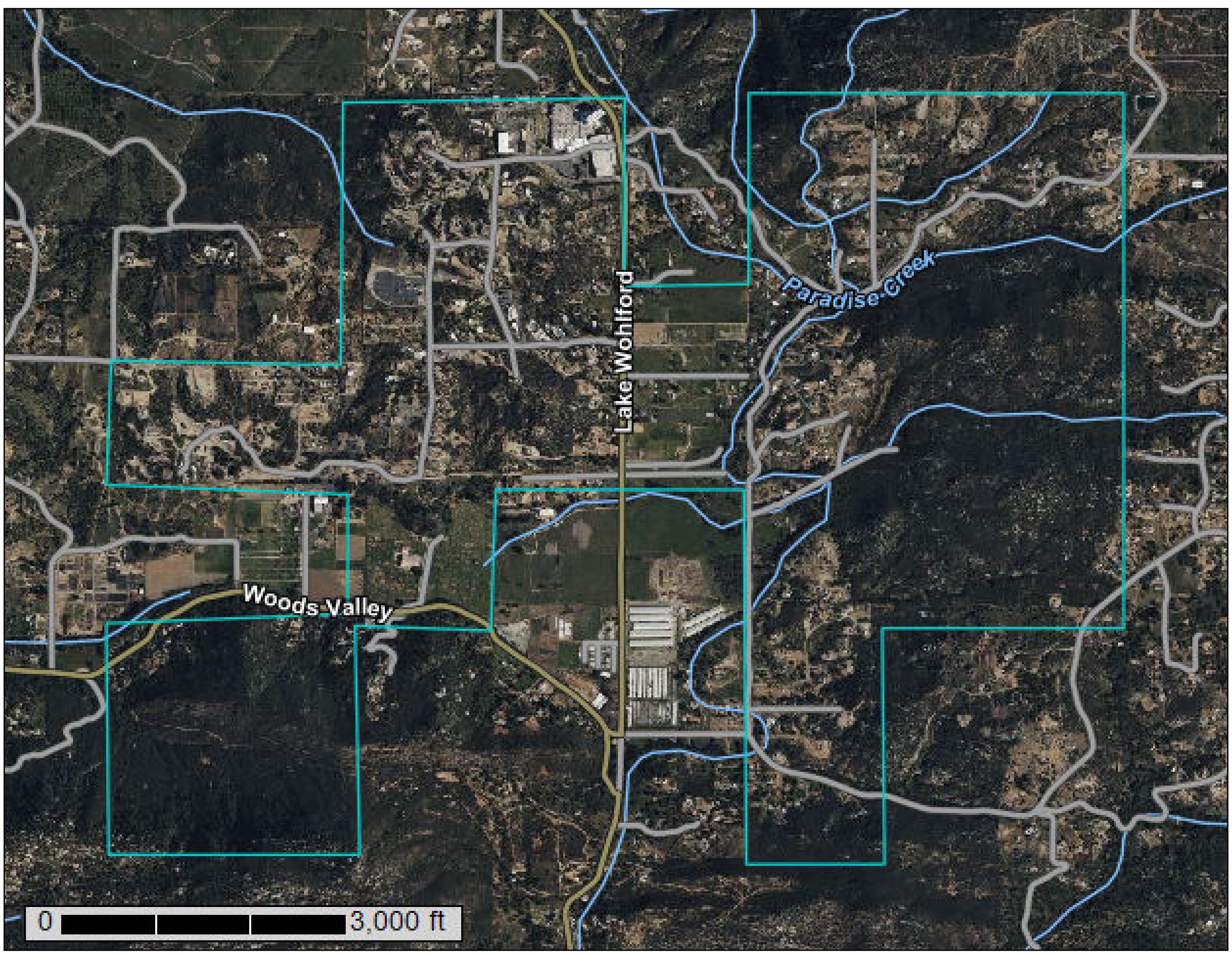
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

San Diego County Area, California

San Pasqual Community Sewer Conversion



March 2, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

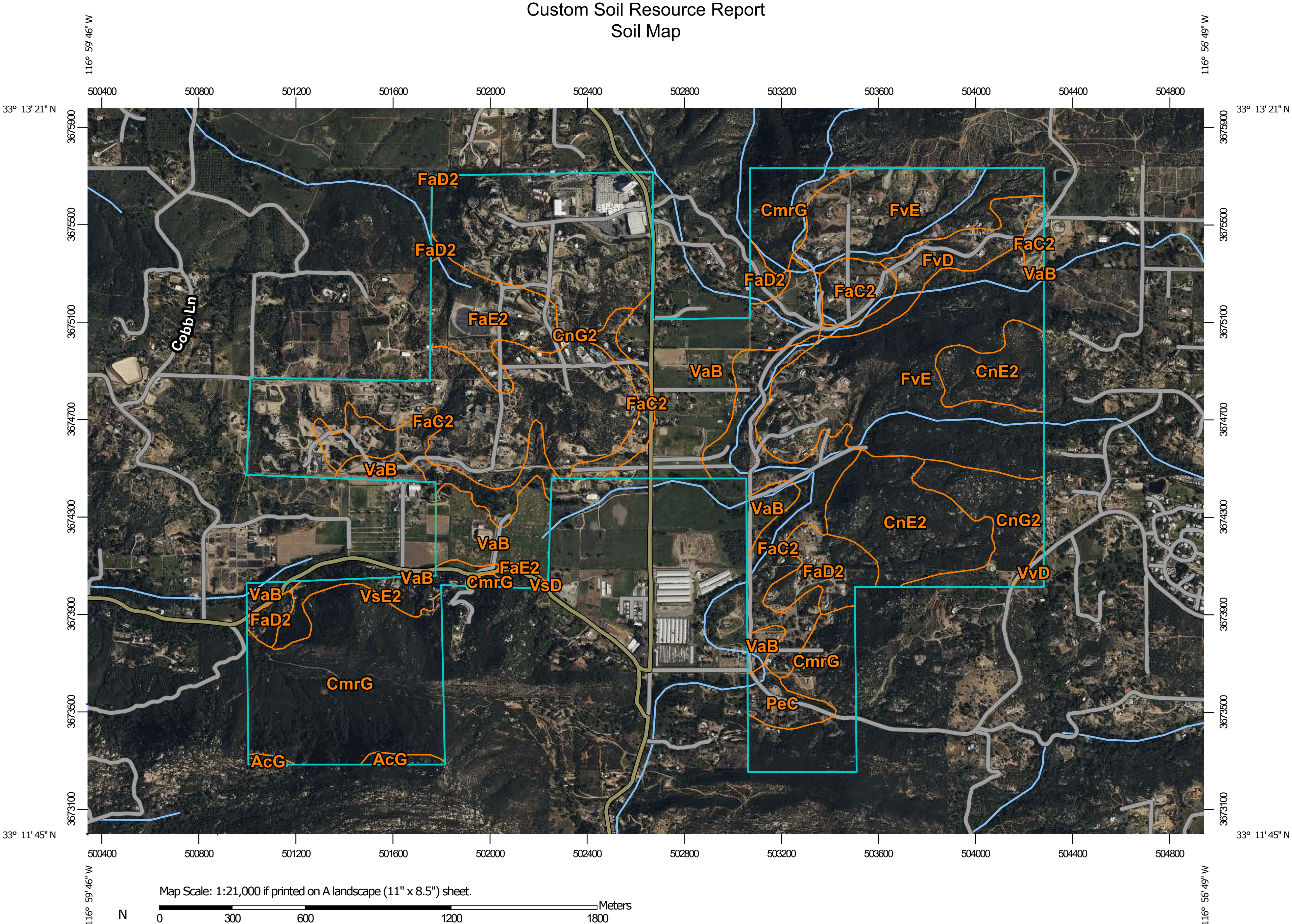
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:21,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 300, 600, 1200, 1800

Feet: 0, 1000, 2000, 4000, 6000

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:24,000.

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: San Diego County Area, California
Survey Area Data: Version 19, Aug 30, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AcG	Acid igneous rock land	4.8	0.4%
CmrG	Cieneba-Rock outcrop complex, 30 to 75 percent slopes, very stony	192.3	15.6%
CnE2	Cieneba-Fallbrook rocky sandy loams, 9 to 30 percent slopes, eroded	88.0	7.2%
CnG2	Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded	295.0	24.0%
FaC2	Fallbrook sandy loam, 5 to 9 percent slopes, eroded	142.7	11.6%
FaD2	Fallbrook sandy loam, 9 to 15 percent slopes, eroded	37.8	3.1%
FaE2	Fallbrook sandy loam, 15 to 30 percent slopes, eroded	45.5	3.7%
FvD	Fallbrook-Vista sandy loams, 9 to 15 percent slopes	30.9	2.5%
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes	218.2	17.7%
PeC	Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19	13.4	1.1%
VaB	Visalia sandy loam, 2 to 5 percent slopes	139.1	11.3%
VsD	Vista coarse sandy loam, 9 to 15 percent slopes, MLRA 20	0.1	0.0%
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded	20.2	1.6%
VvD	Vista rocky coarse sandy loam, 5 to 15 percent slopes	2.7	0.2%
Totals for Area of Interest		**1,230.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

AcG—Acid igneous rock land

Map Unit Setting

National map unit symbol: 2zwsj
Elevation: 1,130 to 4,380 feet
Mean annual precipitation: 6 to 24 inches
Mean annual air temperature: 55 to 67 degrees F
Frost-free period: 180 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Acid igneous rock land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Acid Igneous Rock Land

Setting

Landform: Mountains
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Acid igneous rock

Typical profile

R - 0 to 4 inches: bedrock

Properties and qualities

Slope: 7 to 75 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: No

CmrG—Cieneba-Rock outcrop complex, 30 to 75 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2zwsb
Elevation: 3,670 to 4,440 feet
Mean annual precipitation: 25 to 29 inches
Mean annual air temperature: 55 to 57 degrees F
Frost-free period: 185 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 50 percent
Rock outcrop: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Residuum weathered from quartz-diorite

Typical profile

A - 0 to 10 inches: coarse sandy loam
Cr - 10 to 20 inches: bedrock

Properties and qualities

Slope: 30 to 75 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: 9 to 16 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R019XD924CA - LOAMY WEST
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8e
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave

Across-slope shape: Linear
Hydric soil rating: No

Las posas

Percent of map unit: 5 percent
Landform: Mountains
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R019XD924CA - LOAMY WEST
Hydric soil rating: No

CnE2—Cieneba-Fallbrook rocky sandy loams, 9 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hb9w
Elevation: 300 to 4,000 feet
Mean annual precipitation: 8 to 35 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 110 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 45 percent
Fallbrook and similar soils: 35 percent
Rock outcrop: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 20 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R019XD060CA - SHALLOW LOAMY
Hydric soil rating: No

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 24 inches: sandy clay loam
H3 - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent
Hydric soil rating: No

CnG2—Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded

Map Unit Setting

National map unit symbol: hb9x
Elevation: 300 to 4,000 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 200 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 40 percent
Fallbrook and similar soils: 35 percent
Rock outcrop: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 14 inches: weathered bedrock

Properties and qualities

Slope: 30 to 65 percent
Depth to restrictive feature: 4 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R019XD060CA - SHALLOW LOAMY
Hydric soil rating: No

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 24 inches: sandy clay loam
H3 - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 30 to 65 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Description of Rock Outcrop

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent
Hydric soil rating: No

FaC2—Fallbrook sandy loam, 5 to 9 percent slopes, eroded

Map Unit Setting

National map unit symbol: hbbt
Elevation: 200 to 3,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 320 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Fallbrook and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam
H3 - 12 to 28 inches: sandy clay loam
H4 - 28 to 47 inches: loam
H5 - 47 to 51 inches: weathered bedrock

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Vista
Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba
Percent of map unit: 2 percent
Hydric soil rating: No

Bonsall
Percent of map unit: 2 percent
Hydric soil rating: No

Las posas
Percent of map unit: 1 percent
Hydric soil rating: No

FaD2—Fallbrook sandy loam, 9 to 15 percent slopes, eroded

Map Unit Setting
National map unit symbol: hbbv
Elevation: 200 to 3,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition
Fallbrook and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile
H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam
H3 - 12 to 28 inches: sandy clay loam
H4 - 28 to 47 inches: loam

H5 - 47 to 51 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 2 percent
Hydric soil rating: No

Bonsall

Percent of map unit: 2 percent
Hydric soil rating: No

Las posas

Percent of map unit: 1 percent
Hydric soil rating: No

FaE2—Fallbrook sandy loam, 15 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hbbw
Elevation: 300 to 2,000 feet
Mean annual precipitation: 12 to 25 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 250 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 2 inches: sandy loam
H2 - 2 to 24 inches: sandy clay loam
H3 - 24 to 28 inches: sandy loam
H4 - 28 to 32 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 2 percent
Hydric soil rating: No

Bonsall

Percent of map unit: 2 percent
Hydric soil rating: No

Las posas

Percent of map unit: 1 percent
Hydric soil rating: No

FvD—Fallbrook-Vista sandy loams, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbc1
Elevation: 200 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 50 percent
Vista and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 12 inches: loam
H3 - 12 to 28 inches: sandy clay loam
H4 - 28 to 41 inches: loam
H5 - 41 to 44 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F019XG913CA - Loamy Hills <30"ppt

Hydric soil rating: No

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Grus derived from granodiorite and/or grus derived from quartz-diorite

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 35 inches: coarse sandy loam
H3 - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F019XG913CA - Loamy Hills <30"ppt
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

Las posas

Percent of map unit: 5 percent
Hydric soil rating: No

FvE—Fallbrook-Vista sandy loams, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbc2

Elevation: 200 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 50 percent
Vista and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam
H3 - 12 to 28 inches: sandy clay loam
H4 - 28 to 47 inches: loam
H5 - 47 to 51 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: F019XG913CA - Loamy Hills <30"ppt
Hydric soil rating: No

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Grus derived from quartz-diorite and/or grus derived from granodiorite

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 35 inches: coarse sandy loam
H3 - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F019XG913CA - Loamy Hills <30"ppt
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

Las posas

Percent of map unit: 5 percent
Hydric soil rating: No

PeC—Placentia sandy loam, 2 to 9 percent slopes, warm MAAT, MLRA 19

Map Unit Setting

National map unit symbol: 2tyyn
Elevation: 150 to 2,950 feet
Mean annual precipitation: 13 to 18 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 270 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Placentia and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placentia

Setting

Landform: Terraces, alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Alluvium derived from granitoid

Typical profile

A1 - 0 to 4 inches: sandy loam
A2 - 4 to 13 inches: sandy loam
Bt1 - 13 to 21 inches: sandy clay
Bt2 - 21 to 34 inches: sandy clay
BC - 34 to 53 inches: sandy clay loam
C - 53 to 63 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R019XD061CA - CLAYPAN
Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 5 percent
Hydric soil rating: No

Ramona

Percent of map unit: 4 percent
Hydric soil rating: No

Typic natrixeralfs, occasionally ponded

Percent of map unit: 1 percent

Landform: Depressions
Hydric soil rating: Yes

VaB—Visalia sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: hbh3
Elevation: 0 to 1,500 feet
Mean annual precipitation: 9 to 30 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 200 to 350 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Visalia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Visalia

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 40 inches: fine sandy loam
H3 - 40 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: R019XG911CA - Loamy Fan
Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent
Hydric soil rating: No

Grangeville

Percent of map unit: 5 percent
Hydric soil rating: No

Placentia

Percent of map unit: 2 percent
Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

VsD—Vista coarse sandy loam, 9 to 15 percent slopes, MLRA 20

Map Unit Setting

National map unit symbol: 2xgtp
Elevation: 70 to 3,900 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 320 to 360 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and quartz-diorite

Typical profile

A - 0 to 3 inches: coarse sandy loam
Bw - 3 to 19 inches: coarse sandy loam

C - 19 to 35 inches: coarse sandy loam
Cr - 35 to 45 inches: weathered bedrock

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Hydric soil rating: No

Fallbrook

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Bonsall

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Capistrano

Percent of map unit: 2 percent

Landform: Hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

VsE2—Vista coarse sandy loam, 15 to 30 percent slopes, eroded

Map Unit Setting

National map unit symbol: hbhd
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and quartz-diorite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 30 inches: sandy loam
H3 - 30 to 34 inches: weathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Minor Components

Fallbrook

Percent of map unit: 10 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

VvD—Vista rocky coarse sandy loam, 5 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbhg
Elevation: 400 to 4,000 feet
Mean annual precipitation: 8 to 18 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 110 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 70 percent
Rock outcrop: 25 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and quartz-diorite

Typical profile

H1 - 0 to 13 inches: coarse sandy loam
H2 - 13 to 27 inches: sandy loam
H3 - 27 to 31 inches: weathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R019XD029CA - LOAMY
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Fallbrook

Percent of map unit: 3 percent
Hydric soil rating: No

Cieneba

Percent of map unit: 2 percent
Hydric soil rating: No

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: "National Soil Survey Handbook."

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5

Extremely acid: 3.5 to 4.4

Very strongly acid: 4.5 to 5.0

Strongly acid: 5.1 to 5.5

Moderately acid: 5.6 to 6.0

Slightly acid: 6.1 to 6.5

Neutral: 6.6 to 7.3

Slightly alkaline: 7.4 to 7.8

Moderately alkaline: 7.9 to 8.4

Strongly alkaline: 8.5 to 9.0

Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)
High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)
Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)
Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)
Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)
Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1

Moderate: 13-30:1

Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0

Coarse sand: 1.0 to 0.5

Medium sand: 0.5 to 0.25

Fine sand: 0.25 to 0.10

Very fine sand: 0.10 to 0.05

Silt: 0.05 to 0.002

Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated
Prismatic: Vertically elongated and having flat tops
Columnar: Vertically elongated and having rounded tops
Angular blocky: Having faces that intersect at sharp angles (planes)
Subangular blocky: Having subrounded and planar faces (no sharp angles)
Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand
Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

Appendix B – Geotechnical Investigation

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

FEASIBILITY STUDY AND RESULTS OF PERCOLATION TESTING

SAN PASQUAL WASTEWATER TREATMENT PLANT
VALLEY CENTER, CALIFORNIA

PREPARED FOR

KIMLEY-HORN & ASSOCIATES
SAN DIEGO, CALIFORNIA

MARCH 30, 2023
PROJECT NO. G3081-42-01

Project No. G3081-42-01
March 30, 2023

Kimley-Horn & Associates
401 B Street, Suite 600
San Diego, California 992101

Attention: Ms. Renee Chuang

Subject: FEASIBILITY STUDY AND RESULTS OF PERCOLATION TESTING
SAN PASQUAL WASTEWATER TREATMENT PLANT
VALLEY CENTER, CALIFORNIA

Dear Ms. Chuang:

In accordance with your request, we have prepared this feasibility study for the proposed new wastewater treatment plant. We have also performed percolation testing. This report is based on our review of relevant published and unpublished literature, a site reconnaissance, exploratory borings, and our experience with soil and geologic conditions in the Valley Center area. The accompanying report describes the site soil and geologic conditions, discusses potential geotechnical constraints and geologic hazards, and provides preliminary recommendations for site development.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

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TABLE OF CONTENTS

1. PURPOSE AND SCOPE

This report contains the results of our feasibility study and percolation testing for the proposed wastewater treatment plant on the vacant lot located east of the intersection of Lake Wohlford Road and Augustine Orosco Lane in the Valley Center area of San Diego, California (see Vicinity Map below).

Vicinity Map

The purposes of this study are to provide preliminary soil and geologic information for the property, identify known geologic hazards that may adversely impact development, provide a summary of the percolation testing data, and to provide general grading recommendations based on the information collected during our field investigation.

The scope of our study included performing a site reconnaissance and preliminary geologic mapping, reviewing readily available published geologic literature pertinent to the property, infiltration testing, and reviewing the following plans:

1. *Exhibit: Proposed Package Wastewater Treatment Site, San Pasqual Band Mission Indian Reservation, Valley Center, California,* prepared by Kimley-Horn, undated (Job No. 19592101).

2. *San Pasqual Indian Reservation, Wastewater Feasibility Study, Figure 5-5, Collection, Treatment, and Subsurface Disposal System with WWTP Located on 40-Acre Parcel, Valley Center, California,* prepared by Hydroscience, undated.

Our field investigation consisted of drilling nine, small-diameter borings to evaluate the underlying geologic conditions within the area of planned improvements, and performing four percolation tests to provide information for the planned percolation ponds.

The locations of the small-diameter borings and percolation tests are shown the *Geologic Map*, Figure 1. The base map used for Figure 1 is an AutoCAD version of Reference 2 prepared by Kimley-Horn & Associates. Logs of the exploratory borings and a detailed discussion of the field investigation are presented in Appendix A. Laboratory testing is provided in Appendix B.

2. SITE AND PROJECT DESCRIPTION

The project site consists of an approximately 227-square-foot vacant lot bounded by Canal Road to the east, vacant land to the north, west and south, and baseball fields to the northwest. The site is sparsely vegetated with grasses, brush, and trees. Several large rock outcrops are present throughout the planned area of improvements. Review of historic aerial photographs indicates that the site was previously occupied by two residences with ancillary structures that were demolished circa 2017. Historical photographs also show that minor grading has occurred throughout the site. Topography across the site ranges from flat to gently sloping with elevations between 1,645 feet and 1,677 feet mean sea level (MSL). Surface drainage across the site flows to the northwest.

Based on the exhibit plan (Reference 1), the project will consist of constructing a wastewater treatment plant, a pump station, a water storage tank, percolation ponds, and private driveways. Entrance to the proposed wastewater treatment plant is planned along Canal Road.

3. SOIL AND GEOLOGIC CONDITIONS

The site is underlain by undocumented fill, topsoil, old alluvium, and granitic rock. The geologic units observed at the site are described below. Geologic conditions are depicted on the Geologic Map, Figure 2. Exploratory trench and boring logs are presented in Appendix A.

3.1 Undocumented Fill (Unmapped)

We did not observe undocumented fill during our field investigation; however, we expect undocumented fill associated with abandoned utility lines, building foundations, and in areas of previous minor grading is present on the property. Undocumented fill is unsuitable for support of structural fill or other improvements, and if encountered, will require removal and replacement with properly compacted fill.

3.2 Topsoil (Unmapped)

Topsoil consisting of loose, moist, silty sand was encountered on the property, ranging in thickness from 1.5 feet to 4 feet. Topsoil could be thicker in unexplored areas of the site. Topsoil is unsuitable for support of structural fill or other improvements and will require removal and replacement with properly compacted fill.

3.3 Old Alluvium (Qoal)

We encountered old alluvium underlying the topsoil in borings B-1 through B-4, B-8, and B-9 to depths ranging from 2 to 8 feet. The alluvium generally consists of medium dense, moist, clayey sand and sandy clay. Based on the laboratory test results, the old alluvium possesses a "low" expansion potential (expansion index of 50 or less). The old alluvium should be suitable to support the planned improvements or structural fills.

3.4 Granitic Rock (Kgr)

Cretaceous-aged Granitic Rock is present as surface outcrops in some areas of the site, and underlies the old alluvium across the remainder of the site. The granitic rock encountered in the test pits and borings is characterized as weak, weathered, granitic rock, that excavates as a silty, fine to medium sand. Excavations within the granitic rock can generate boulders and oversize materials (rocks greater than 12 inches in dimension) that will require special handling and placement and possible exporting. The granitic rock is suitable to support the planned improvements.

4. GROUNDWATER

We did not encounter groundwater during our site investigation. It is not uncommon for shallow seepage conditions to develop where none previously existed when sites are irrigated, or infiltration is implemented. Seepage is dependent on seasonal precipitation, irrigation, land use, among other factors, and varies as a result. Proper surface drainage will be important to future performance of the project.

5. GEOLOGIC HAZARDS

5.1 Ground Rupture

No evidence of faulting was observed during our investigation. USGS (2016) and Rodgers (1965) show that there are no Quaternary age faults crossing or trending toward the property. CGS (2021a) shows that site is not within a State of California designated Earthquake Fault Zone. The risk associated with ground rupture hazard is low.

5.2 Seismicity

Considerations important in seismic design include frequency and duration of motion and soil conditions underlying the site. Seismic design of structures should be evaluated in accordance with the California Building Code (CBC) guidelines currently adopted by the local agency. The nearest known active fault is the Elsinore Fault Zone, located approximately 8 miles northeast of the site (CGS, 2016). The risk associated with strong ground motion due to earthquakes is high; however, the risk is no greater than that for the region.

5.3 Liquefaction and Seismically Induced Settlement

The risk associated with liquefaction and seismically induced settlement is low due to the age and density of the underlying sediments.

5.4 Landslides

No evidence of landsliding at the site was observed during our investigation. Rodgers (1965) show that there are no landslides mapped at the site or at locations that could affect the site. The risk associated with landslide hazard at the site is low.

5.5 Tsunamis and Seiches

The site is not located within a tsunami inundation zone as defined by CGS (2021b). There are no lakes or reservoirs located near the site. The risk associated with inundation hazard due to tsunami or seiche is low.

5.6 Flooding

A majority of the site is not mapped in a Special Flood Risk Hazard Zone (FEMA, 2012). However, the west perimeter of the site is mapped in Zone AE. The risk associated with flooding is low with exception to the west perimeter.

6. PERCOLATION TESTING

We performed a four percolation tests, P-1 through P-4, at the locations are shown on Figure 1. The tests holes were approximately 8 inches in diameter and extended 3 feet and 4 feet below existing grade. The sides and base of the holes were cleaned of loose soil and a 2-inch layer of gravel was placed at the bottom of the hole. A 3-inch diameter pipe was inserted in the borehole and gravel packed to reduce the potential for caving. The holes were then presoaked for a minimum of 4 hours and then tested in accordance with the County of San Diego's *Local Agency Management Program (LAMP) for Onsite*

Wastewater Treatment System (February 24, 2015). For design, we applied a gravel-packed hole correction factor in accordance with the LAMP manual. A summary of the percolation test results is provided on the table below. The percolation rates were slow in tests P-1 through P-3. Test P-4 was relatively fast. Tests P-1 through P-3 were in the old alluvium. P-5 was in the upper sandy weathered portion of the granitic rock.

SUMMARY OF PERCOLATION TEST RESULTS

Percolation Test No.	Depth of Test (feet)	Stabilized Percolation Rate (mpi)	Stabilized Percolation Rate (mpi)
P-1	4	240	550
P-2	3	240	550
P-3	4	160	370
P-4	3	5	12

*Adjustment for Gravel Packed Percolation Test Hole = 2.3

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 No soil or geologic conditions were observed that would preclude the development of the property as presently proposed provided that the recommendations of this report are followed.

7.2 The site is underlain by topsoil, old alluvium, and granitic rock. Topsoil ranges from approximately one to four feet thick. We expect undocumented fill is present in areas of abandoned utility trenches and old building foundations. We observed old alluvium underlying the undocumented fill and topsoil to depths of approximately 2 feet to 8 feet below existing grade. Undocumented fill (if encountered) and topsoil will require remedial grading. The old alluvium and granitic rock is suitable to support the planned improvements.

7.3 Difficult excavation is expected in the granitic rock and may generate oversize rock (> 6 inches) that will require special placement within fill areas and/or exportation from the project.

7.4 We did not encounter groundwater during the field investigation. We do not expect groundwater to be a constraint to project development. However, seepage could be encountered during grading operations, especially during the rainy seasons.

7.5 Except for possible strong seismic shaking, no significant geologic hazards were observed or are known to exist on the site that would adversely affect the site. No special seismic design considerations, other than those recommended herein, are required.

7.6 The risk associated with geologic hazards due to fault-related ground rupture, landslides, slope instability, tsunamis and seiches is low. The risk associated with flooding is low with exception to the west perimeter.

7.7 The proposed building structures can be supported on a shallow foundation system founded in properly compacted fill, old alluvium, and granitic.

7.8 Proper drainage should be maintained in order to preserve the engineering properties of the fill in structural improvement areas. Recommendations for site drainage are provided herein.

7.1 Excavation and Soil Characteristics

7.1.1 Excavation of the on-site soils should be possible with moderate to heavy effort using conventional heavy-duty equipment. Excavations in the granitic rock may require a very heavy effort and localized rock breaking techniques near outcrops and less weathered areas.

7.1.2 The soil encountered in the field investigation is considered to be both "non-expansive" (expansion index [EI] of 20 and less) and "expansive" (EI greater than 20) as defined by 2022 California Building Code (CBC) Section 1803.5.3. Table 7.1 presents soil classifications based on expansion index. We expect a majority of the on-site soil possess a "very low" to "low" expansion potential (EI of 50 or less).

TABLE 7.1
EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX

Expansion Index (EI)	ASTM D 4829 Expansion Classification	2022 CBC Expansion Classification
0 – 20	Very Low	Non-Expansive
21 – 50	Low	Expansive
51 – 90	Medium	
91 – 130	High	
Greater Than 130	Very High	

7.1.3 We performed laboratory tests on samples of the site soils to evaluate water-soluble sulfate content. Appendix B presents results of the laboratory tests. The test results indicate the on-site soils, at the locations tested, possess "S0" sulfate exposure to concrete structures as defined by 2022 CBC Section 1904 and ACI 318-19 Chapter 19. We recommend ACI guidelines be followed when determining the type of concrete used for the project. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations. Over time landscaping activities (i.e., addition of fertilizers and other soil nutrients) may affect the concentration.

7.1.4 We tested samples for potential of hydrogen (pH) and resistivity and chloride to aid in evaluating the corrosion potential. Appendix B presents the laboratory test results.

7.1.5 Geocon Incorporated does not practice in the field of corrosion engineering. Therefore, further evaluation by a corrosion engineer may be needed if improvements susceptible to corrosion are planned.

7.2 Subdrains

7.2.1 With the exception of subdrains for retaining walls, no other subdrains will be required.

7.3 Preliminary Grading Recommendations

7.3.1 Grading should be performed in accordance with the *Recommended Grading Specifications* contained in Appendix C. Where the recommendations of Appendix C conflict with this section of the report, the recommendations of this section take precedence.

7.3.2 Prior to commencing grading, a preconstruction conference should be held at the site with the county inspector, developer, grading and underground contractors, civil engineer, and geotechnical engineer in attendance. Special soil handling and/or the grading plans can be discussed at that time.

7.3.3 Site preparation should begin with the removal of deleterious material, construction debris, and vegetation. The depth of vegetation removal should be such that material exposed in cut areas or soil to be used as fill is relatively free of organic matter. Material generated during stripping and/or site demolition should be exported from the site. Asphalt and concrete should not be mixed with the fill soil unless approved by the Geotechnical Engineer.

7.3.4 Abandoned foundations and buried utilities (if encountered) should be removed and the resultant depressions and/or trenches should be backfilled with properly compacted material as part of the remedial grading.

7.3.5 Within the areas of proposed structural improvements, undocumented fill and topsoil should be completely removed and replaced with properly compacted fill. We expect removal depths ranging from 2 feet to 4 feet below existing grades.

7.3.6 In areas where the grading will result in a cut-to-fill transition within building, tank pads, or structures that are sensitive to differential settlement, the old alluvium and granitic rock should be undercut to a depth of at least 3 feet below pad grade or 1 feet below the bottom of the proposed footings (whichever results in a deeper excavation) and replaced with properly compacted fill.

7.3.7 Remedial removals and undercuts should extend at least 5 feet beyond the limit of the proposed structures and 3 feet beyond surface improvements. The actual extent of remedial grading should be determined in the field by the soil engineer and/or engineering geologist based on conditions observed during grading.

7.3.8 No remedial grading, other than undercutting due to a cut to fill transition, is required in areas where granitic rock or old alluvium is exposed at subgrade elevation.

7.3.9 Prior to placing fill, the exposed ground surface should be scarified, moisture conditioned as necessary, and compacted to a depth of at least 12 inches. The site should then be brought to final subgrade elevations with fill compacted in layers. In general, soil native to the site is suitable for use from a geotechnical engineering standpoint as fill if relatively free from vegetation, debris and other deleterious material. Layers of fill should be no thicker than will allow for adequate bonding and compaction. Fill, including backfill and scarified ground surfaces, should be compacted to a dry density of at least 90 percent of the laboratory maximum dry density near to slightly above optimum moisture content in accordance with ASTM Test Procedure D 1557. Fill materials placed below optimum moisture content may require additional moisture conditioning prior to placing additional fill.

7.3.10 Imported fill (if necessary) should consist of the characteristics presented in Table 7.3. Geocon Incorporated should be notified of the import soil source and should perform laboratory testing of import soil prior to its arrival at the site to determine its suitability as fill material.

TABLE 7.3
SUMMARY OF IMPORT FILL RECOMMENDATIONS

Soil Characteristic	Values
Expansion Potential	"Very Low" to "Low" (Expansion Index of 50 or less)
Particle Size	Maximum Dimension Less Than 3 Inches
	Generally Free of Debris

7.4 Seismic Design Criteria – 2022 California Building Code

7.4.1 Table 7.4.1 summarizes site-specific design criteria obtained from the 2022 California Building Code (CBC; Based on the 2021 International Building Code [IBC] and ASCE 7-16), Chapter 16 Structural Design, Section 1613 Earthquake Loads. We used SEAOC (2019) to determine the seismic design parameters. The short spectral response uses a period of 0.2 second. We evaluated the Site Class based on the discussion in Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7-16. The values presented herein are for the risk-targeted maximum considered earthquake (MCE_R). Sites designated as Site Class D, E and F may require additional analyses if requested by the project structural engineer and client.

TABLE 7.4.1
2022 CBC SEISMIC DESIGN PARAMETERS

Parameter	Value	2022 CBC Reference
Site Class	C	Section 1613.2.2
MCE_R Ground Motion Spectral Response Acceleration – Class B (short), S_S	1.100g	Figure 1613.2.1(1)
MCE_R Ground Motion Spectral Response Acceleration – Class B (1 sec), S_1	0.394g	Figure 1613.2.1(3)
Site Coefficient, F_A	1.2	Table 1613.2.3(1)
Site Coefficient, F_V	1.5	Table 1613.2.3(2)
Site Class Modified MCE_R Spectral Response Acceleration (short), S_{MS}	1.320g	Section 1613.2.3 (Eqn 16-20)
Site Class Modified MCE_R Spectral Response Acceleration – (1 sec), S_{M1}	0.590g	Section 1613.2.3 (Eqn 16-21)
5% Damped Design Spectral Response Acceleration (short), S_{DS}	0.880g	Section 1613.2.4 (Eqn 16-22)
5% Damped Design Spectral Response Acceleration (1 sec), S_{D1}	0.394g	Section 1613.2.4 (Eqn 16-23)

7.4.2 Per Section 11.4.8 of ASCE/SEI 7-16, a ground motion hazard analysis should be performed for projects for Site Class “E” sites with Ss greater than or equal to 1.0g and for Site Class “D” and “E” sites with S1 greater than 0.2g. The values presented in Table 6.4.1 can be used and the requirement for a ground motion hazard analysis can be waived provided the exceptions in Section 11.4.8 and Supplement 3 are followed.

7.4.3 Table 7.4.2 presents the maximum considered earthquake geometric mean peak ground acceleration (MCE_G) design parameters for projects located in Seismic Design Categories of D through F in accordance with ASCE 7-16.

TABLE 7.4.2
ASCE 7-16 PEAK GROUND ACCELERATION

Parameter	Value	ASCE 7-16 Reference
MCE_G Peak Ground Acceleration, PGA	0.478g	Figure 22-9
Site Coefficient, F_{PGA}	1.2	Table 11.8-1
Site Class Modified MCE_G Peak Ground Acceleration, PGA_M	0.574g	Section 11.8.3 (Eqn 11.8-1)

7.4.4 Conformance to the criteria in Tables 7.4.1 and 7.4.2 for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur in the event of a large earthquake. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.4.5 The project structural engineer and architect should evaluate the appropriate Risk Category and Seismic Design Category for the planned structures. The values presented herein assume a Risk Category of II and resulting in a Seismic Design Category D. Table 7.4.3 presents a summary of the risk categories in accordance with ASCE 7-16.

TABLE 7.4.3
ASCE 7-16 RISK CATEGORIES

Risk Category	Building Use	Examples
I	Low risk to Human Life at Failure	Barn, Storage Shelter
II	Nominal Risk to Human Life at Failure (Buildings Not Designated as I, III or IV)	Residential, Commercial and Industrial Buildings
III	Substantial Risk to Human Life at Failure	Theaters, Lecture Halls, Dining Halls, Schools, Prisons, Small Healthcare Facilities, Infrastructure Plants, Storage for Explosives/Toxins
IV	Essential Facilities	Hazardous Material Facilities, Hospitals, Fire and Rescue, Emergency Shelters, Police Stations, Power Stations, Aviation Control Facilities, National Defense, Water Storage

7.5 Preliminary Foundation Recommendations

7.5.1 Provided the grading is performed as recommended, structures can be supported on shallow foundation systems bearing on compacted fill or native old alluvium or granitic rock. Table 7.5 provides preliminary recommendations. An update geotechnical report should be prepared providing final foundation recommendations once structure type and locations are known.

TABLE 7.5
SUMMARY OF PRELIMINARY FOUNDATION RECOMMENDATIONS
FOR SHALLOW FOOTINGS

Parameter	Value
Minimum Continuous Foundation Width, W_C	12 inches
Minimum Isolated Foundation Width, W_I	24 inches
Minimum Foundation Depth, D	18 Inches Below Lowest Adjacent Grade
Minimum Concrete Reinforcement	4 No. 5 Bars, 2 at the Top and 2 at the Bottom
Allowable Bearing Capacity	2,000 psf
Bearing Capacity Increase	500 psf per Foot of Depth
	300 psf per Foot of Width
Maximum Allowable Bearing Capacity	4,000 psf
Estimated Total Static Settlement	1 Inch
Estimated Differential Static Settlement	½ Inch in 40 Feet
Footing Size Used for Settlement	6-Foot Square
Design Expansion Index	50 or less

7.6 Site Drainage and Moisture Protection

7.6.1 Adequate site drainage is critical to reduce the potential for differential soil movement, erosion and subsurface seepage. Under no circumstances should water be allowed to pond adjacent to footings. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2022 CBC 1803.3 or other applicable standards. In addition, surface drainage should be directed away from the top of slopes into swales or other controlled drainage devices. Roof and pavement drainage should be directed into conduits that carry runoff away from the proposed structure.

7.6.2 In the case of basement walls or building walls retaining landscaping areas, a water-proofing system should be used on the wall and joints, and a Miradrain drainage panel (or similar) should be placed over the waterproofing. The project architect or civil engineer should provide detailed specifications on the plans for all waterproofing and drainage.

7.6.3 Underground utilities should be leak free. Utility and irrigation lines should be checked periodically for leaks and detected leaks should be repaired promptly. Detrimental soil movement could occur if water is allowed to infiltrate the soil for prolonged periods of time.

7.6.4 Landscaping planters adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement subgrade and base course. We recommend that subdrains to collect excess irrigation water and transmit it to drainage structures, or impervious above-grade planter boxes be used. In addition, where landscaping is planned adjacent to the pavement, we recommend construction of a cutoff wall along the edge of the pavement that extends at least 6 inches below the bottom of the base material.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

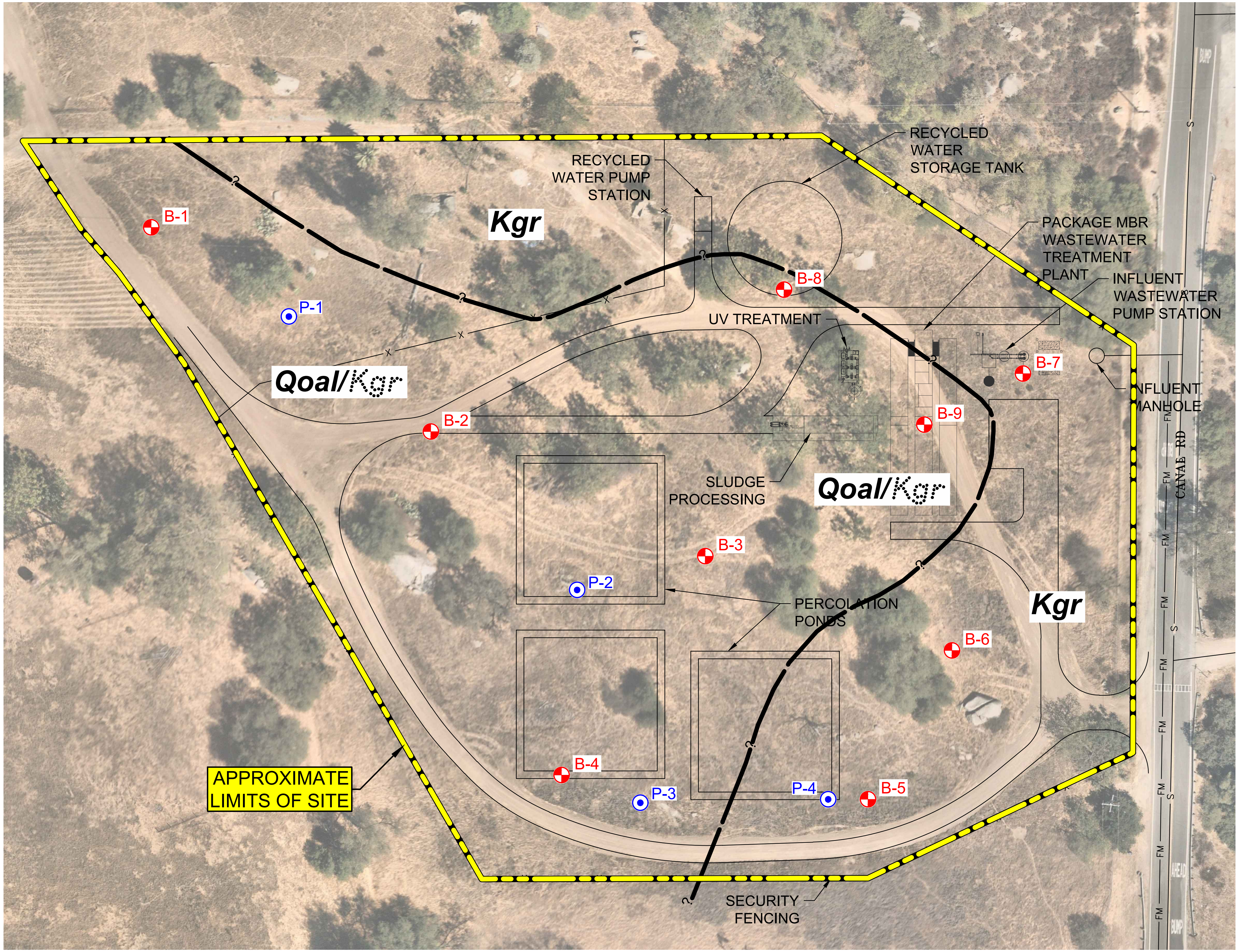
1. The conclusions and recommendations presented in this report are based on a review of available published information and performance of a site reconnaissance. In this regard, no subsurface investigation was conducted. As a consequence, the Client should recognize that this information is preliminary and our conclusions and recommendations could change significantly once a subsurface investigation is performed and the actual site conditions are identified.

2. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

3. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

4. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

SAN PASQUAL WWTP
SAN DIEGO COUNTY, CALIFORNIA



0' 30' 60' 90' 120'
SCALE 1"=60'(on 11x17)

GEOCON LEGEND

Qoal ....OLD ALLUVIUM
Kgr ....GRANITIC ROCK (Dotted Where Buried)
B-9 ....APPROX. LOCATION OF BORING
P-4 ....APPROX. LOCATION OF PECULATION TEST
........APPROX. LOCATION OF GEOLOGIC CONTACT (Queried Where Uncertain)

GEOCON INCORPORATED
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GEOLOGIC MAP

PROJECT NO. G3081 - 42 - 01
FIGURE 1
DATE 03 - 30 - 2023

Plotted:03/30/2023 8:43AM | By:ALVIN LADRILLONO | File Location:Y:\PROJECTS\G3081-42-01 (San Pasqual WWTP)\SHEETS\G3081-42-01 Geo Map.dwg

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

We performed the field investigation on March 8, 2023. The investigation consisted of drilling nine, small-diameter borings and four, 8-inch-diameter, percolation test holes. The approximate locations of the exploratory borings and percolation tests are shown on Figure 1.

The geotechnical borings were drilled to depths of approximately 10.5 feet to 15.5 feet below existing grade using a truck-mounted, IR-300 drill rig equipped with hollow-stem augers. The percolation test holes were drilled to depths of 3 feet and 4 feet.

The soil conditions encountered in the borings were visually examined, classified, and logged in general accordance with American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D 2488). Logs of the exploratory borings are presented on Figures A-1 through A-9. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained.

BORING B 1

ELEV. (MSL.) **1644'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; abundant plant roots			
2	B1-1					15		
4				SC	**OLD ALLUVIUM** Medium dense, moist, brown, Clayey, fine to coarse SAND			
	B1-2					22		
6								
8					**GRANITIC ROCK (Kgr)** Weak, highly weathered, moist, brown, reddish brown and black, GRANITIC ROCK; excavates as Silty, fine to coarse SAND			
10	B1-3					82/9"		
12								
14								
	B1-4					50/4"		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-1,
Log of Boring B 1, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G3081-42-01

BORING B 2

ELEV. (MSL.) **1650'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B2-1			SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; some mica			
2	B2-2					13		
4	B2-3			SC	**OLD ALLUVIUM** Medium dense, moist, brown, Clayey, fine to coarse SAND	20		
8	B2-4			SM	**GRANITIC ROCK (Kgr)** Weak, weathered, dry, mottled white and light gray, GRANITIC ROCK; excavates as Silty, fine to coarse SAND			
10	B2-5					80/11"		
14	B2-6					50/3"		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-2,
Log of Boring B 2, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS

... SAMPLING UNSUCCESSFUL ... STANDARD PENETRATION TEST ... DRIVE SAMPLE (UNDISTURBED)

... DISTURBED OR BAG SAMPLE ... CHUNK SAMPLE ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 3

ELEV. (MSL.) 1661' DATE COMPLETED 03/08/2023

EQUIPMENT IR A-300 BY: N. BORJA

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose to medium dense, moist, dark brown, Silty, fine to medium SAND; some mica			
2	B3-1					34		
4				CL	**OLD ALLUVIUM** Stiff, moist, brown to dark brown, Sandy CLAY			
	B3-2					35		
6	B3-3							
8					**GRANITIC ROCK (Kgr)** Weak, weathered, damp, mottled light brown and black, GRANITIC ROCK; excavates as Silty, fine to medium SAND; some mica			
10	B3-4					50/5"		
12								
14								
	B3-5				-Poor recovery	50/3"		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-3,
Log of Boring B 3, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS
... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 4

ELEV. (MSL.) **1656'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; organic debris			
2	B4-1			SC	**OLD ALLUVIUM** Medium dense, moist, brown, Clayey, fine to coarse SAND	27		
4	B4-2					35		
6				SM	**GRANITIC ROCK (Kgr)** Weak to very weak, completely weathered, mottled black and reddish brown, GRANITIC ROCK; excavates to dense, Silty, fine to coarse SAND			
8								
10	B4-3					71		

BORING TERMINATED AT 11 FEET
Groundwater not encountered
Backfilled on 03/08/2023

Figure A-4,
Log of Boring B 4, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS
... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 5

ELEV. (MSL.) **1665'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B5-1			SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; micaceous			
2	B5-2				**GRANITIC ROCK (Kgr)** Weak, weathered, damp, mottled brown and light brown, GRANITIC ROCK; excavates as Silty, fine to medium SAND	39		
4								
	B5-3					86/11.5"		
6								
8								
10	B5-4					50/45		
12	B5-5							
14					-Becomes mottled white, light brown, and black			
	B5-6					50/3.5		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-5,
Log of Boring B 5, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 6

ELEV. (MSL.) **1667'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose to medium dense, moist, dark brown, Silty, fine to medium SAND; some mica			
2	B6-1					19		
4					-Becomes medium dense, brown to dark brown			
	B6-2					23		
6	B6-3							
8					**GRANITIC ROCK (Kgr)** Weak, weathered, damp, mottled light brown and black, GRANITIC ROCK; excavates as Silty, fine to medium SAND; few mica; no difficulty drilling			
10	B6-4				-Poor recovery at 10 feet sample	50/4.5"		
12								
14								
	B6-5					50/2"		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-6,
Log of Boring B 6, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS
... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

BORING B 7

ELEV. (MSL.) **1678'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0	B7-1			SM	**TOPSOIL** Loose to medium dense, moist, dark brown, Silty, fine to medium SAND			
2	B7-2				**GRANITIC ROCK (Kgr)** Weak, weathered, damp, mottled reddish brown and black, GRANITIC ROCK; excavates as Silty, fine to coarse SAND; micaceous	31		
4								
6	B7-3					59		
8					-Becomes mottle light brown, yellowish brown, and black			
10	B7-4					71/11"		

BORING TERMINATED AT 11 FEET
Groundwater not encountered
Backfilled on 03/08/2023

Figure A-7,
Log of Boring B 7, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS
... SAMPLING UNSUCCESSFUL
... STANDARD PENETRATION TEST
... DRIVE SAMPLE (UNDISTURBED)
... DISTURBED OR BAG SAMPLE
... CHUNK SAMPLE
... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. G3081-42-01

BORING B 8

ELEV. (MSL.) 1671' DATE COMPLETED 03/08/2023

EQUIPMENT IR A-300 BY: N. BORJA

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Medium dense, moist, dark brown, Silty, fine to medium SAND; some mica			
2	B8-1					25		
4				SC	**OLD ALLUVIUM** Medium dense, moist, brown, Clayey, fine to coarse SAND			
	B8-2					29		
6								
8					**GRANITIC ROCK (Kgr)** Weak, weathered, damp, mottled white, yellowish brown and black, GRANITIC ROCK; excavates as Silty, fine to medium SAND			
10	B8-3					50/4"		
12								
14								
	B8-4				-No recovery	50/1"		
					BORING TERMINATED AT 15.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-8,
Log of Boring B 8, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

BORING B 9

ELEV. (MSL.) **1674'** DATE COMPLETED **03/08/2023**

EQUIPMENT **IR A-300** BY: **N. BORJA**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; organic debris			
2				SC	**OLD ALLUVIUM** Medium dense, moist, brown, Clayey, fine to coarse SAND			
4								
	B1-2					21		
6					**GRANITIC ROCK (Kgr)** Weak, completely weathered, moist, mottled reddish brown and black, GRANITIC ROCK; excavates to medium dense, Silty, fine to coarse SAND			
8								
10	B1-3					50/3"		
					BORING TERMINATED AT 10.5 FEET Groundwater not encountered Backfilled on 03/08/2023			

Figure A-9,
Log of Boring B 9, Page 1 of 1

G3081-42-01.GPJ

SAMPLE SYMBOLS
- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR ... SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected samples were tested for gradation, expansion potential, and corrosion characteristics. The results of our laboratory tests are presented on the following tables and figures.

SUMMARY OF LABORATORY EXPANSION INDEX TEST RESULTS ASTM D 4829-03

Sample No.	Moisture Content		Dry Density (pcf)	Expansion Index	Expansion Classification
	Before Test (%)	After Test (%)			
B2-1	8.4	15.4	116.2	8	Very Low
B3-3	9.8	21.3	110.3	35	Low

SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS CALIFORNIA TEST NO. 417

Sample No.	Water-Soluble Sulfate (%)	Sulfate Exposure
B2-1	0.004	S0
B3-3	0.007	S0

SUMMARY OF LABORATORY WATER-SOLUBLE CHLORIDE ION CONTENT TEST RESULTS AASHTO TEST NO. T 291

Sample No.	Chloride Ion Content ppm (%)
B2-1	71 (0.007)
B3-3	62 (0.006)

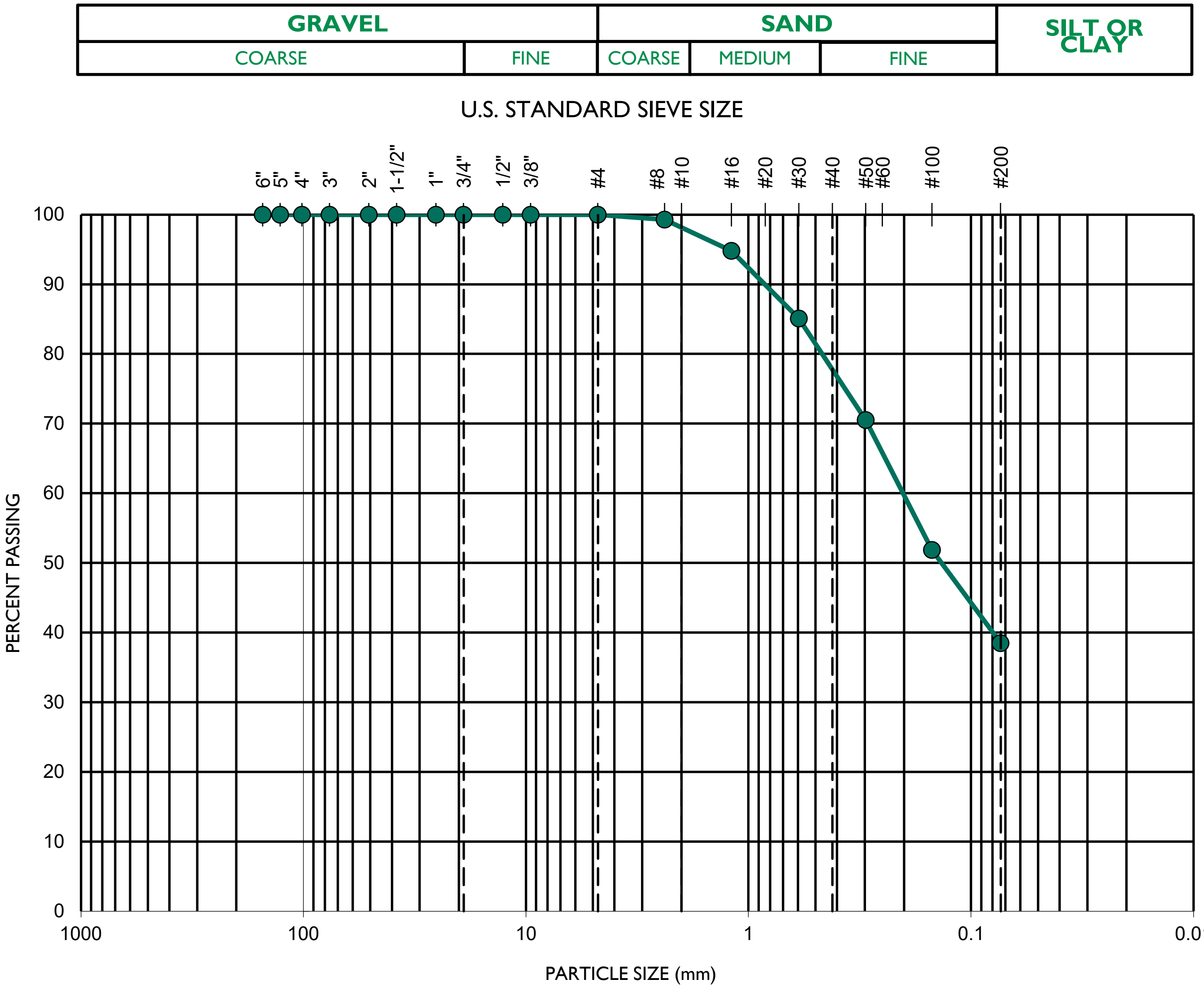
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (PH) AND RESISTIVITY TEST RESULTS CALIFORNIA TEST METHOD 643

Sample No.	pH	Minimum Resistivity (ohm-centimeters)
B2-1	7.70	8,300
B3-3	7.44	4,000

SAMPLE NO.: **B2-1**

SAMPLE DEPTH (FT.): **0' - 5'**

GEOLOGIC UNIT: **Topsoil**



TEST DATA					
D_{10} (mm)	D_{30} (mm)	D_{60} (mm)	C_c	C_u	SOIL DESCRIPTION
0.019	0.057	0.214	0.8	11.1	SM - Silty SAND

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SIEVE ANALYSES - ASTM D 6913

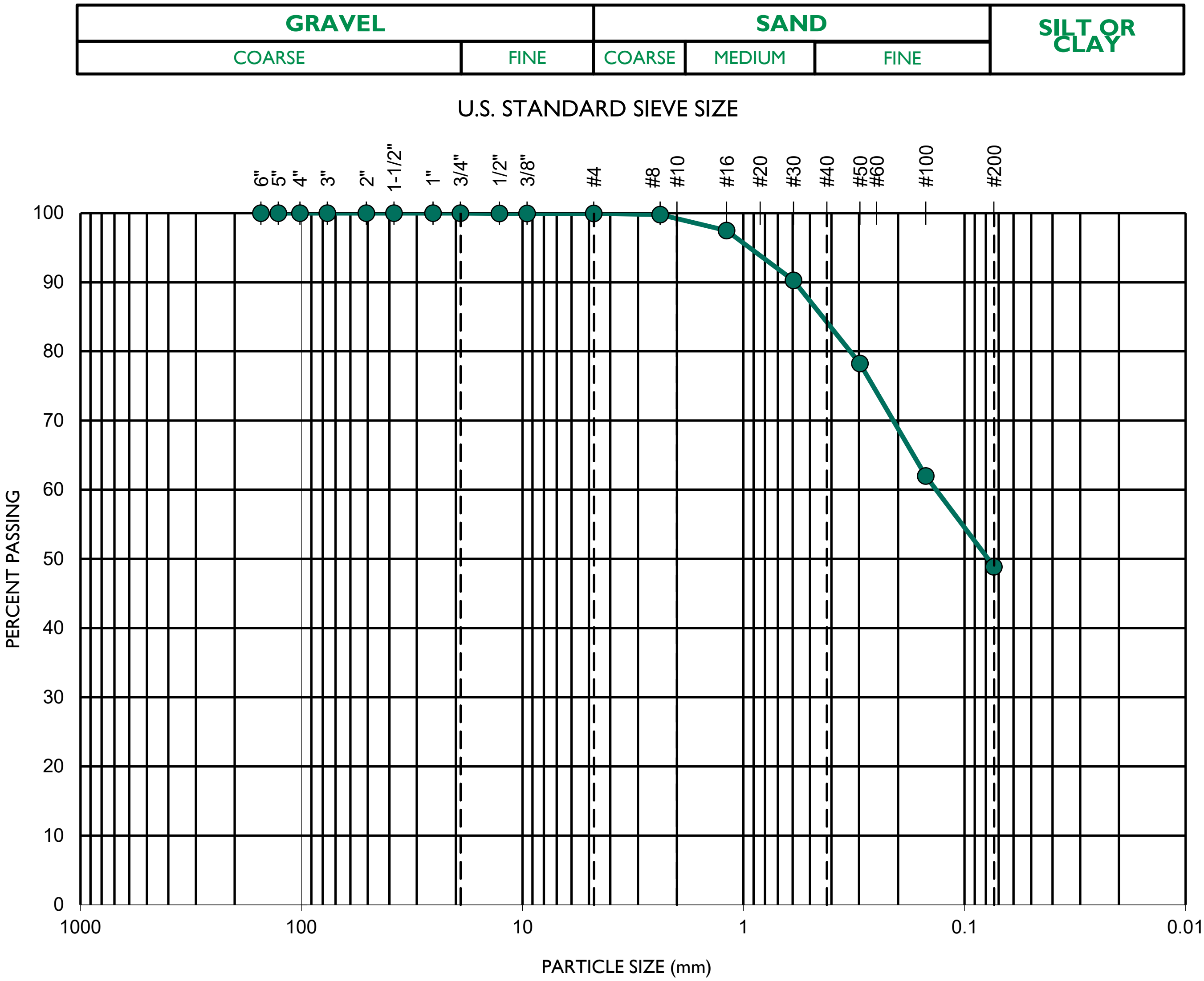
SAN PASQUAL WWTP

PROJECT NO.: G3081-42-01

SAMPLE NO.: **B3-3**

SAMPLE DEPTH (FT.): **5' - 10'**

GEOLOGIC UNIT: **Kgr**



TEST DATA					
D_{10} (mm)	D_{30} (mm)	D_{60} (mm)	C_c	C_u	SOIL DESCRIPTION
0.015	0.045	0.138	1.0	9.1	SM - Silty SAND

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SIEVE ANALYSES - ASTM D 6913

SAN PASQUAL WWTP

PROJECT NO.: G3081-42-01

APPENDIX C

RECOMMENDED GRADING SPECIFICATIONS

1. GENERAL

1.1 These Recommended Grading Specifications shall be used in conjunction with the Geotechnical Report for the project prepared by Geocon. The recommendations contained in the text of the Geotechnical Report are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict.

1.2 Prior to the commencement of grading, a geotechnical consultant (Consultant) shall be employed for the purpose of observing earthwork procedures and testing the fills for substantial conformance with the recommendations of the Geotechnical Report and these specifications. The Consultant should provide adequate testing and observation services so that they may assess whether, in their opinion, the work was performed in substantial conformance with these specifications. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that personnel may be scheduled accordingly.

1.3 It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans. If, in the opinion of the Consultant, unsatisfactory conditions such as questionable soil materials, poor moisture condition, inadequate compaction, and/or adverse weather result in a quality of work not in conformance with these specifications, the Consultant will be empowered to reject the work and recommend to the Owner that grading be stopped until the unacceptable conditions are corrected.

2. DEFINITIONS

2.1 **Owner** shall refer to the owner of the property or the entity on whose behalf the grading work is being performed and who has contracted with the Contractor to have grading performed.

2.2 **Contractor** shall refer to the Contractor performing the site grading work.

2.3 **Civil Engineer** or **Engineer of Work** shall refer to the California licensed Civil Engineer or consulting firm responsible for preparation of the grading plans, surveying and verifying as-graded topography.

2.4 **Consultant** shall refer to the soil engineering and engineering geology consulting firm retained to provide geotechnical services for the project.

2.5 **Soil Engineer** shall refer to a California licensed Civil Engineer retained by the Owner, who is experienced in the practice of geotechnical engineering. The Soil Engineer shall be responsible for having qualified representatives on-site to observe and test the Contractor's work for conformance with these specifications.

2.6 **Engineering Geologist** shall refer to a California licensed Engineering Geologist retained by the Owner to provide geologic observations and recommendations during the site grading.

2.7 **Geotechnical Report** shall refer to a soil report (including all addenda) which may include a geologic reconnaissance or geologic investigation that was prepared specifically for the development of the project for which these Recommended Grading Specifications are intended to apply.

3. MATERIALS

3.1 Materials for compacted fill shall consist of any soil excavated from the cut areas or imported to the site that, in the opinion of the Consultant, is suitable for use in construction of fills. In general, fill materials can be classified as *soil* fills, *soil-rock* fills or *rock* fills, as defined below.

3.1.1 **Soil fills** are defined as fills containing no rocks or hard lumps greater than 12 inches in maximum dimension and containing at least 40 percent by weight of material smaller than ¾ inch in size.

3.1.2 **Soil-rock fills** are defined as fills containing no rocks or hard lumps larger than 4 feet in maximum dimension and containing a sufficient matrix of soil fill to allow for proper compaction of soil fill around the rock fragments or hard lumps as specified in Paragraph 6.2. **Oversize rock** is defined as material greater than 12 inches.

3.1.3 **Rock fills** are defined as fills containing no rocks or hard lumps larger than 3 feet in maximum dimension and containing little or no fines. Fines are defined as material smaller than ¾ inch in maximum dimension. The quantity of fines shall be less than approximately 20 percent of the rock fill quantity.

3.2 Material of a perishable, spongy, or otherwise unsuitable nature as determined by the Consultant shall not be used in fills.

3.3 Materials used for fill, either imported or on-site, shall not contain hazardous materials as defined by the California Code of Regulations, Title 22, Division 4, Chapter 30, Articles 9 and 10; 40CFR; and any other applicable local, state or federal laws. The Consultant shall not be responsible for the identification or analysis of the potential presence of hazardous materials. However, if observations, odors or soil discoloration cause Consultant to suspect the presence of hazardous materials, the Consultant may request from the Owner the termination of grading operations within the affected area. Prior to resuming grading operations, the Owner shall provide a written report to the Consultant indicating that the suspected materials are not hazardous as defined by applicable laws and regulations.

3.4 The outer 15 feet of *soil-rock* fill slopes, measured horizontally, should be composed of properly compacted *soil* fill materials approved by the Consultant. *Rock* fill may extend to the slope face, provided that the slope is not steeper than 2:1 (horizontal:vertical) and a soil layer no thicker than 12 inches is track-walked onto the face for landscaping purposes. This procedure may be utilized provided it is acceptable to the governing agency, Owner and Consultant.

3.5 Samples of soil materials to be used for fill should be tested in the laboratory by the Consultant to determine the maximum density, optimum moisture content, and, where appropriate, shear strength, expansion, and gradation characteristics of the soil.

3.6 During grading, soil or groundwater conditions other than those identified in the Geotechnical Report may be encountered by the Contractor. The Consultant shall be notified immediately to evaluate the significance of the unanticipated condition.

4. CLEARING AND PREPARING AREAS TO BE FILLED

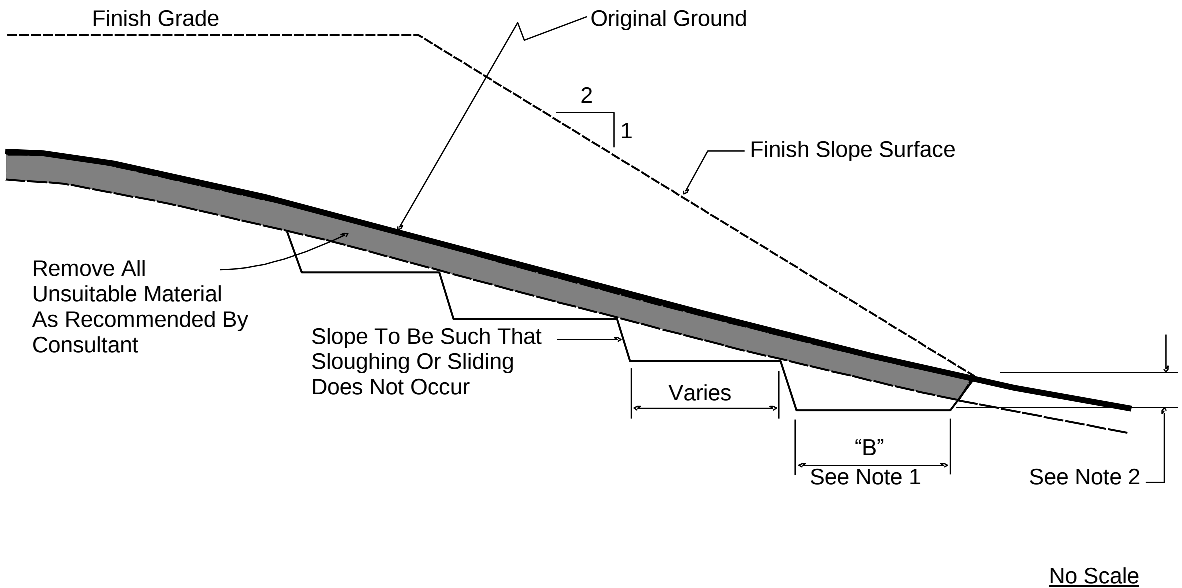
4.1 Areas to be excavated and filled shall be cleared and grubbed. Clearing shall consist of complete removal above the ground surface of trees, stumps, brush, vegetation, man-made structures, and similar debris. Grubbing shall consist of removal of stumps, roots, buried logs and other unsuitable material and shall be performed in areas to be graded. Roots and other projections exceeding 1½ inches in diameter shall be removed to a depth of 3 feet below the surface of the ground. Borrow areas shall be grubbed to the extent necessary to provide suitable fill materials.

4.2 Asphalt pavement material removed during clearing operations should be properly disposed at an approved off-site facility or in an acceptable area of the project evaluated by Geocon and the property owner. Concrete fragments that are free of reinforcing steel may be placed in fills, provided they are placed in accordance with Section 6.2 or 6.3 of this document.

4.3 After clearing and grubbing of organic matter and other unsuitable material, loose or porous soils shall be removed to the depth recommended in the Geotechnical Report. The depth of removal and compaction should be observed and approved by a representative of the Consultant. The exposed surface shall then be plowed or scarified to a minimum depth of 6 inches and until the surface is free from uneven features that would tend to prevent uniform compaction by the equipment to be used.

4.4 Where the slope ratio of the original ground is steeper than 5:1 (horizontal:vertical), or where recommended by the Consultant, the original ground should be benched in accordance with the following illustration.

TYPICAL BENCHING DETAIL



DETAIL NOTES: (1) Key width "B" should be a minimum of 10 feet, or sufficiently wide to permit complete coverage with the compaction equipment used. The base of the key should be graded horizontal, or inclined slightly into the natural slope.

(2) The outside of the key should be below the topsoil or unsuitable surficial material and at least 2 feet into dense formational material. Where hard rock is exposed in the bottom of the key, the depth and configuration of the key may be modified as approved by the Consultant.

4.5 After areas to receive fill have been cleared and scarified, the surface should be moisture conditioned to achieve the proper moisture content, and compacted as recommended in Section 6 of these specifications.

5. COMPACTION EQUIPMENT

5.1 Compaction of *soil* or *soil-rock* fill shall be accomplished by sheepsfoot or segmented-steel wheeled rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment. Equipment shall be of such a design that it will be capable of compacting the *soil* or *soil-rock* fill to the specified relative compaction at the specified moisture content.

5.2 Compaction of *rock* fills shall be performed in accordance with Section 6.3.

6. PLACING, SPREADING AND COMPACTION OF FILL MATERIAL

6.1 *Soil* fill, as defined in Paragraph 3.1.1, shall be placed by the Contractor in accordance with the following recommendations:

6.1.1 *Soil* fill shall be placed by the Contractor in layers that, when compacted, should generally not exceed 8 inches. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to obtain uniformity of material and moisture in each layer. The entire fill shall be constructed as a unit in nearly level lifts. Rock materials greater than 12 inches in maximum dimension shall be placed in accordance with Section 6.2 or 6.3 of these specifications.

6.1.2 In general, the *soil* fill shall be compacted at a moisture content at or above the optimum moisture content as determined by ASTM D 1557.

6.1.3 When the moisture content of *soil* fill is below that specified by the Consultant, water shall be added by the Contractor until the moisture content is in the range specified.

6.1.4 When the moisture content of the *soil* fill is above the range specified by the Consultant or too wet to achieve proper compaction, the *soil* fill shall be aerated by the Contractor by blading/mixing, or other satisfactory methods until the moisture content is within the range specified.

6.1.5 After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted by the Contractor to a relative compaction of at least 90 percent. Relative compaction is defined as the ratio (expressed in percent) of the in-place dry density of the compacted fill to the maximum laboratory dry density as determined in accordance with ASTM D 1557. Compaction shall be continuous over the entire area, and compaction equipment shall make sufficient passes so that the specified minimum relative compaction has been achieved throughout the entire fill.

6.1.6 Where practical, soils having an Expansion Index greater than 50 should be placed at least 3 feet below finish pad grade and should be compacted at a moisture content generally 2 to 4 percent greater than the optimum moisture content for the material.

6.1.7 Properly compacted *soil* fill shall extend to the design surface of fill slopes. To achieve proper compaction, it is recommended that fill slopes be over-built by at least 3 feet and then cut to the design grade. This procedure is considered preferable to track-walking of slopes, as described in the following paragraph.

6.1.8 As an alternative to over-building of slopes, slope faces may be back-rolled with a heavy-duty loaded sheepsfoot or vibratory roller at maximum 4-foot fill height intervals. Upon completion, slopes should then be track-walked with a D-8 dozer or similar equipment, such that a dozer track covers all slope surfaces at least twice.

6.2 *Soil-rock* fill, as defined in Paragraph 3.1.2, shall be placed by the Contractor in accordance with the following recommendations:

6.2.1 Rocks larger than 12 inches but less than 4 feet in maximum dimension may be incorporated into the compacted *soil* fill, but shall be limited to the area measured 15 feet minimum horizontally from the slope face and 5 feet below finish grade or 3 feet below the deepest utility, whichever is deeper.

6.2.2 Rocks or rock fragments up to 4 feet in maximum dimension may either be individually placed or placed in windrows. Under certain conditions, rocks or rock fragments up to 10 feet in maximum dimension may be placed using similar methods. The acceptability of placing rock materials greater than 4 feet in maximum dimension shall be evaluated during grading as specific cases arise and shall be approved by the Consultant prior to placement.

6.2.3 For individual placement, sufficient space shall be provided between rocks to allow for passage of compaction equipment.

6.2.4 For windrow placement, the rocks should be placed in trenches excavated in properly compacted *soil* fill. Trenches should be approximately 5 feet wide and 4 feet deep in maximum dimension. The voids around and beneath rocks should be filled with approved granular soil having a Sand Equivalent of 30 or greater and should be compacted by flooding. Windrows may also be placed utilizing an "open-face" method in lieu of the trench procedure, however, this method should first be approved by the Consultant.

6.2.5 Windrows should generally be parallel to each other and may be placed either parallel to or perpendicular to the face of the slope depending on the site geometry. The minimum horizontal spacing for windrows shall be 12 feet center-to-center with a 5-foot stagger or offset from lower courses to next overlying course. The minimum vertical spacing between windrow courses shall be 2 feet from the top of a lower windrow to the bottom of the next higher windrow.

6.2.6 Rock placement, fill placement and flooding of approved granular soil in the windrows should be continuously observed by the Consultant.

6.3 *Rock* fills, as defined in Section 3.1.3, shall be placed by the Contractor in accordance with the following recommendations:

6.3.1 The base of the *rock* fill shall be placed on a sloping surface (minimum slope of 2 percent). The surface shall slope toward suitable subdrainage outlet facilities. The *rock* fills shall be provided with subdrains during construction so that a hydrostatic pressure buildup does not develop. The subdrains shall be permanently connected to controlled drainage facilities to control post-construction infiltration of water.

6.3.2 *Rock* fills shall be placed in lifts not exceeding 3 feet. Placement shall be by rock trucks traversing previously placed lifts and dumping at the edge of the currently placed lift. Spreading of the *rock* fill shall be by dozer to facilitate *seating* of the rock. The *rock* fill shall be watered heavily during placement. Watering shall consist of water trucks traversing in front of the current rock lift face and spraying water continuously during rock placement. Compaction equipment with compactive energy comparable to or greater than that of a 20-ton steel vibratory roller or other compaction equipment providing suitable energy to achieve the required compaction or deflection as recommended in Paragraph 6.3.3 shall be utilized. The number of passes to be made should be determined as described in Paragraph 6.3.3. Once a *rock* fill lift has been covered with *soil* fill, no additional *rock* fill lifts will be permitted over the *soil* fill.

6.3.3 Plate bearing tests, in accordance with ASTM D 1196, may be performed in both the compacted *soil* fill and in the *rock* fill to aid in determining the required minimum number of passes of the compaction equipment. If performed, a minimum of three plate bearing tests should be performed in the properly compacted *soil* fill (minimum relative compaction of 90 percent). Plate bearing tests shall then be performed on areas of *rock* fill having two passes, four passes and six passes of the compaction equipment, respectively. The number of passes required for the *rock* fill shall be determined by comparing the results of the plate bearing tests for the *soil* fill and the *rock* fill and by evaluating the deflection variation with number of passes. The required number of passes of the compaction equipment will be performed as necessary until the plate bearing deflections are equal to or less than that determined for the properly compacted *soil* fill. In no case will the required number of passes be less than two.

6.3.4 A representative of the Consultant should be present during *rock* fill operations to observe that the minimum number of "passes" have been obtained, that water is being properly applied and that specified procedures are being followed. The actual number of plate bearing tests will be determined by the Consultant during grading.

6.3.5 Test pits shall be excavated by the Contractor so that the Consultant can state that, in their opinion, sufficient water is present and that voids between large rocks are properly filled with smaller rock material. In-place density testing will not be required in the *rock* fills.

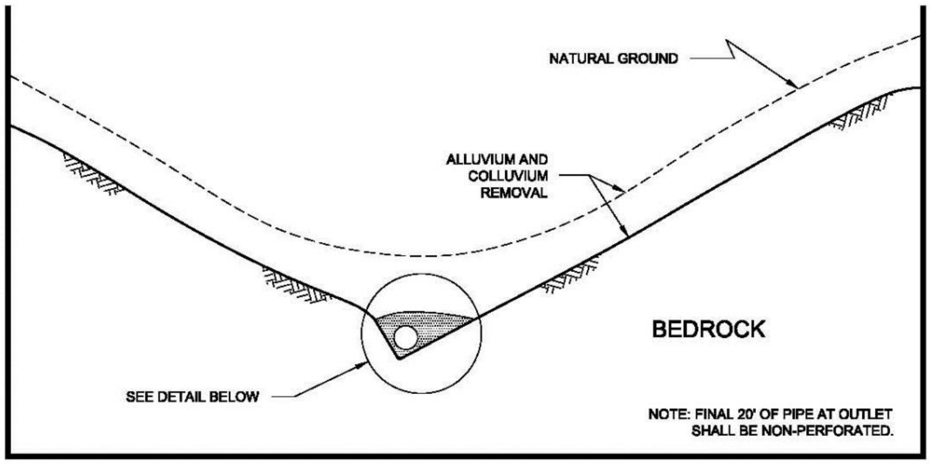
6.3.6 To reduce the potential for "piping" of fines into the *rock* fill from overlying *soil* fill material, a 2-foot layer of graded filter material shall be placed above the uppermost lift of *rock* fill. The need to place graded filter material below the *rock* should be determined by the Consultant prior to commencing grading. The gradation of the graded filter material will be determined at the time the *rock* fill is being excavated. Materials typical of the *rock* fill should be submitted to the Consultant in a timely manner, to allow design of the graded filter prior to the commencement of *rock* fill placement.

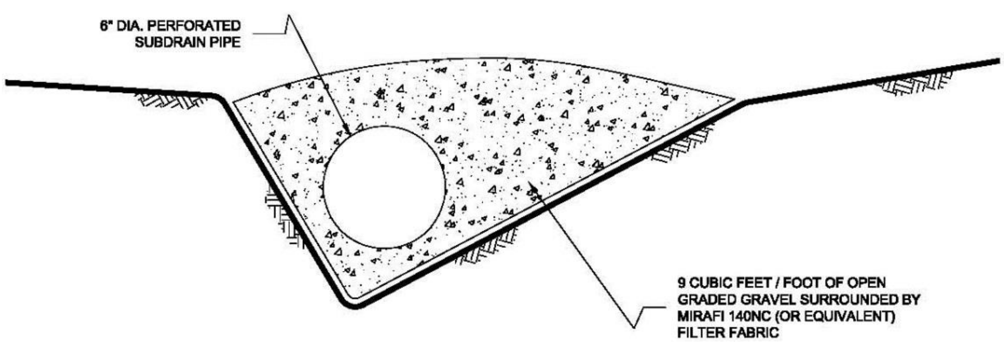
6.3.7 *Rock* fill placement should be continuously observed during placement by the Consultant.

7. SUBDRAINS

7.1 The geologic units on the site may have permeability characteristics and/or fracture systems that could be susceptible under certain conditions to seepage. The use of canyon subdrains may be necessary to mitigate the potential for adverse impacts associated with seepage conditions. Canyon subdrains with lengths in excess of 500 feet or extensions of existing offsite subdrains should use 8-inch-diameter pipes. Canyon subdrains less than 500 feet in length should use 6-inch-diameter pipes.

TYPICAL CANYON DRAIN DETAIL





NOTES:

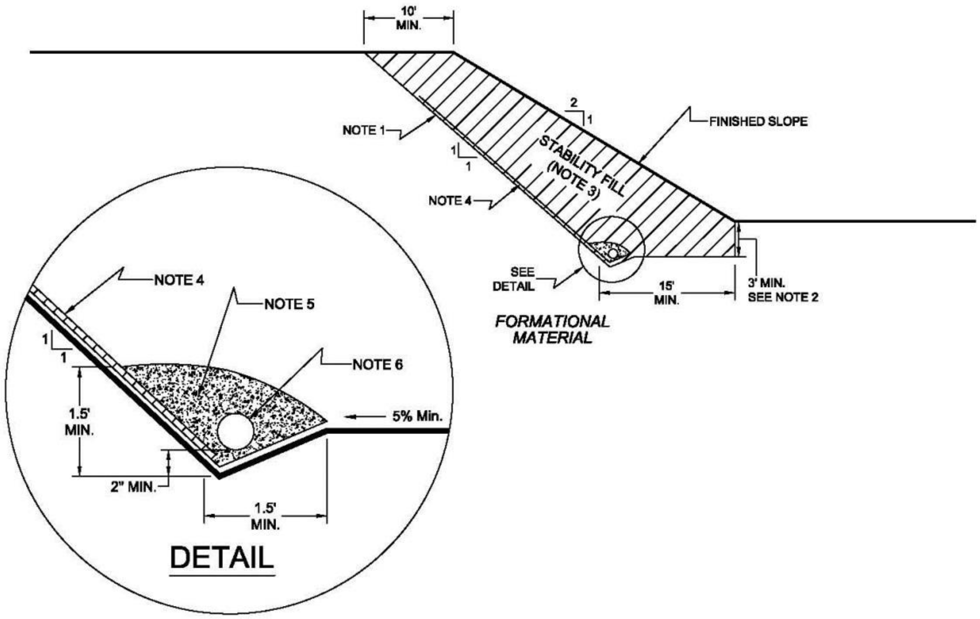
1......6-INCH DIAMETER, SCHEDULE 80 PVC PERFORATED PIPE FOR FILLS IN EXCESS OF 100-FEET IN DEPTH OR A PIPE LENGTH OF LONGER THAN 500 FEET.

2......6-INCH DIAMETER, SCHEDULE 40 PVC PERFORATED PIPE FOR FILLS LESS THAN 100-FEET IN DEPTH OR A PIPE LENGTH SHORTER THAN 500 FEET.

NO SCALE

7.2 Slope drains within stability fill keyways should use 4-inch-diameter (or lager) pipes.

TYPICAL STABILITY FILL DETAIL



NOTES:

1.....EXCAVATE BACKCUT AT 1:1 INCLINATION (UNLESS OTHERWISE NOTED).

2.....BASE OF STABILITY FILL TO BE 3 FEET INTO FORMATIONAL MATERIAL, SLOPING A MINIMUM 5% INTO SLOPE.

3.....STABILITY FILL TO BE COMPOSED OF PROPERLY COMPACTED GRANULAR SOIL.

4.....CHIMNEY DRAINS TO BE APPROVED PREFABRICATED CHIMNEY DRAIN PANELS (MIRADRAIN G200N OR EQUIVALENT) SPACED APPROXIMATELY 20 FEET CENTER TO CENTER AND 4 FEET WIDE. CLOSER SPACING MAY BE REQUIRED IF SEEPAGE IS ENCOUNTERED.

5.....FILTER MATERIAL TO BE 3/4-INCH, OPEN-GRADED CRUSHED ROCK ENCLOSED IN APPROVED FILTER FABRIC (MIRAFI 140NC).

6.....COLLECTOR PIPE TO BE 4-INCH MINIMUM DIAMETER, PERFORATED, THICK-WALLED PVC SCHEDULE 40 OR EQUIVALENT, AND SLOPED TO DRAIN AT 1 PERCENT MINIMUM TO APPROVED OUTLET.

NO SCALE

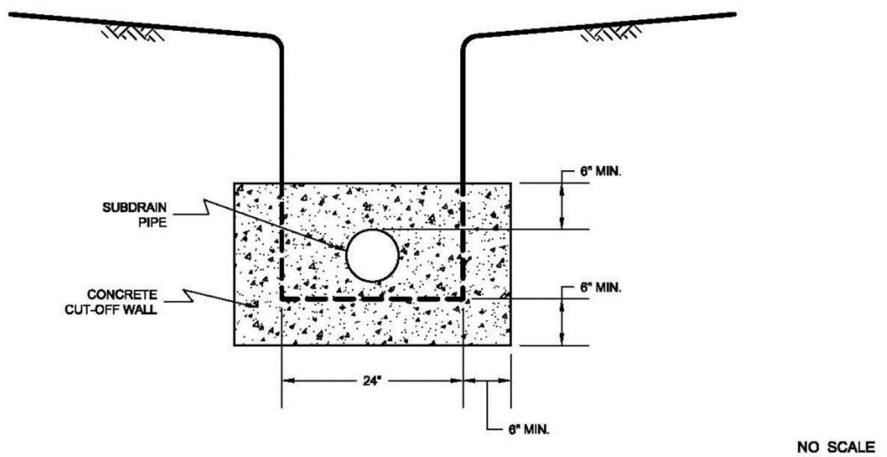
7.3 The actual subdrain locations will be evaluated in the field during the remedial grading operations. Additional drains may be necessary depending on the conditions observed and the requirements of the local regulatory agencies. Appropriate subdrain outlets should be evaluated prior to finalizing 40-scale grading plans.

7.4 *Rock* fill or *soil-rock* fill areas may require subdrains along their down-slope perimeters to mitigate the potential for buildup of water from construction or landscape irrigation. The subdrains should be at least 6-inch-diameter pipes encapsulated in gravel and filter fabric. *Rock* fill drains should be constructed using the same requirements as canyon subdrains.

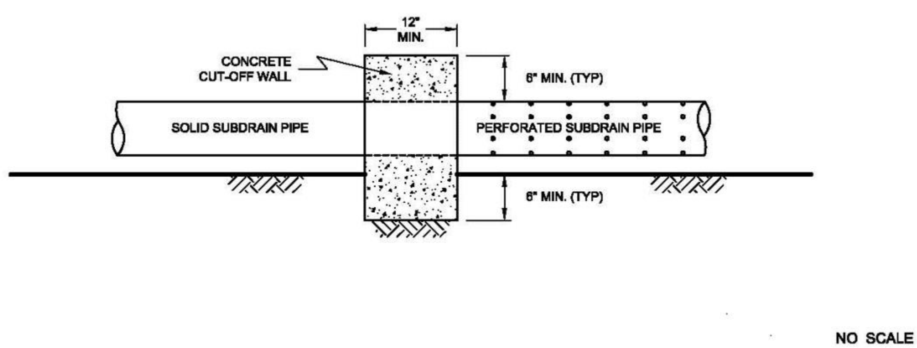
7.5 Prior to outletting, the final 20-foot segment of a subdrain that will not be extended during future development should consist of non-perforated drainpipe. At the non-perforated/ perforated interface, a seepage cutoff wall should be constructed on the downslope side of the pipe.

TYPICAL CUT OFF WALL DETAIL

FRONT VIEW

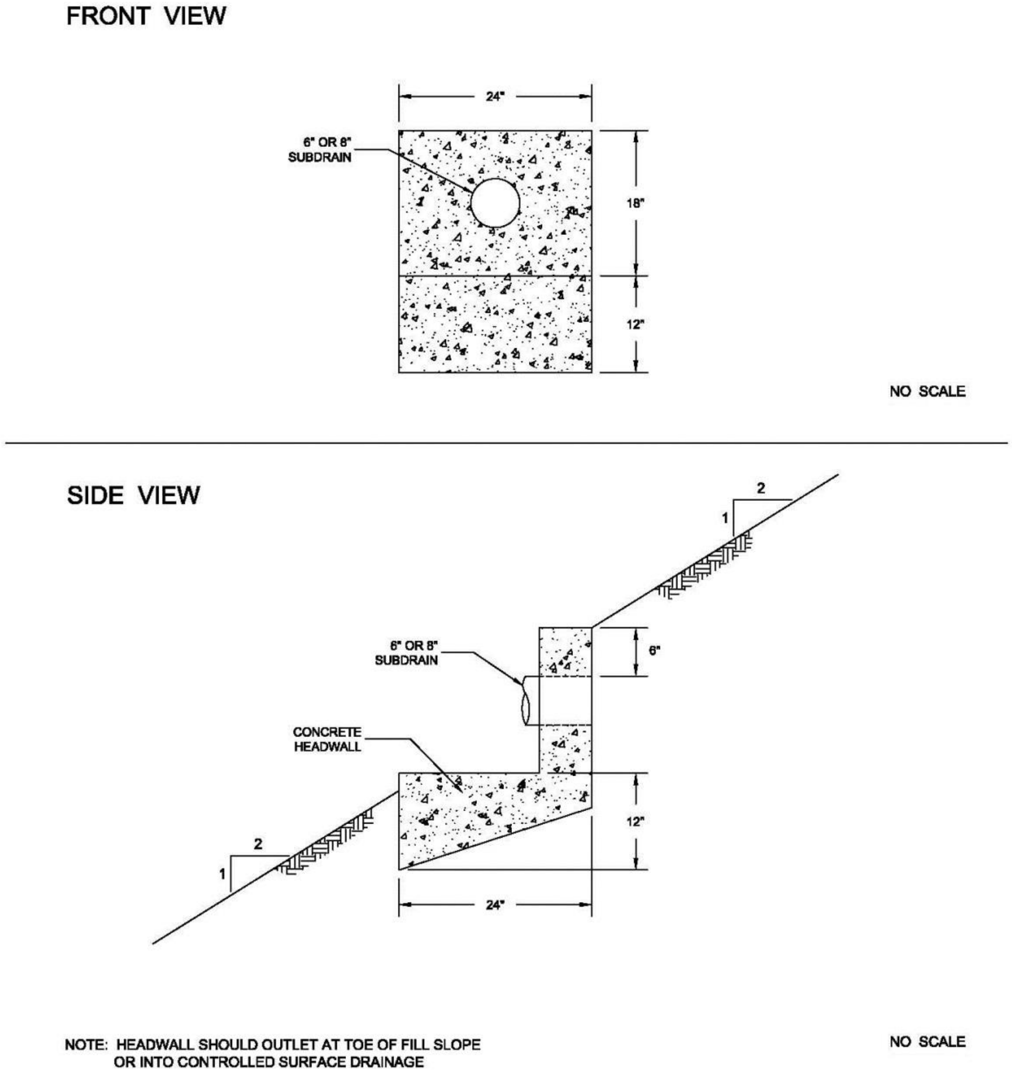


SIDE VIEW



7.6 Subdrains that discharge into a natural drainage course or open space area should be provided with a permanent headwall structure.

TYPICAL HEADWALL DETAIL



7.7 The final grading plans should show the location of the proposed subdrains. After completion of remedial excavations and subdrain installation, the project civil engineer should survey the drain locations and prepare an "as-built" map showing the drain locations. The final outlet and connection locations should be determined during grading operations. Subdrains that will be extended on adjacent projects after grading can be placed on formational material and a vertical riser should be placed at the end of the subdrain. The grading contractor should consider videoing the subdrains shortly after burial to check proper installation and functionality. The contractor is responsible for the performance of the drains.

8. OBSERVATION AND TESTING

8.1 The Consultant shall be the Owner's representative to observe and perform tests during clearing, grubbing, filling, and compaction operations. In general, no more than 2 feet in vertical elevation of *soil* or *soil-rock* fill should be placed without at least one field density test being performed within that interval. In addition, a minimum of one field density test should be performed for every 2,000 cubic yards of *soil* or *soil-rock* fill placed and compacted.

8.2 The Consultant should perform a sufficient distribution of field density tests of the compacted *soil* or *soil-rock* fill to provide a basis for expressing an opinion whether the fill material is compacted as specified. Density tests shall be performed in the compacted materials below any disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof is below that specified, the particular layer or areas represented by the test shall be reworked until the specified density has been achieved.

8.3 During placement of *rock* fill, the Consultant should observe that the minimum number of passes have been obtained per the criteria discussed in Section 6.3.3. The Consultant should request the excavation of observation pits and may perform plate bearing tests on the placed *rock* fills. The observation pits will be excavated to provide a basis for expressing an opinion as to whether the *rock* fill is properly seated and sufficient moisture has been applied to the material. When observations indicate that a layer of *rock* fill or any portion thereof is below that specified, the affected layer or area shall be reworked until the *rock* fill has been adequately seated and sufficient moisture applied.

8.4 A settlement monitoring program designed by the Consultant may be conducted in areas of *rock* fill placement. The specific design of the monitoring program shall be as recommended in the Conclusions and Recommendations section of the project Geotechnical Report or in the final report of testing and observation services performed during grading.

8.5 We should observe the placement of subdrains, to check that the drainage devices have been placed and constructed in substantial conformance with project specifications.

8.6 Testing procedures shall conform to the following Standards as appropriate:

8.6.1 Soil and Soil-Rock Fills:

8.6.1.1 Field Density Test, ASTM D 1556, *Density of Soil In-Place By the Sand-Cone Method.*

8.6.1.2 Field Density Test, Nuclear Method, ASTM D 6938, *Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).*

8.6.1.3 Laboratory Compaction Test, ASTM D 1557, *Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Pound Hammer and 18-Inch Drop.*

8.6.1.4. Expansion Index Test, ASTM D 4829, *Expansion Index Test*.

9. PROTECTION OF WORK

9.1 During construction, the Contractor shall properly grade all excavated surfaces to provide positive drainage and prevent ponding of water. Drainage of surface water shall be controlled to avoid damage to adjoining properties or to finished work on the site. The Contractor shall take remedial measures to prevent erosion of freshly graded areas until such time as permanent drainage and erosion control features have been installed. Areas subjected to erosion or sedimentation shall be properly prepared in accordance with the Specifications prior to placing additional fill or structures.

9.2 After completion of grading as observed and tested by the Consultant, no further excavation or filling shall be conducted except in conjunction with the services of the Consultant.

10. CERTIFICATIONS AND FINAL REPORTS

10.1 Upon completion of the work, Contractor shall furnish Owner a certification by the Civil Engineer stating that the lots and/or building pads are graded to within 0.1 foot vertically of elevations shown on the grading plan and that all tops and toes of slopes are within 0.5 foot horizontally of the positions shown on the grading plans. After installation of a section of subdrain, the project Civil Engineer should survey its location and prepare an *as-built* plan of the subdrain location. The project Civil Engineer should verify the proper outlet for the subdrains and the Contractor should ensure that the drain system is free of obstructions.

10.2 The Owner is responsible for furnishing a final as-graded soil and geologic report satisfactory to the appropriate governing or accepting agencies. The as-graded report should be prepared and signed by a California licensed Civil Engineer experienced in geotechnical engineering and by a California Certified Engineering Geologist, indicating that the geotechnical aspects of the grading were performed in substantial conformance with the Specifications or approved changes to the Specifications.

LIST OF REFERENCES

CGS (2021a), *EQ Zapp: California Earthquake Hazards Zone Application*, web application that queries California Geological Survey mapped earthquake hazard zones, https://www.conservation.ca.gov/cgs/geohazards/eq-zapp, accessed March 24, 2023;

CGS (2021b), *California Tsunami Maps and Data*, web application for accessing tsunami inundation hazard, https://www.conservation.ca.gov/cgs/tsunami/maps, accessed March 24, 2023;

FEMA (2019), *Flood Map Service Center*, FEMA website, https://msc.fema.gov/portal/home, flood map number 06073C1613H, effective December 20, 2019, accessed March 27, 2023;

SEAOC (2020), *Seismic Design Maps*, website interface that queries the U.S. Geological Survey (USGS) web servers and retrieves the seismic design variables using ASCE 7-16, ASCE 7-10, ASCE 41-13, ASCE 41-17, IBC 2015, IBC 2012, NEHRP-2015, and NEHRP 2009 seismic design map data, http://seismicmaps.org; accessed March 27, 2023;

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USGS (2019), *Quaternary Fault and Fold Database of the United States*: U.S. Geological Survey website, https://www.usgs.gov/natural-hazards/earthquake-hazards/faults, accessed March 23, 2023;

Appendix C – Floodplain Report

SAN PASQUAL BAND OF MISSION INDIANS

COMMUNITY SEWER SYSTEM

TASK ORDER #2.4

FLOODPLAIN ANALYSIS

Prepared For:
John Flores
Environmental Director & Domestic Water Manager
San Pasqual Band of Mission Indians
16400 Kumeyaay Way
Valley Center, California 92082

Prepared By:

Kimley»Horn

Richard Lucera, PE
Kimley-Horn and Associates, Inc.
401 B Street, Suite 600
San Diego, CA 92101

October, 2024

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This Floodplain Analysis has been prepared by Kimley-Horn and Associates, Inc. under the direct supervision of the following Registered Civil engineer. The undersigned attests to the technical data contained in this study, and to the qualifications of technical specialists providing engineering computations upon which the recommendations and conclusions are based.

Richard Lucera, PE Registered Civil Engineer	October 23, 2024 Date

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Abbreviations

BFE	Base Flood Elevation
CAD	Computer-Aided Design
CFS	Cubic Feet Per Second
DPW	Department of Public Works
EO	Executive Order
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FFRMS	Federal Flood Risk Management Standard
FT	Feet
GIS	Geographic Information System
HSG	Hydrologic Soil Group
IHS	Indian Health Service
KHA	Kimley-Horn and Associates
NEH	National Engineering Handbook
NLCD	National Land Cover Database
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NAD	North American Datum of 1983
NAVD	North American Vertical Datum of 1988
SFHA	Special Flood Hazard Area
TR-55	USDA NRCS Technical Release 55
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WSEL	Water Surface Elevation
WWTP	Wastewater Treatment Plant

1 EXECUTIVE SUMMARY

This report analyzes the Special Flood Hazard Area (SFHA) extents and water depth adjacent to the planned Wastewater Treatment Plant (WWTP) within the Land Trust of the San Pasqual Band of Mission Indians (hereinafter the Band). Executive Order 11988 requires Federal Agencies to implement processes for floodplain management and Executive Order 13690 established a new standard, the Federal Flood Risk Management Standard (FFRMS). Executive Order 13690 was revoked by Executive Order 13807 but reinstated by Executive Order 14030 on May 20th of 2021. FFRMS implements current and future risks to mitigate climate change related impacts and strengthen the country's infrastructure. Executive Order 11988 requires new development in a floodplain determined by FFRMS to follow a guidance document called the 8-Step Process for Decision Making for Projects within Floodplains. The Indian Health Service (IHS) is a Federal Health Program for American Indians and Alaska Natives under the U.S. Department of Health and Himan Services. The IHS funds and approves projects that contribute to improving the health of tribal communities. This study addresses Step #1 of the IHS 8-Step Process for Decision Making for Projects within Floodplains and its analysis follows FEMA's computational and flood mapping technical guidance and the FFRMS. The first step of the 8-step process is to identify floodplains in the project area. More information on the 8-Step process can be found in Section 5.

While a portion of the study area was previously studied by FEMA, the agency only creates and maintains floodplain studies within member communities within the National Flood Insurance Program, and thus the outcome of this report will not be used to revise the limits on FEMA's Flood Insurance Rate Map (FIRM), which was developed in partnership with the County of San Diego. Additionally, this analysis expands the analysis past the 100-year floodplain to include FFRMS. This modelling effort improves on FEMA's previous analysis in two ways: 1) it uses newer, more comprehensive survey data provided by the Band and 2) implements a two-dimensional (2D) hydraulic analysis in-lieu of the one-dimensional (1D) model used by FEMA. The US Army Corps of Engineers (USACE) recommends using 2D analyses for areas experiencing shallow unconfined flooding (USACE, 2020). Such areas characterize a significant portion of the study area.

Special Flood Hazard Areas delineated within or near the project site include:

1) Zone AE - floodplain limits resulting from the 1% annual chance event (aka 100-year storm). Zone AE floodplains are computationally derived and result in the determination of specific Base Flood Elevations (BFEs).
2) Zone AO - area of shallow, or unconfined flows and generally considered to be less than 3' depth.
3) Zone X (shaded) - area of potential flood risk, or the floodplain limits associated with the 0.2% annual chance event (aka 500-year storm).
4) Regulatory Floodway - the regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that is restricted from development due to increased risk. These areas must be reserved in order to discharge the 100-year Base Flood Elevation without cumulatively increasing the water surface elevation by more than 1-foot. Floodways are computationally derived through an encroachment analysis and are the primary tool used by most member communities to apply flood risk to the land planning process.

Existing data files were used to support this report's modelling efforts. USGS contours were used to develop drainage areas as part of the hydrology analysis, while a composite of site-specific 1' contour data provided by the Band and SanGIS were used for the hydraulic analysis. In some areas, the topographic information FEMA used to generate the effective FIRM conflicts with the elevations provided by the Band and SanGIS. This discrepancy makes it infeasible to directly utilize Base Flood Elevation data (BFE) developed by FEMA as the downstream boundary condition within this study. However, it is worth noting that the spatial limits from the base flood resulting from our analysis correlate well with those of FEMA at the downstream limit of work.

The hydrologic analysis in this study determined the drainage areas which contribute to the study area's seven stream reaches, and calculated the flow rates contributing to each. The hydrologic model analyzes both 100-year and 500-year storm conditions and includes a total of 10 drainage sub-areas. Hydrographs indicating flowrate over the storm duration were generated for each drainage sub-area and subsequently used as upstream boundary condition inflow within the hydraulic model. Results from this report's hydrologic model are found to be generally consistent with data provided in FEMA's March 22, 2022 revision of their Flood Insurance Study on a unitized basis.

The floodplain limits and Base Flood Elevations presented in this report suggest appropriate changes from the effective floodplain limits previously defined by FEMA and extend the delineation of Special Flood Hazard Areas (SFHAs) through and around District A. Differences can most likely be attributed to use of a 2D hydraulic model as well as application of newer and more accurate topographic data.

The proposed Wastewater Treatment Plant site is subject to fragmented and highly localized minor flooding during the 100-year storm event under the existing condition. Flood depths within the boundaries of the WWTP plant range from 0.00-0.65 feet. Maps showing the Special Flood Hazard Areas (SFHAs) resulting from the 100-year and 500-year storm events are included on Sheet 2 in **Appendix C** (Existing Condition Hydraulic Work Map)**.** Sheet 3 in **Appendix C** (Existing Condition with Encroachments Hydraulic Work Map) shows assumed encroachment limits used to computationally derive the resulting floodway.

The delineated floodway shown on Sheet 3 in **Appendix C** is intended to serve as a planning tool for the Band and, if followed diligently, can be used to aid the IHS 8-step process during future development. No development of any kind (i.e., placement of fill, buildings, structures, etc.) should occur within the floodway. Development within all other Special Flood Hazard Areas has been computationally accounted for through the floodway encroachment scenario within this analysis. **Figure 1** below shows 100-year storm flooding extents (blue) from the floodway encroachment scenario, with green shaded areas representing assumed encroachment limits. Base flood elevations range from 1642' to 1684' in areas surrounding the WWTP site (pink).

Figure 1: Base Flood Elevations Near the Proposed WWTP Site

Development in Special Flood Hazard Areas outside of the floodway (i.e., District A or elsewhere) is appropriate from the perspective of flood risk/flood impact provided that:

1) New structures are properly elevated (i.e., above Base Flood Elevations resulting from the "encroachment" modeling scenario); and
2) Project hydrology remains unchanged or is mitigated to pre-project conditions.

2 INTRODUCTION AND SCOPE

2.1 REPORT OBJECTIVES

The report objectives below are based on the client-approved scope of work for Task 4 of the San Pasqual Band of Mission Indians Community Sewer System Task Order 2 dated August 25, 2023.

1. Review and discuss the digital processing of existing data files available from FEMA and the San Pasqual Band of Mission Indians and their relevancy to this report's analysis and results.
2. Conduct a hydrologic analysis to develop peak flow rates for the stream reaches studied in the hydraulic model using the US Army Corps of Engineer's HEC-HMS software.
3. Perform hydraulic modeling in HEC-RAS to determine the spatial limits of Special Flood Hazard Areas.
4. Incorporate an encroachment analysis into the hydraulic model and use the results to delineate a regulatory floodway area.
5. Discuss model results and their relevancy to the IHS 8-Step Process for Decision Making for Projects within Floodplains.

2.2 REPORT LIMITATIONS

This report is subject to the following limitations, as stated within the client-approved scope of work for Task 4 of the San Pasqual Band of Mission Indians Community Sewer System Task Order 2 dated August 25, 2023.

- Submittals and coordination with County of San Diego Department of Public Works (DPW), FEMA, and all other public agencies are considered outside the scope of this work.
- This study is not a technical basis for FEMA MT-2 forms, Flood Insurance Rate Map (FIRM) Letter of Map Revision, or Conditional Letter of Map Revision.

2.3 PROJECT BACKGROUND

The San Pasqual Band of Mission Indians Reservation is located approximately three miles east of Valley Center, 40 miles north of San Diego, 12 miles from Escondido, and is 25 miles inland from the Pacific Ocean. The Reservation includes three separate, non-contiguous tracts identified as Districts A, B, and C. Each of the districts are labeled in **Figure 2** below.

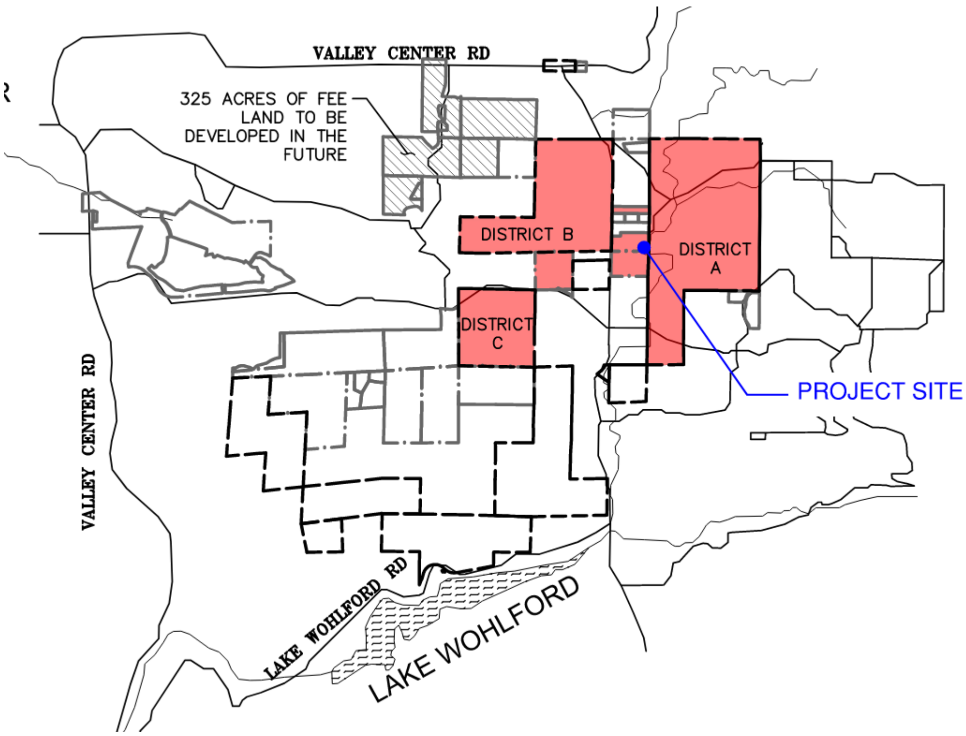

Figure 2: Vicinity Map

The San Pasqual Band of Mission Indians (hereinafter "The Band") intends to construct a Wastewater Treatment Plant (WWTP) as well as a community sewer system consisting of gravity pipe, lift stations, and force mains. The proposed action area is inclusive of the total areas of Districts A and B, as well as a portion of District C. The proposed WWTP site lies in what is currently fee land between Districts A and B and can be seen in the 2D Hydraulic Model Layout Map supplied on Sheet 1 in **Appendix C**.

This analysis focuses on riverine flood sources (Moosa Creek Upper Branch and associated unnamed tributaries) within and near District A, a total hydrologic model study area of 1.59 square miles. The hydraulic model area extends a distance of 2.5 miles from near Latigo Road (upstream) to just east of Bates Nut Farm downstream. Runoff collected in the Moosa Creek Upper Branch and associated tributaries generally travels from east to west across the study area.

2.4 USE OF EXISTING DATA FILES

Kimley Horn utilized the following topographic data files as part of this analysis:

1. 6-Meter Vertical Contour Interval Topography, Available Online Through USGS: Used to develop drainage subareas as part of the hydrology analysis.

2. 1-Foot Vertical Contour Interval Topography, Provided by The Band: Topography was generated from an undated aerial survey performed by NV5 Consultants on the NAVD ’88 vertical datum. The data is on State Plane NAD ’83 Coordinates California Zone 6 (ft). This information was used in the floodplain analysis to develop accurate flow depth and velocity through the study area and is considered the newest, most accurate information available to serve this purpose.

3. 2-Foot Vertical Contour Interval Topography, Available Online Through SanGIS Portal: This data was collected in 2014 by the National Geospatial Intelligence Agency in coordination with the San Diego Association of Governments and is used to supplement missing areas relevant to the study, outside the limit of the Band-provided topography. This information is also on State Plane NAD ’83 Zone 6 and NAVD ’88 vertical datum.

Special Flood Hazard Areas delineated within or near the project site include:

1) Zone AE - floodplain limits resulting from the 1% annual chance event (aka 100-year storm). Zone AE floodplains are computationally derived and result in the determination of specific Base Flood Elevations (BFEs).
2) Zone AO - area of shallow, or unconfined flows and generally considered to be less than 3' depth.
3) Zone X (shaded) - area of potential flood risk, or the floodplain limits associated with the 0.2% annual chance event (aka 500-year storm).
4) Regulatory Floodway - the regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that is restricted from development due to increased risk. These areas must be reserved in order to discharge the 100-year Base Flood Elevation without cumulatively increasing the water surface elevation by more than 1-foot. Floodways are computationally derived through an encroachment analysis and are the primary tool used by most member communities to apply flood risk to the land planning process.

Mapped SFHA’s can be seen in Flood Insurance Rate Map (FIRM) panels 06073C0828G and 06073C0829G, both published on May 16, 2012. A copy of these FIRM panels has been provided in **Appendix E**.

Base Flood Elevation data on the FIRM panels was reviewed for general consistency with topographic data provided by the Band as was from SanGIS. In many locations, elevations indicated in the site-specific topography were found to be higher than FEMA Base Flood Elevations. This condition suggests fairly widespread discrepancy between site specific topography versus the underlying topography in the FEMA analysis (since the underlying topography must be lower than the published Base Flood Elevation). A representative sample of this discrepancy is provided in **Table 1**. The significance of this condition is that Base Flood Elevations published by FEMA are not suitable to use as the downstream hydraulic tie in for floodplain computations (discussed in detail within Section 4).

Table 1: Examples of Elevation Discrepancies Between FEMA FIRM BFE's and Band/SanGIS Surface

Approximate Location	Band/SanGIS Surface Elevation (ft.)	FEMA BFE Contour Reading (ft.)	Minimum Difference Between Surfaces (ft.)
West of Canal Road on Moosa Creek North Branch	1653.1	1650	3.2
East of Private Road on Moosa Creek North Branch	1618	1610.5	7.5
West of Private Road on Moosa Creek North Branch	1592.6	1586.5	6.1
Southwest of Kunyaaw Path on Moosa Creek North Branch	1581.9	1579	2.9

3 HYDROLOGIC ANALYSIS

3.1 SITE VISIT

Kimley-Horn conducted a site visit of the hydrological study area on December 5, 2023. The purpose of the visit was to generally observe channel roughness as well as identify the shape, material, and dimensions of the Canal Road culvert. Field observations were used to determine the roughness values of the land cover for the hydrologic modelling, and the geometry of the culvert was input into the floodplain model. Photographs can be found in **Appendix D**.

3.2 MODEL INTRODUCTION

A hydrologic model was created using GeoHECHMS, a data wrapper to the US Army Corps of Engineer's Hydraulic Engineering Center Hydrologic Modeling System (HEC-HMS) v.4.5 to conform with FEMA's standards for numeric computational models and to ensure consistency with geospatial data files used in the analysis. The model was used to generate hydrographs for the 100-year and 500-year storms. The model includes a total of 10 subbasins which are shown in the Hydrologic Work Map in **Appendix A**. The runoff hydrograph generated at each node within the hydrologic model was input as an upstream boundary in the floodplain model. Additional information on this process is found in **Sections 3.4 and 4.2.5**.

3.3 HYDROLOGIC METHODOLOGY

This study's hydrologic analysis was performed using methodology described in the TR-55 document and the United States Department of Agriculture (USDA) NRCS National Engineering Handbook (NEH). Hydrologic calculations were performed in accordance with FEMA numeric modeling standards for hydrologic analysis.

3.3.1 RAINFALL

A rainfall distribution plot was generated within HEC-HMS using an NRCS Type 1 storm distribution, as recommended for Southern California. The Type 1 distribution incorporates rainfall duration-depth and depth-frequency rates from NOAA Atlas 14. The 24-hour rainfall totals for the 100 year and 500-year statistical frequencies respectively used were 7.05 and 9.33 inches.

3.3.2 SUBBASIN DELINEATION

The study area consists of a portion of the Moosa Canyon Subwatershed within the larger Lower San Luis Rey River Watershed. Drainage sub-areas were delineated based upon USGS Topographic contours and aerial imagery. In total, the 10 subbasins included within the hydrologic model encompass approximately 1.59 square miles. A hydrologic work map of sub-area boundaries, study nodes, and aerial imagery can be found in **Appendix A**.

3.3.3 LOSS RATES

Infiltration losses for each of the subbasins were calculated using the NRCS Curve Number Method. Curve Numbers were generated within HEC-HMS based on 2021 National Land Cover Database (NLCD) data and soil group data from the NCRS Soil Survey Database. Since each subbasin consists of several soil types and land uses, a composite Curve Number was calculated in HEC-HMS for each using a weighted average approach based on an individual area's relation to the total area of the subbasin. Curve Numbers reflect an average Antecedent Moisture Condition of II, consistent with TR-55 methodology.

3.3.4 TIME OF CONCENTRATION AND LAG TIME

NRCS lag time and time of concentration are calculated within the HEC HMS model. Lag time parameters such as channel roughness and slope were based upon USGS contours, review of aerial photos, and field investigation. Sub-areas were generally characterized with maximum sheet flow distances of 100 FT and shallow concentrated flow distances of 1000 FT. Both of these values are consistent with the conservative portion of ranges provided within TR-55 technical guidance.

3.3.5 CHANNEL ROUTING

Sufficiently large channels within the study area possess the ability to attenuate flow. To account for this effect, channel routing elements were incorporated into the model using the Muskingum Cunge method. Channel routing parameters such as roughness cross section, and celerity index are based on professional judgment and technical guidance from the US Army Corps of Engineers.

3.4 HYDROLOGIC RESULTS

The HEC-HMS 100-year and 500-year storm peak discharge outputs for each study node are shown in **Table 2. Appendix B** contains a supplementary hydrology report detailing the HEC-HMS model inputs and model results. The unsteady state hydrographs generated by the hydrologic model are used to introduce flow at hydraulic model upstream boundary conditions. The corresponding boundary condition for each study node is shown in the second column of the table below. Boundary condition locations can be seen in the 2D Hydraulic Model Layout Map on Sheet 1 in **Appendix C**.

Table 2: HEC-HMS Study Node Peak Flow Rates

HEC-HMS Study Node	HEC-RAS Boundary Condition	100-Year Storm Max Outflow (cfs)	500-Year Storm Max Outflow (cfs)
Sub-1-EX	BC-09	198.56	328.04
Sub-2-EX	BC-13	122.99	216.57
Sub-3-EX	BC-12	457.13	718.54
Sub-4-EX	BC-10	245.98	384.5
Sub-5-EX	BC-11	391.62	612.25
Sub-6-EX	BC-14	11.7	20.43
Sub-7-EX	BC-03	10.94	30.72
Sub-8-EX	BC-08	66.72	111
Sub-9-EX	BC-07	196.43	303.04
Sub-10-EX	BC-04	111.64	179.69

3.5 COMPARISON TO FIS FLOW DATA

Moosa Canyon Creek was previously studied by FEMA within the March 22, 2022 revision of the Flood Insurance Study (FIS). The FIS provides peak discharge rates at four different locations along Moosa Canyon Creek, though none of the four possess a contributing drainage area identical to the 1.59 square miles used within this report's HEC-HMS model. The most similar location, "Moosa Canyon Creek at Unnamed Road", has a drainage area of 1920 acres and a peak discharge of 3,120 CFS under 100-year storm conditions, roughly 1.63 cfs per acre. Conversely, this report's HEC-HMS model has a total drainage area of 1020 acres and a peak discharge of 1585 cfs during the 100-year storm, roughly 1.55 CFS per acre. The significance of this comparison indicates that flow rates derived for this study are generally consistent with that of FEMA and suitably conservative for use in establish flood risk and floodplain delineation. FIS flow data referenced above can be seen in **Appendix A**.

3.6 MAP DISCUSSION

Maps included in **Appendix A** are described below and show the spatial extent of the model and their inputs. Detailed results from the hydrologic model can be found in **Appendix B**.

Hydrologic Work Map

The Hydrologic Work Map presents the subbasins, routing reaches, and study nodes implemented within the HEC-HMS model. Runoff generally travels from east to west across the study area and converges on the westerly edge of the study area, just north of Woods Valley Road. Further detail on project hydrology can be found within **Appendix B.**

Watershed Land Use Map

The Watershed Land Use Map indicates the variety of land uses across the study area as defined by the National Land Cover Database (NLCD). The majority of land within the area can be categorized as cultivated agriculture, with smaller regions of medium and high density developed land interspersed across the study area. Land use and ground cover characterization within the NLCD was cross checked against current aerial imagery and found to be well representative.

Watershed Impervious Land Cover Map

The Watershed Impervious Land Cover Map presents impervious cover share across the study area. Most land area studied has relatively low impervious cover share (< 2%).

Watershed Soil Type Map (NRCS Survey)

The Watershed Soil Type Map shows the NRCS soil types across the study area. The study area is predominantly composed of USDA HSG Group D soils with a smaller concentration of USDA HSG Group A soils.

3.7 HEC-HMS MODEL FILES

Digital HEC-HMS Model files are included as part of this report. **Table 3** summarizes the file organization of the HEC-HMS Model.

Table 3: HEC-HMS Model Files

Plan Name	Digital File Names	
	Project File	Terrain Data
Existing Condition (100-Year)	San Pasqual_TO2.hms	USGS Unclipped.tif
Existing Condition (500-Year)		

4 FLOODPLAIN AND FLOODWAY ENCROACHMENT ANALYSIS

4.1 INTRODUCTION

To more accurately assess shallow unconfined flooding areas, merged flood sources, and other similar effects, an unsteady two-dimensional model was developed using a HEC-RAS 2D (v.6.3.1) model within the GeoHECRAS 2D data wrapper. This software is a 2D hydrodynamic routing model that performs hydraulic routing using the Implicit Finite Volume solution to the 2D unsteady flow Saint-Venant equations.

This type of model is generally used to estimate flooding limits and velocity distributions for both confined and unconfined flow. The hydraulic analysis incorporates 100-year and 500-year flow rates from the HEC-HMS analysis. GeoHECRAS 2D was selected for its universal computational acceptability by FEMA and for consistency with geospatial data files used in the analysis.

The HEC-RAS 2D User's Manual, published by the US Army Corps of Engineers, states that 2D hydraulic models are better suited for studying shallow unconfined flooding compared to 1D models, such as the 1D model used by FEMA to generate the FIRM. By calculating velocity, depth, and water surface elevation in multiple directions, 2D models can more accurately represent flooding extents.

4.2 HEC-RAS METHODOLOGY

This section details the rationale and methodology used when determining each input parameter used in the 2D hydraulic models. Model results are discussed in **Sections 4.3** and **4.4**. Hydraulic modelling methodology follows FEMA's Two-Dimensional Guidance for Flood Risk Analysis and Mapping (2020) utilizing the 0.2-percent-annual-chance floodplain boundaries.

4.2.1 FEDERAL FLOOD RISK MANAGEMENT STANDARD

The FFRMS was established for Federal Agencies to manage current and future flood risks. The FFRMS requires agencies to select one of three approaches for establishing the flood elevation and corresponding flood hazard area. For this analysis, the 500-year floodplain, or the area subject to flooding by the 0.2%-annual-chance flood was utilized. The 0.2-annual-chance floodplain method satisfies the FFRMS from Executive Order 11988.

4.2.2 MODEL SCENARIOS

As required by the scope of work dated August 25, 2023, four scenarios were considered in the HEC-RAS model, all based upon the existing condition:

- Existing Condition (100-Year Storm)
- Existing Condition (500-Year Storm – 0.2% annual chance)
- Existing Condition with Floodway Encroachments (100-Year Storm)
- Existing Condition with Floodway Encroachments (500-Year Storm – 0.2% annual chance)

Modelling scenarios were each run over a 24-hour simulation window using a computational time step of one second.

4.2.3 TERRAIN DEVELOPMENT

The terrain associated with the existing condition in the model was created by merging the CAD topography file provided by The Band with SanGIS topography. Though the CAD topography covers most of the study area, it was necessary to supplement with SanGIS data to fully encompass the spatial extents of the study area. The CAD data was given precedence between the two elevation files at boundary locations and engineering best judgement was used to manage consequences from elevation differences on the surrounding topography.

The merged terrain is a newer and more accurate representation of current topography compared to that used to generate FEMA's SFHA mapping of the project site.

To model the existing condition with floodway encroachments, a copy of the merged terrain was modified to include encroachment areas. Encroachment areas are used to assess flow displacement effects and additional head loss created from the use of fill within future development areas. Encroachment areas were iteratively refined such that surcharge effects were limited to a maximum of 1' at all locations.

4.2.4 COMPUTATIONAL 2D MESH

The 2D computational mesh uses cell spacing of 50 feet based on professional judgement. Where appropriate, break lines are established within channel flowlines, on roadways, etc. and provide higher resolution results by using cell spacing of 5 feet. Adaptation of the mesh size at break line locations allows the model to produce higher resolution results and maintaining acceptable continuity and run time. Break line locations can be seen within the 2D Hydraulic Model Layout Map on Sheet 1 in **Appendix C**.

4.2.5 2D CELL ROUGHNESS

Land use was determined using a combination of data obtained from the National Land Cover Dataset (NLCD, 2021), GIS processing, and aerial photography. Each land-use type was associated with a Manning's "n" roughness coefficient per guidance from the Army Corps of Engineers. The Manning's "n" roughness coefficients were applied to the grid to account for energy losses to water flow due to friction.

4.2.6 BOUNDARY CONDITIONS

As mentioned previously, flow hydrograph output files were used as the inflow boundary conditions in the HEC-RAS hydraulic model. Since direct application of FEMA Base Flood Elevation is infeasible, the downstream boundary control is based upon the assumption of normal depth under uniform flow conditions. Refer to Section 2.4. Locations at which boundary conditions were enforced can be seen within the 2D Hydraulic Model Layout ap on Sheet 1 in **Appendix C**.

4.2.7 FLOW OBSTRUCTIONS AND MODEL STRUCTURES

Flow obstructions caused by buildings, houses, etc. have been added to the 2D model by importing GIS building outlines from OpenStreetMap and verifying them against aerial photos and the survey data. One structure (Canal Road Culvert) has been added to the model, geometry measured during the field visit, and can be seen in the 2D Model Layout Map on Sheet 1 in **Appendix C**.

4.3 HYDRAULIC RESULTS

Hydraulic work maps for the existing condition and existing condition with floodway encroachments can be found on Sheets 2 and 3, respectively, in **Appendix C**. The hydraulic work maps present revised SFHA zones within the study area and were created using flood depth maps generated by the 2D hydraulic model discussed above. Since the scope of work required that the 500-year storm be modelled, SFHA Zone X (shaded) was mapped in addition to Zones AE, AO, and the regulatory floodway. Zone X (shaded) represents an area that will experience flooding during the 500-year storm (0.2% annual chance flood).

In addition to hydraulic work maps, base flood elevation (BFE) contour maps (Sheets 5 and 6 in **Appendix C**) were created for both the existing and existing condition with floodway encroachments scenarios. The BFE contour maps show the range of water surface elevations expected under 100-year storm conditions across the study area. Additionally, inundation maps were generated for each of the four scenarios considered and are included on Sheets 7-10 in **Appendix C**. The inundation maps show the range of flood depths expected across the study area.

4.4 MAP DISCUSSION

The maps included in **Appendix C** show the results from the various modelling scenarios described in **Section 4.2.1** as well as show the spatial extent of the models and their inputs.

1. 2D Hydraulic Model Layout

The 2D Hydraulic Model Layout map presents HEC-RAS modelling elements including breaklines, boundary conditions, road crossings, culverts, and encroachments in a geospatial fashion. The map also includes the 2D model study area boundaries, trust land boundaries, fee land boundaries, and the proposed WWTP site.

2. Existing Condition Hydraulic Work Map

The Existing Condition Hydraulic Work Map includes SFHA's and regulatory floodway delineated by Kimley-Horn using existing condition model outputs. The regulatory floodway shown was defined based on the natural condition flood extents and encroachment shapes included in the model. SFHA's and regulatory floodway boundaries delineated by FEMA have been mapped for reference using dashed lines.

East of Canal Road, flooding is generally limited to two channelized areas which converge just east of the Canal Road culvert. West of Canal Road, flooding extents expand considerably to both the north and south. Moving further west across the study area, flooding generally converges just north of Woods Valley Road. 500-year condition flood extents (Zone X (shaded)) generally extend just beyond the 100-year flood extents (Zones AE and AO).

3. Existing Condition with Encroachments Hydraulic Work Map

Similar to the previous map, the Existing Condition with Encroachments Hydraulic Work Map includes both Kimley-Horn and FEMA SFHA's and regulatory floodway for the encroached condition. The regulatory floodway delineated by Kimley-Horn was defined based on the encroached condition flood extents and encroachment shapes included in the model.

Flooding boundaries generally resemble those seen in the previous map with minor differences due to the water displaced by the encroachment shapes.

4. FEMA FIRM Panel Map

The FEMA FIRM Panel Map displays effective SFHA's and regulatory floodway delineated by FEMA using the same visual styling as other maps provided in **Appendix C**. Information provided matches what is shown on FIRM Panels 06073C0828G and 06073C0829G.

5. Existing Condition Base Flood Elevation Contour Map

The Existing Condition Base Flood Elevation Contour Map shows water surface elevation contours across the entire study area under the existing condition resulting from the 100-year storm condition. BFE contours near the proposed WWTP site are shown to range from 1642' to 1662'.

6. Existing Condition with Encroachments Base Flood Elevation Contour Map

Similarly, the Existing Condition with Encroachments Base Flood Elevation Contour Map displays 100-year storm water surface elevation contours across the study area under the encroached condition. In this scenario, BFE contours near the WWTP site are shown to range from 1642' to 1684'.

7. 100-Year Existing Condition Inundation Map

The 100-Year Existing Condition Inundation Map shows the max flood depth across the study area for the 100-year storm under natural conditions. Flood depth is shown to be greatest within the channelized areas east of Canal Road, the channelized area south of Kevaak Way, and a low point just south of Armstrong Ranch Road.

Areas of very shallow flooding can be seen to the north of Woods Valley Road. Such areas were either delineated as a Zone AO SFHA or modeled as an encroachment area within the encroachment scenario.

8. 100-Year Existing Condition with Encroachments Inundation Map

Map 5 presents max flood depth across the study area for the 100-year storm under encroached conditions. General flood behavior emulates that shown within Map 4 with slight differences due to the inclusion of water volumes displaced by encroachments. Comparing Maps 4 and 5, modeled encroachments are shown to generally increase flood depths within non-encroached areas.

9. 500-Year Existing Condition Inundation Map

The 500-Year Existing Condition Inundation Map presents results similar to those seen in Map 4 though the extents and depth of flooding are slightly larger than that shown in the 100-year case. The 500-year floodplain extents (Zone X (shaded)) are typically used to plan the development of structures deemed "critical" facilities such as police, fire, and hospitals.

10. 500-Year Existing Condition with Encroachments Inundation Map

The 500-Year Existing Condition with Encroachments Inundation Map presents results similar to those seen in Map 5 though the extents and depth of flooding are slightly larger than that shown in the 100-year case.

4.5 HEC-RAS MODEL FILES

Digital HEC-RAS Model files are included as part of this report. **Table 4** summarizes the file organization of the HEC-RAS Models.

Table 4: HEC-RAS Model Files

Plan Name	Digital File Names		
	Project File	Terrain Data	Unsteady Flow Data
Scenario_1 (100-Year Storm, Existing Condition)	San Pasqual TO2 100 Year.prj	Merged_DEM 14Dec.tif	San Pasqual TO2 100 Year.u01
Scenario_2 (100-Year Storm, Existing Condition with Floodway Encroachments)		Encroached_Terrain_Jan82024.tif	
Scenario_1 (500-Year Storm, Existing Condition)	San Pasqual TO2 500 Year.prj	Merged_DEM 14Dec.tif	San Pasqual TO2 500 Year.u01
Scenario_2 (500-Year Storm, Existing Condition with Floodway Encroachments)		Encroached_Terrain_Jan82024.tif	

5 APPLICABILITY TO THE 8-STEP PROCESS

The San Pasqual Band of Mission Indians is seeking Federal funding assistance for developing infrastructure on the Reservation, and as result the proposed projects must adhere to federal policy directives. To comply with these policy directives, IHS implements a systematic decision-making process referred to as the 8-Step Process. The 8-Step Process combines floodplain and environmental considerations to assess the impacts of proposed development, notify and involve the public, assess alternatives if the proposed development has the potential to negatively impact the community and environment, and provides guidance on implementing this action.

This report discusses floodplains as they pertain to Step #1 of the 8-Step Process. The first step in the 8-step process is to identify floodplains in project area using one of the three approved methods. This report utilized the 0.2-Percent-Annual-Chance Flood Approach, which is in accordance with the FFRMS. A comprehensive review of the 8-step process, including its broader context, public notification, and analysis of Step #2 through Step #8, which involve notifying the public and identifying alternatives, is covered by a separate Impact and Alternatives Analysis Summary Report.

As SPBMI considers future development projects this report can serve as a high-level planning tool, but each proposed development project will need to re-evaluate the design as it relates to floodplains and if warranted, determine the most feasible methods to remove proposed actions from the floodplain. **Section 6** of this report describes some possible methods for locating facilities outside of the floodplain. As shown in Sheet 2 (Existing Condition Hydraulic Work Map) in **Appendix C**, the proposed Wastewater Treatment Plant site is currently subject to highly localized minor flooding during the 100-year storm event under the existing condition. Flood depth within the boundaries of the WWTP plant range from 0.00-0.65 feet. Flooded areas within the WWTP boundary have been characterized as Zones AE and X (shaded) and Base Flood Elevations (BFE's) range from 1642' to 1684' surrounding the proposed site.

6 CONCLUSION

The results of the hydrologic and hydraulic models discussed are sufficient to meet the objectives defined for this report in **Section 2.1** and discussed below.

Objective 1: *Review and discuss the digital processing of existing data files available from FEMA and the San Pasqual Band of Mission Indians and their relevancy to this report's analysis and results.*

Conclusion: Elevations indicated in the site-specific topography were found to be higher than FEMA Base Flood Elevations, suggesting a fairly widespread discrepancy between the site-specific topography and the underlying topography in the FEMA analysis. Base Flood Elevations published by FEMA are not suitable to use as the downstream hydraulic tie-in for floodplain computations.

Objective 2: *Conduct a hydrologic analysis to develop peak flow rates for the stream reaches studied in the hydraulic model using the US Army Corps of Engineer's HEC-HMS software.*

Conclusion: Peak flow rates and supplementary information generated by this report's hydrologic analysis can be found in **Appendix B**.

Objective 3: *Perform hydraulic modeling in HEC-RAS to determine the spatial limits of Special Flood Hazard Areas.*

Conclusion: Hydraulic work maps shown on Sheets 2 and 3 in **Appendix C** display Special Flood Hazard Area extents generated by this report's 2D hydraulic analysis.

Objective 4: *Incorporate an encroachment analysis into the hydraulic model and use the results to delineate a regulatory floodway area.*

Conclusion: Sheet 3 in **Appendix C** (Existing Condition with Encroachments Hydraulic Work Map) presents the encroachments modeled and resulting regulatory floodway produced by this report.

Objective 5: *Discuss model results and their relevancy to the IHS 8-Step Process for Decision Making for Projects within Floodplains.*

Conclusion: The delineated floodway shown on Sheet 3 in **Appendix C** is intended to serve as a planning tool for the Band and, if followed diligently, can be used to aid the IHS-8 step process during future development. No development of any kind (i.e., placement of fill, buildings, structures, etc.) should occur within the floodway. Development within all other Special Flood Hazard Areas has been computationally accounted for through the floodway encroachment scenario within this analysis. Development within Special Flood Hazard Areas outside of the floodway (i.e., District A or elsewhere) is appropriate from the perspective of flood risk/flood impact provided that:

1) New structures are properly elevated (i.e., above Base Flood Elevations resulting from the "encroachment" modeling scenario), and
2) Project hydrology remains unchanged or is mitigated to pre-project conditions.

7 REFERENCES

[1] FEMA. (2019, November) *Guidance for Flood Risk Analysis and Mapping, Floodplain Boundary Standards (FBS)*.

[2] FEMA. (2022, March) *San Diego County, California Flood Insurance Study*. https://www.sandiegocounty.gov/content/dam/sdc/dpw/FLOOD_CONTROL/crs/FIS2022-06073CV002F.pdf

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[5] San Diego County. (n.d.). *SanGIS GIS Topography*. SanGIS Website. https://www.sangis.org/

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[10] Hurricane and Flood Mitigation Handbook For Public Facilities. Factsheet 4.2: Wastewater Treatment Systems. March 2022.

[11] FEMA Critical Facilities and Higher Standards Factsheet.

[12] FEMA 543: Design Guide For Improving Critical Facility Safety from Flooding and High Winds. http://www.fema.gov/media-library/assets/documents/8811?id=2441

[13] FEMA Recovery Advisory 2: Reducing Flood Effects in Critical Facilities. http://www.fema.gov/media-library-data/1381404651877-881a2cf70a90ac63b9c067100ffccace/SandyRA2CriticalFacilities_508_FINAL2.pdf

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8 APPENDICES

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8 APPENDICES

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APPENDIX A – HYDROLOGY MAPS

HYDROLOGIC WORK MAP

WATERSHED LAND USE MAP

WATERSHED IMPERVIOUS LAND COVER MAP

WATERSHED SOIL TYPE MAP (NRCS SOIL SURVEY)

FIS FLOW DATA TABLE

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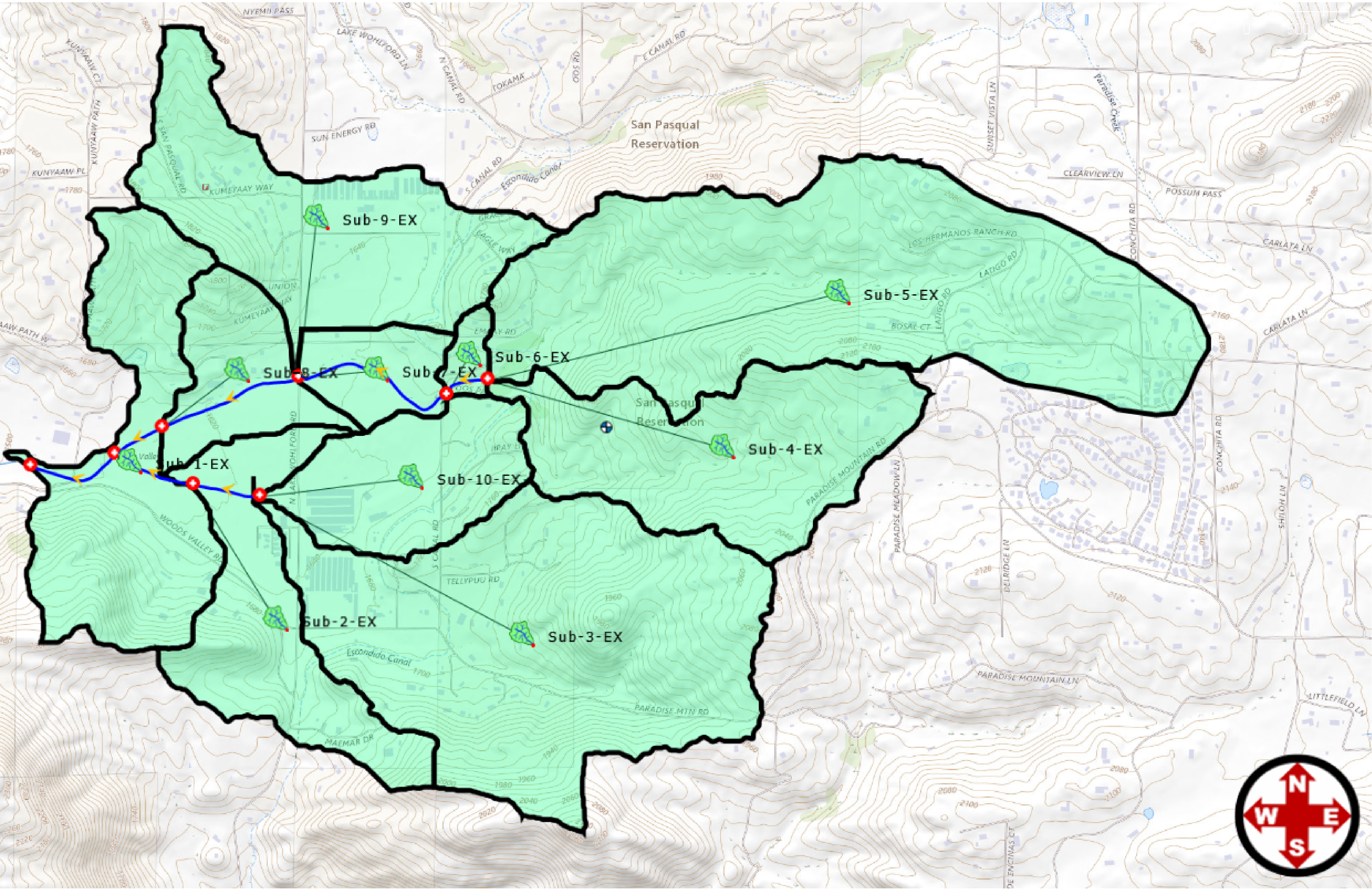
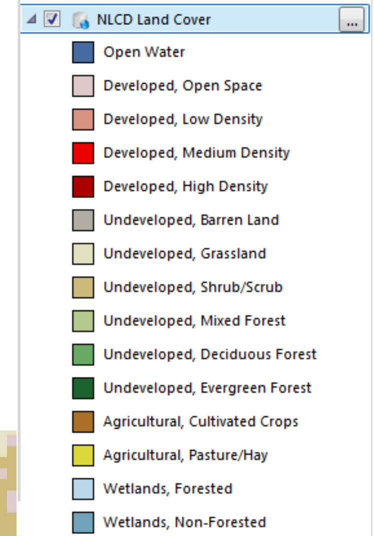
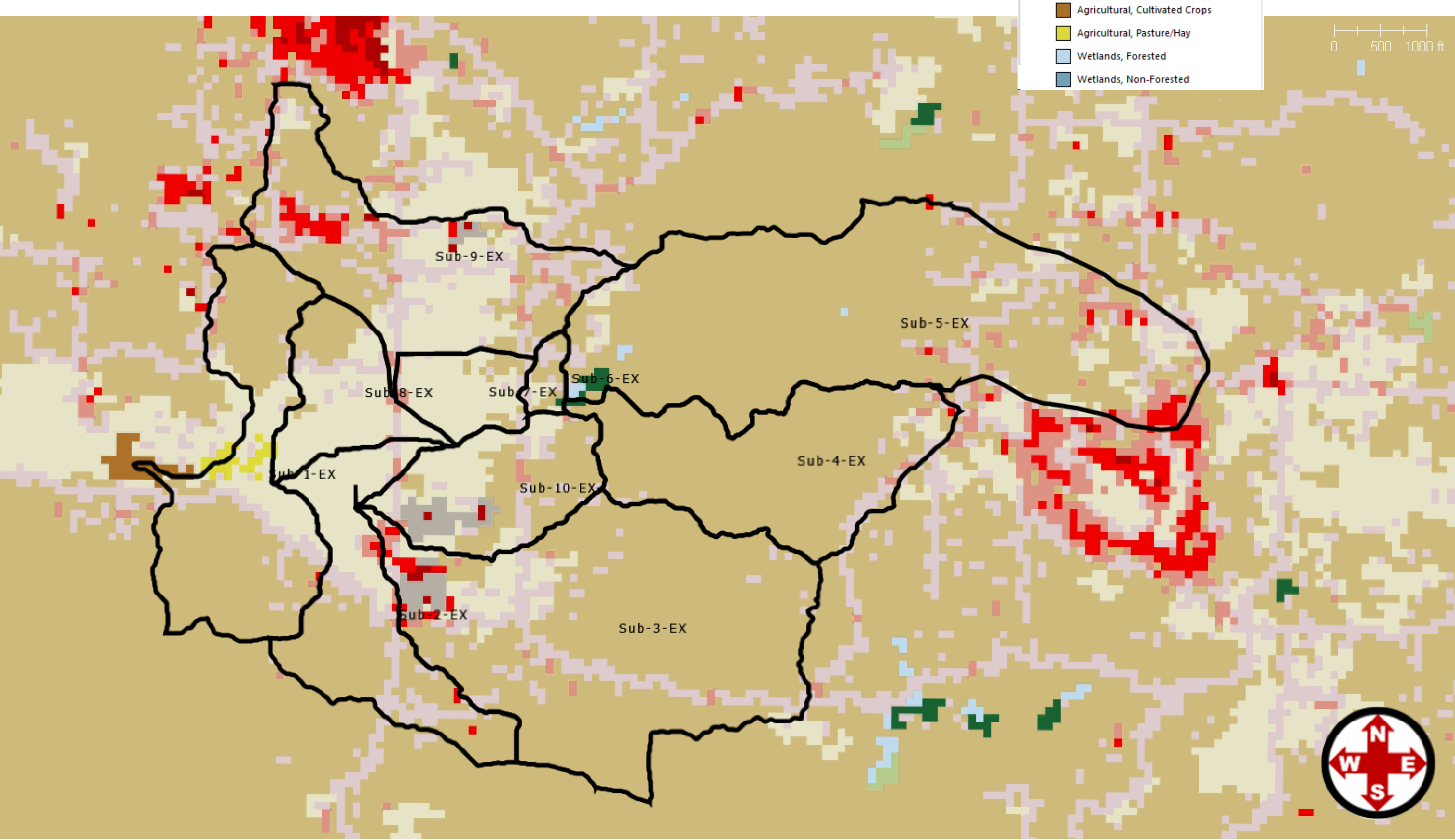
Appendix A.1 - Hydrologic Work Map

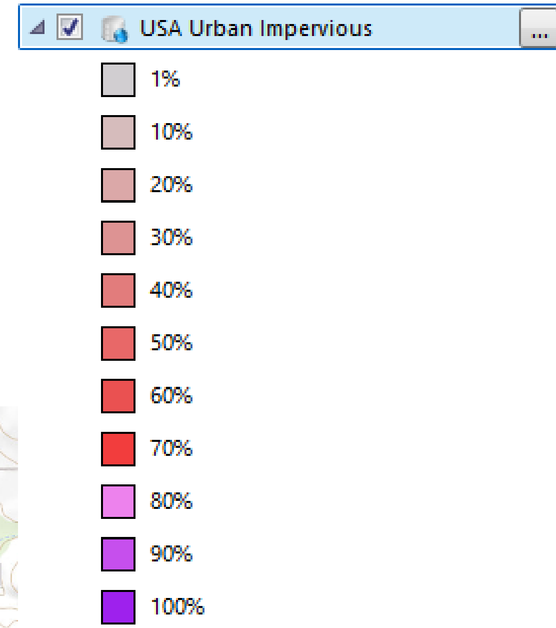


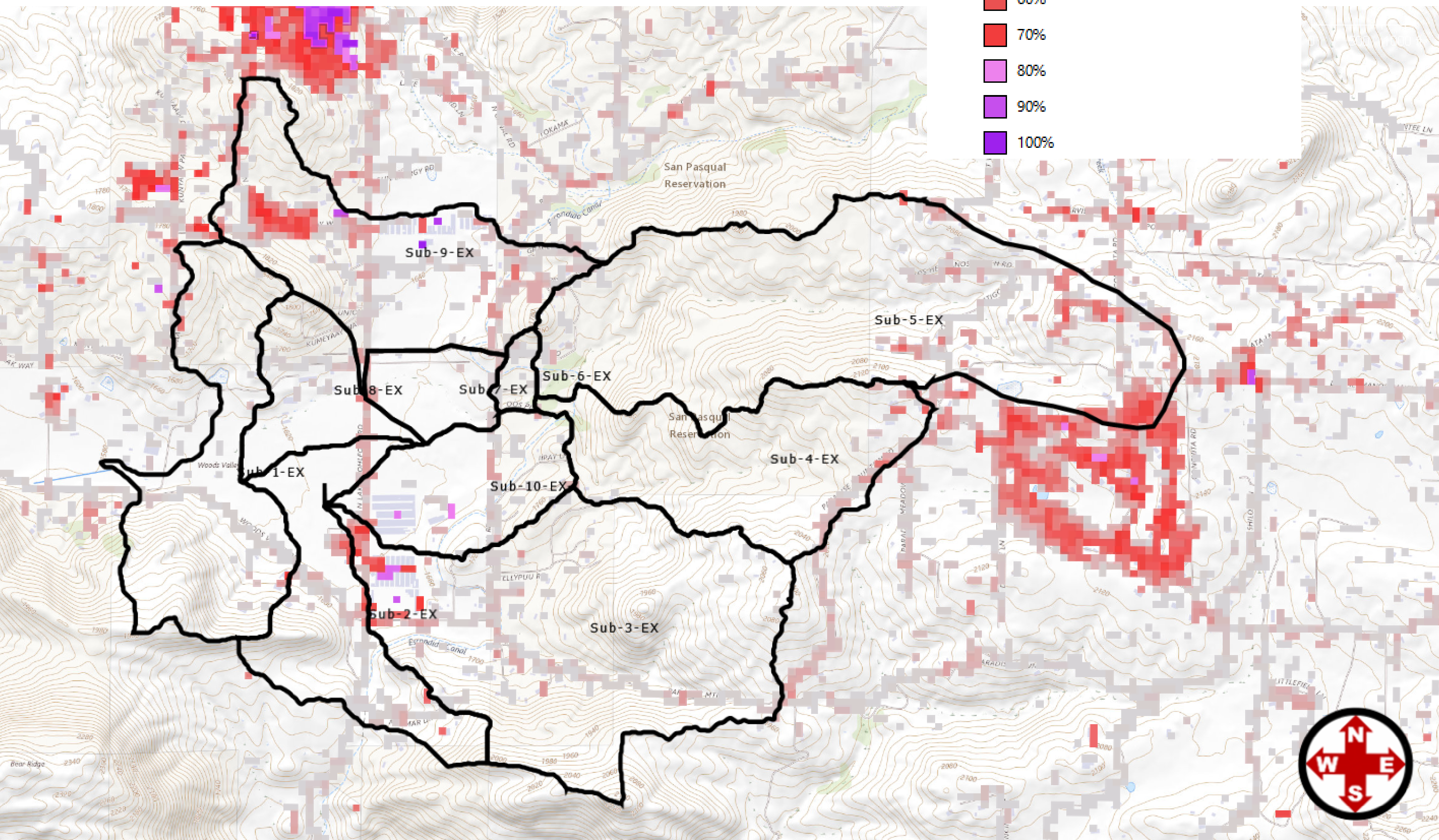
Appendix A.2 - Watershed Land Use Map





Appendix A.3 - Watershed Impervious Land Cover Map





Appendix A.4 - Watershed Soil Type (NRCS Soil Survey)

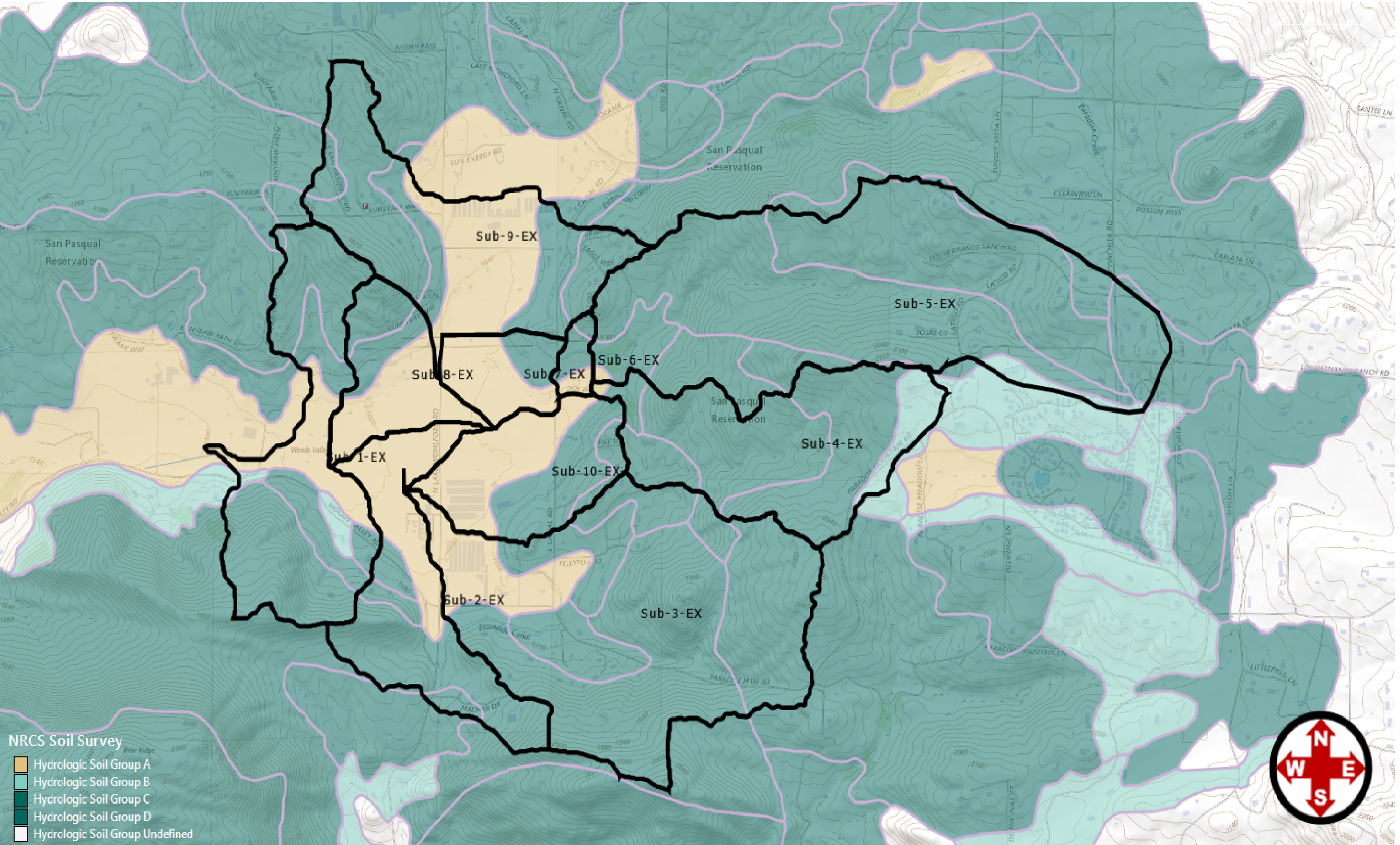


Table 9: Summary of Discharges, continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)				
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Mexican Canyon Creek	At U.S. Highway 94, 9,600 Feet Upstream of Confluence	2.0	160	*	700	1,060	1,470
Moosa Canyon Creek	Near Junction of Moosa Road and U.S. Highway 395	34.7	2,600[1]	*	9,000[1]	13,000[1]	29,000[1]
Moosa Canyon Creek	At U.S. Highway 395, Near River at Elevation 400 Feet	29.2	2,200[1]	*	7,500	11,550[1]	26,000[1]
Moosa Canyon Creek	Upstream of Confluence with South Fork Moosa Canyon Creek	21.4	1,400[1]	*	5,100[1]	7,800[1]	17,000[1]
Moosa Canyon Creek	At Old Castle Ranch	15.0	800[1]	*	3,300[1]	5,100[1]	11,000[1]
Moosa Canyon Creek	At Unnamed Road	3.0	*	*	*	3,120	*
Murphy Canyon Creek	Upstream of Friars Road	12.1	1,500	*	2,700	3,500	5,500
Murphy Canyon Creek	Downstream of Aero Drive	10.1	1,100	*	2,400	3,000	3,800[2]
Murphy Canyon Creek	Upstream at Aero Drive	10.1	1,100	*	2,400	3,000	5,000
Murphy Canyon Creek	Downstream of Confluence with Shepard Canyon	9.2	850	*	2,000	2,400	4,200

APPENDIX B – HEC-HMS RESULTS

SUPPLEMENTAL HYDROLOGY REPORT

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San Pasqual Task Order #2 Floodplain Analysis
Supplementary Hydrology Report

Prepared for:
John Flores
Environmental Director & Domestic Water Manager
San Pasqual Band of Mission Indians
16400 Kumeyaay Way
Valley Center, California 92082

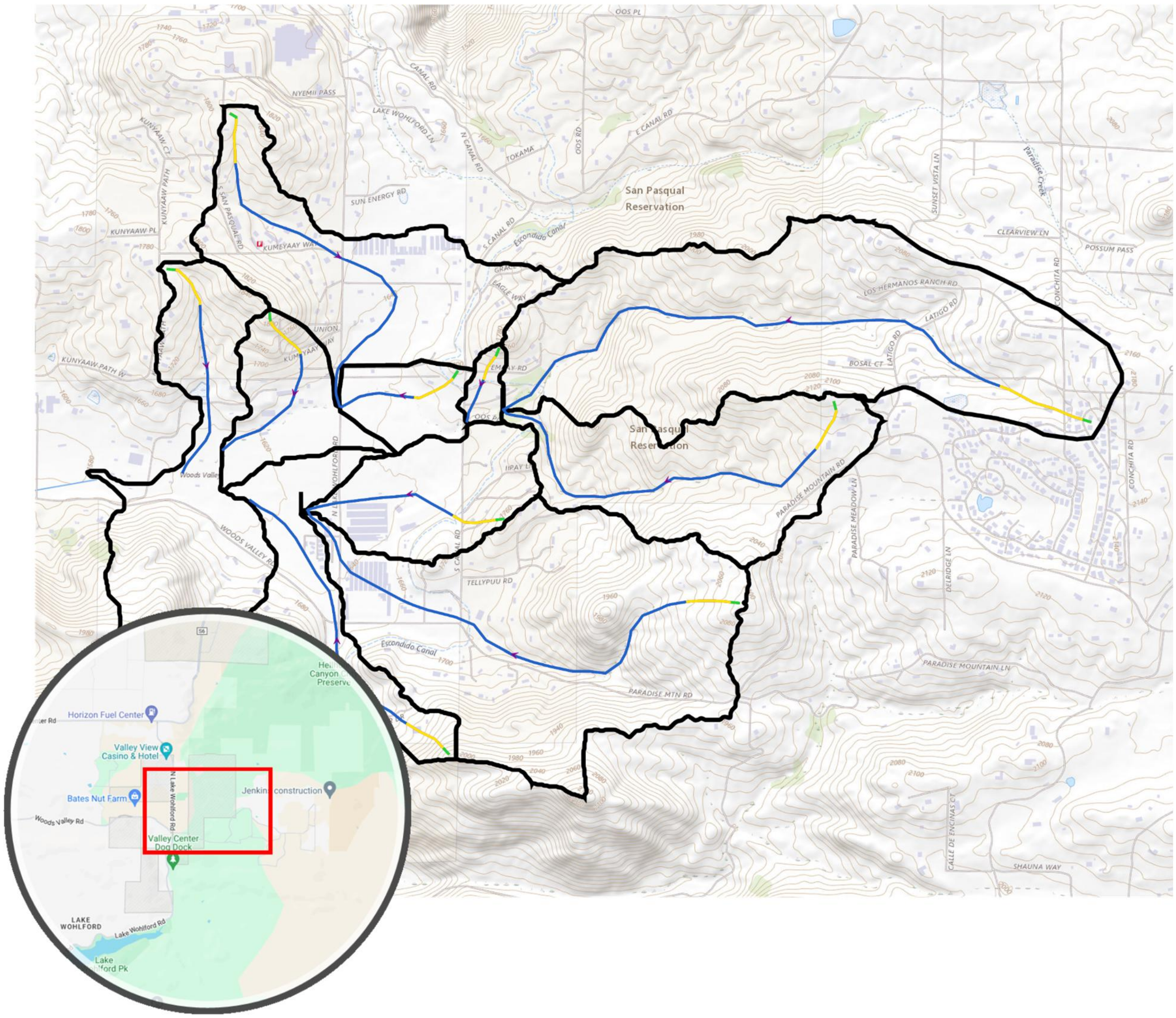
Prepared by:
Richard Lucera, PE
Kimley-Horn and Associates, Inc.
401 B Street, Suite 600
San Diego, CA 92101

December 29, 2023

Contents

Project Description

The project is located in Valley Center, Caalifornia. The site is 1,020.767 acres in size.



The following scenarios were analyzed in this hydrology study:

Ex Condition 100 Year

This scenario contains:

- 10 delineated subbasin areas and corresponding lag time flow paths.
- 7 routing reaches.
- 8 connecting junctions.

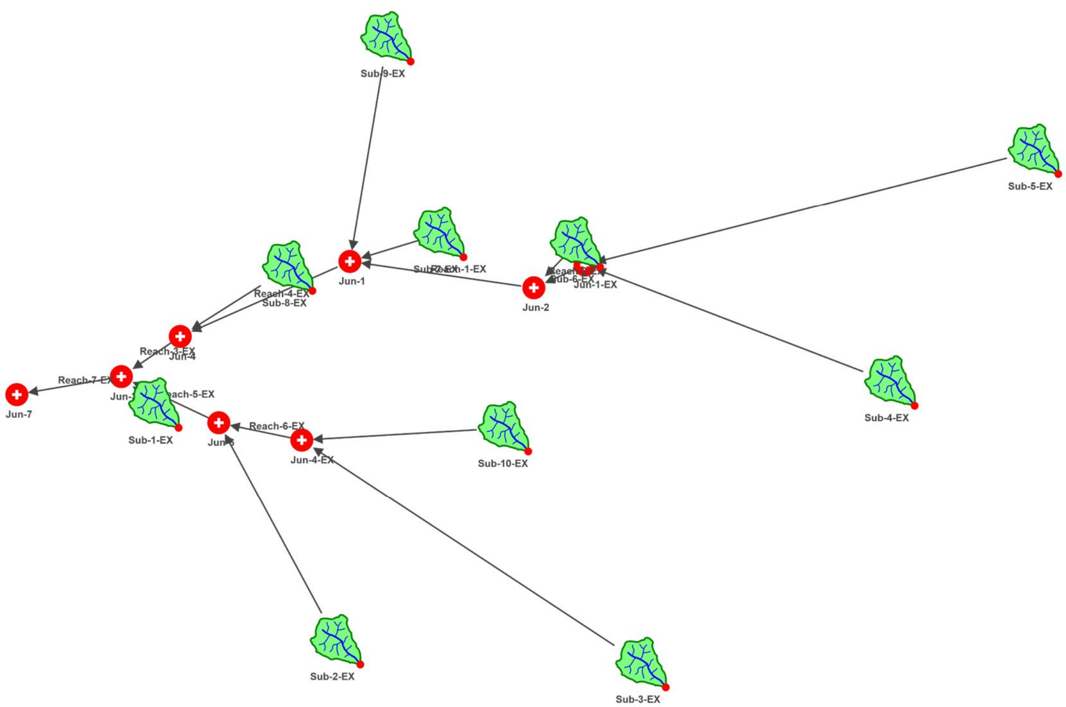
Ex Condition 500 Year

This scenario contains:

- 10 delineated subbasin areas and corresponding lag time flow paths.
- 7 routing reaches.
- 8 connecting junctions.

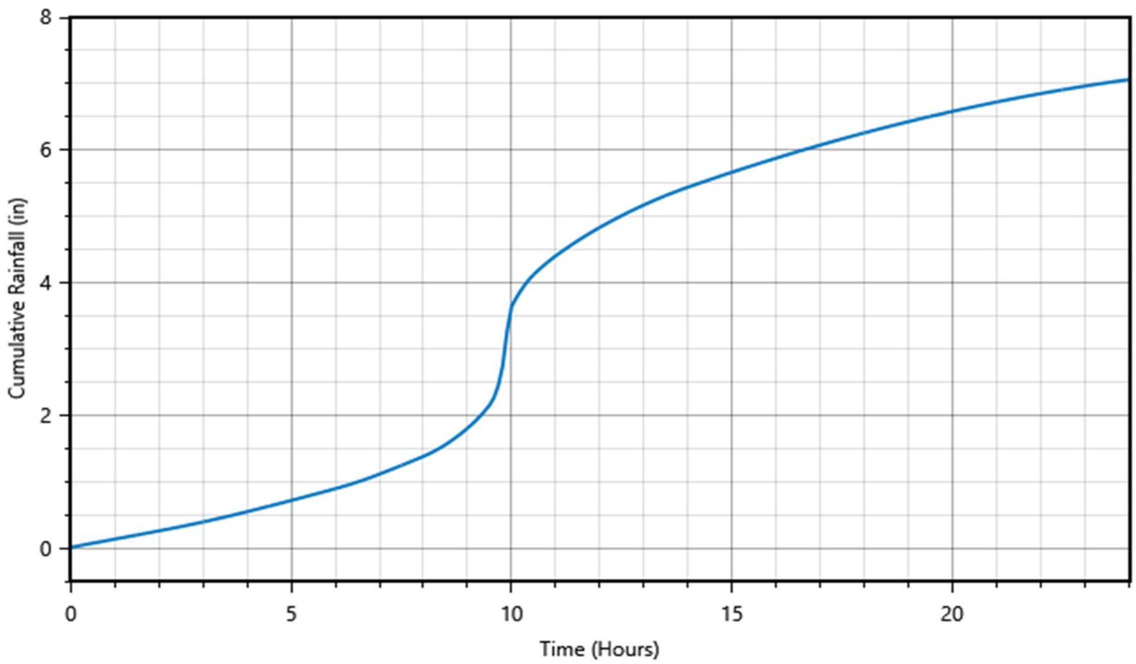
Ex Condition 100 Year

Watershed Routing Diagram



Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type I
Rainfall depth: 7.05 in



Watershed Summary

Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
Sub-1-EX	104.817	N/A	65.27	0.89	10.12	198.56
Sub-2-EX	78.204	N/A	58.95	3.51	8.59	122.99
Sub-3-EX	221.228	N/A	69.91	2.42	12.83	457.13
Sub-4-EX	109.433	N/A	70.73	1.76	11.12	245.98
Sub-5-EX	256.583	N/A	70.73	3.27	24.32	391.62
Sub-6-EX	7.259	N/A	60.44	1.82	9.02	11.70
Sub-7-EX	25.897	N/A	42.85	3.70	8.58	10.94
Sub-8-EX	42.109	N/A	49.10	25.00	8.65	66.72
Sub-9-EX	116.229	N/A	62.77	25.00	18.91	196.43
Sub-10-EX	59.007	N/A	54.51	25.00	8.74	111.64

Subbasins

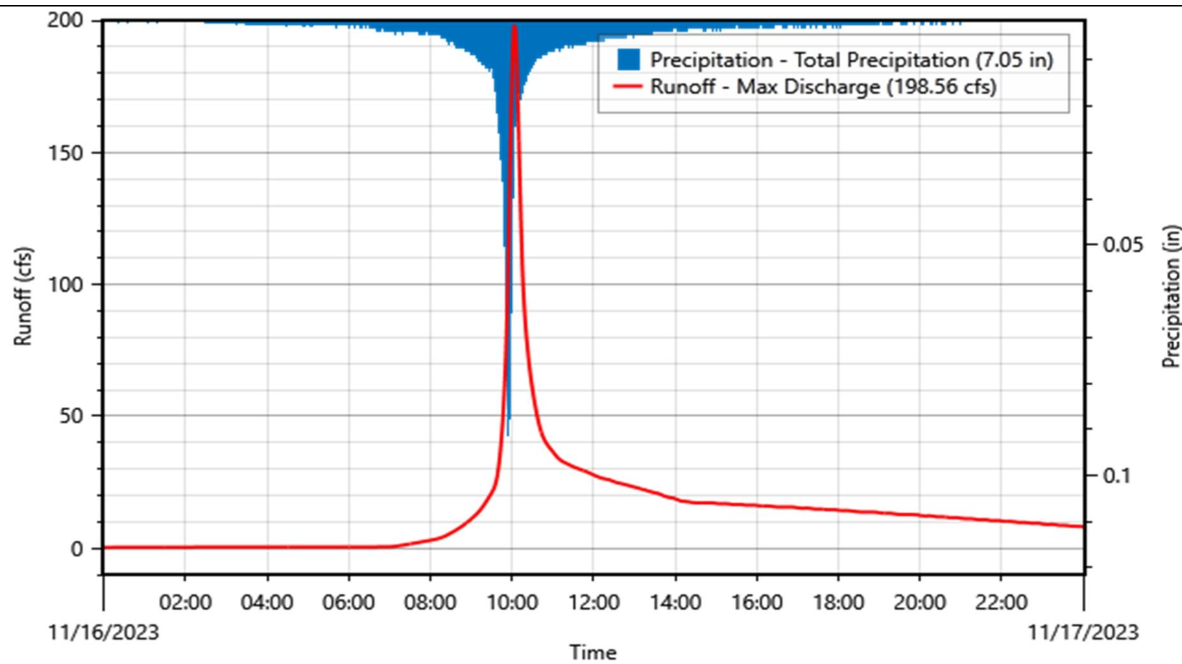
Subbasin ID:	Sub-1-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	198.56 cfs	Time of peak:	16 Nov 2023, 10:04	
Drainage area:	104.817 acres	Total rainfall:	7.05 in	61.58880 ac-ft
Initial abstraction:	N/A	Losses:	3.85 in	33.60368 ac-ft
Curve Number:	65.27	Precip excess:	3.20 in	27.98512 ac-ft
Impervious surface:	0.89%	Direct runoff:	3.19 in	27.84522 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	10.12 minutes	Total runoff:	3.19 in	27.84522 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.338	0.32	90.43
Undefined	Agricultural, Cultivated Crops	0.848	0.81	67.00
Undefined	Agricultural, Pasture/Hay	2.225	2.12	39.00
Undefined	Developed, Low Density	1.170	1.12	84.69
Undefined	Developed, Open Space	11.236	10.72	74.54
Undefined	Undeveloped, Grassland	16.859	16.08	40.98
Undefined	Undeveloped, Shrub/Scrub	72.142	68.83	69.85
Weighted Average		104.817	100.00	65.27

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
11.29	100.00	0.11848	1.2787	Sheet Flow
1.46	500.00	0.12471	11.6615	Shallow Concentrated Flow
4.12	1,973.86	0.05804	7.9557	Channel Flow
16.87	2,573.86	Total	Lag Time = 10.13 minutes	



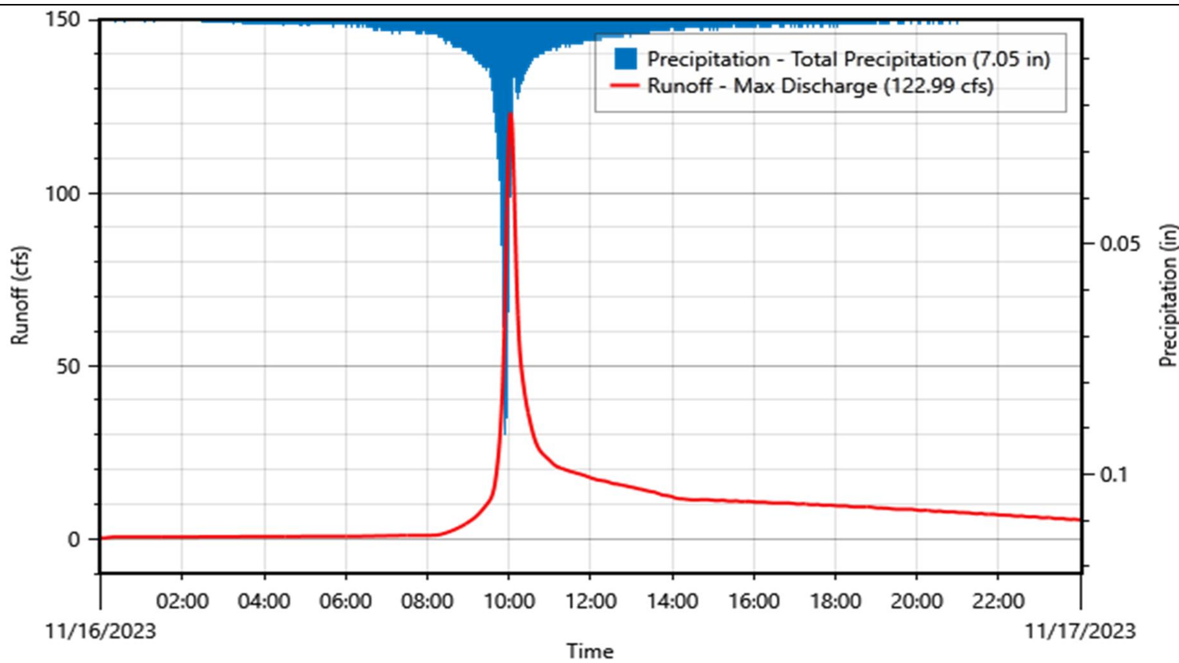
Subbasin ID:	Sub-2-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	122.99 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	78.204 acres	Total rainfall:	7.05 in	45.94720 ac-ft
Initial abstraction:	N/A	Losses:	4.36 in	28.38734 ac-ft
Curve Number:	58.95	Precip excess:	2.69 in	17.55986 ac-ft
Impervious surface:	3.51%	Direct runoff:	2.68 in	17.47991 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.59 minutes	Total runoff:	2.68 in	17.47991 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.964	1.23	84.47
Undefined	Developed, Low Density	1.848	2.36	62.18
Undefined	Developed, High Density	0.000	0.00	89.00
Undefined	Developed, Open Space	12.763	16.32	72.41
Undefined	Undeveloped, Barren Land	0.000	0.00	77.00
Undefined	Undeveloped, Grassland	23.749	30.37	31.29
Undefined	Undeveloped, Shrub/Scrub	38.880	49.72	70.65
Weighted Average		78.204	100.00	58.95

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
6.37	100.00	0.49617	2.6168	Sheet Flow
0.96	500.00	0.28890	17.7493	Shallow Concentrated Flow
6.99	3,279.23	0.05582	7.8019	Channel Flow
14.32	3,879.23	Total	Lag Time = 8.60 minutes	



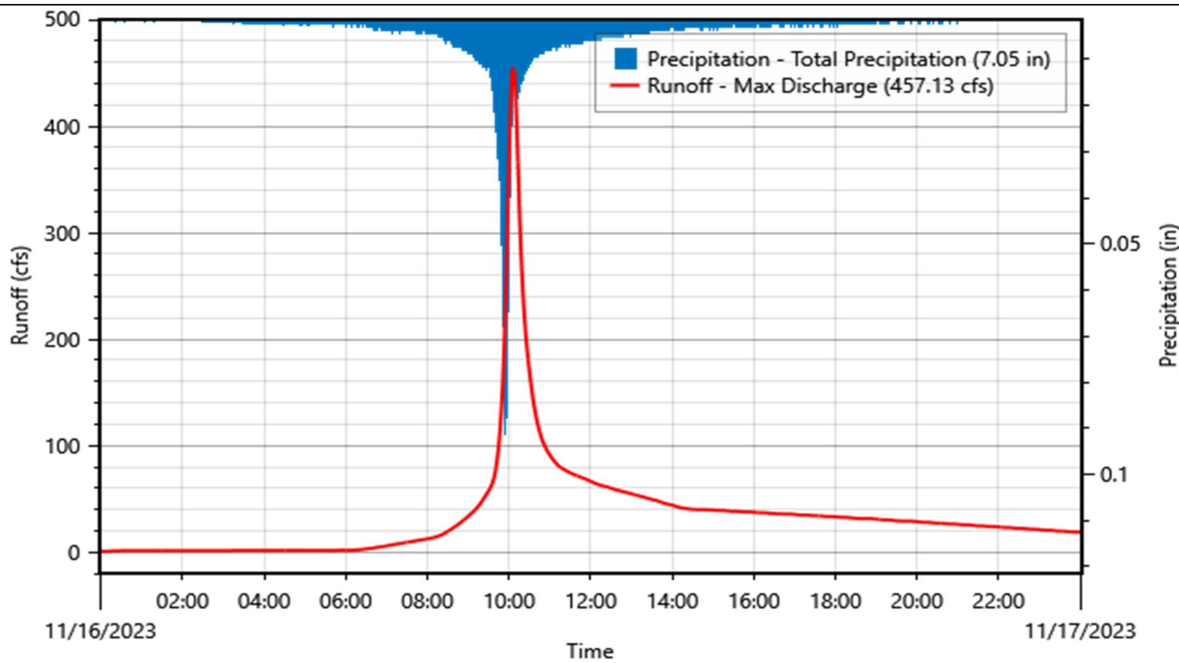
Subbasin ID:	Sub-3-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	457.13 cfs	Time of peak:	16 Nov 2023, 10:06	
Drainage area:	221.228 acres	Total rainfall:	7.05 in	129.98319 ac-ft
Initial abstraction:	N/A	Losses:	3.32 in	61.16057 ac-ft
Curve Number:	69.91	Precip excess:	3.73 in	68.82263 ac-ft
Impervious surface:	2.42%	Direct runoff:	3.71 in	68.41991 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	12.83 minutes	Total runoff:	3.71 in	68.41991 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	2.642	1.19	78.02
Undefined	Developed, Low Density	3.110	1.41	73.33
Undefined	Developed, High Density	0.774	0.35	89.00
Undefined	Developed, Open Space	25.613	11.58	73.70
Undefined	Undeveloped, Barren Land	4.692	2.12	77.00
Undefined	Undeveloped, Grassland	13.872	6.27	44.29
Undefined	Undeveloped, Shrub/Scrub	170.526	77.08	70.95
Weighted Average		221.228	100.00	69.91

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
10.25	100.00	0.15099	1.4435	Sheet Flow
1.25	500.00	0.16977	13.6062	Shallow Concentrated Flow
9.88	5,292.53	0.07267	8.9020	Channel Flow
21.38	5,892.53	Total	Lag Time = 12.83 minutes	



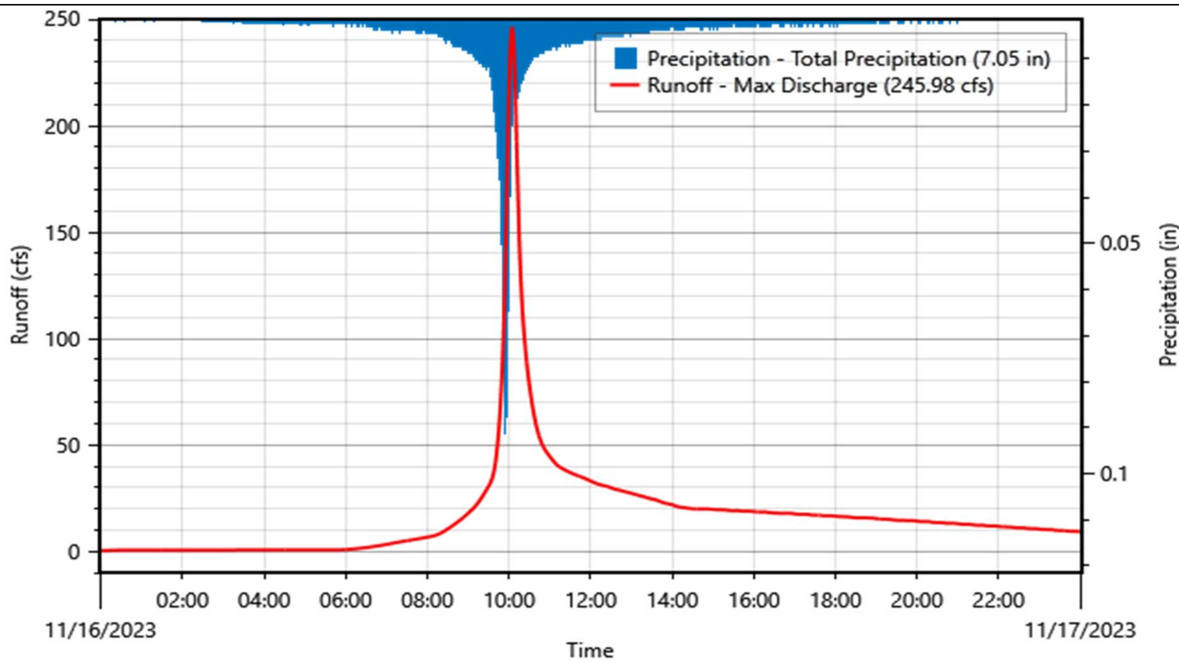
Subbasin ID:	Sub-4-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	245.98 cfs	Time of peak:	16 Nov 2023, 10:04	
Drainage area:	109.433 acres	Total rainfall:	7.05 in	64.29600 ac-ft
Initial abstraction:	N/A	Losses:	3.25 in	29.68282 ac-ft
Curve Number:	70.73	Precip excess:	3.80 in	34.61318 ac-ft
Impervious surface:	1.76%	Direct runoff:	3.78 in	34.43959 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	11.12 minutes	Total runoff:	3.78 in	34.43959 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.149	0.14	85.00
Undefined	Undeveloped, Evergreen Forest	0.434	0.40	37.15
Undefined	Developed, Low Density	1.157	1.06	74.97
Undefined	Developed, Open Space	6.174	5.64	75.28
Undefined	Undeveloped, Grassland	2.188	2.00	62.33
Undefined	Undeveloped, Shrub/Scrub	99.331	90.77	70.71
Weighted Average		109.433	100.00	70.73

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
9.61	100.00	0.17735	1.5645	Sheet Flow
1.83	500.00	0.07945	9.3077	Shallow Concentrated Flow
7.09	4,346.86	0.09511	10.1840	Channel Flow
18.53	4,946.86	Total	Lag Time = 11.12 minutes	



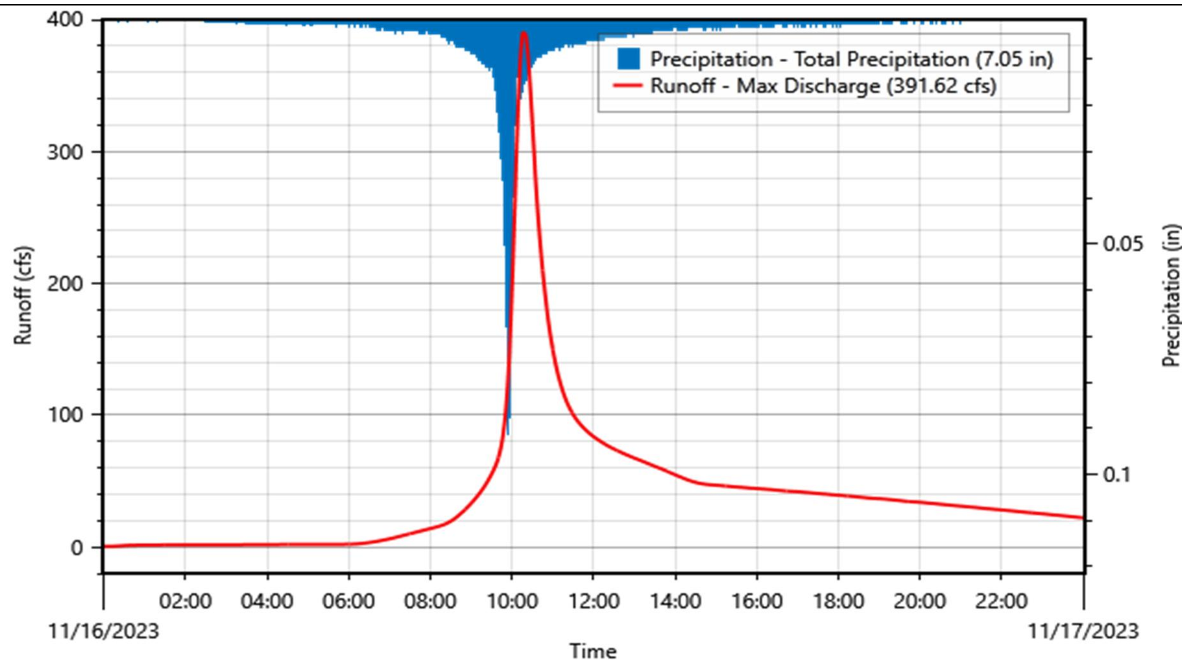
Subbasin ID:	Sub-5-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	391.62 cfs	Time of peak:	16 Nov 2023, 10:18	
Drainage area:	256.583 acres	Total rainfall:	7.05 in	150.73839 ac-ft
Initial abstraction:	N/A	Losses:	3.20 in	68.52010 ac-ft
Curve Number:	70.73	Precip excess:	3.85 in	82.21830 ac-ft
Impervious surface:	3.27%	Direct runoff:	3.80 in	81.30408 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	24.32 minutes	Total runoff:	3.80 in	81.30408 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Wetlands, Forested	1.146	0.45	100.00
Undefined	Developed, Medium Density	3.229	1.26	89.55
Undefined	Undeveloped, Evergreen Forest	1.530	0.60	65.18
Undefined	Developed, Low Density	9.854	3.84	83.32
Undefined	Developed, Open Space	24.543	9.57	81.02
Undefined	Undeveloped, Grassland	13.325	5.19	72.66
Undefined	Undeveloped, Shrub/Scrub	202.958	79.10	68.33
Weighted Average		256.583	100.00	70.73

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
19.55	100.00	0.00001	0.0117	Sheet Flow
5.97	1,000.00	0.00001	0.1044	Shallow Concentrated Flow
15.01	6,306.87	0.04475	6.9858	Channel Flow
40.53	7,406.87	Total	Lag Time = 24.32 minutes	



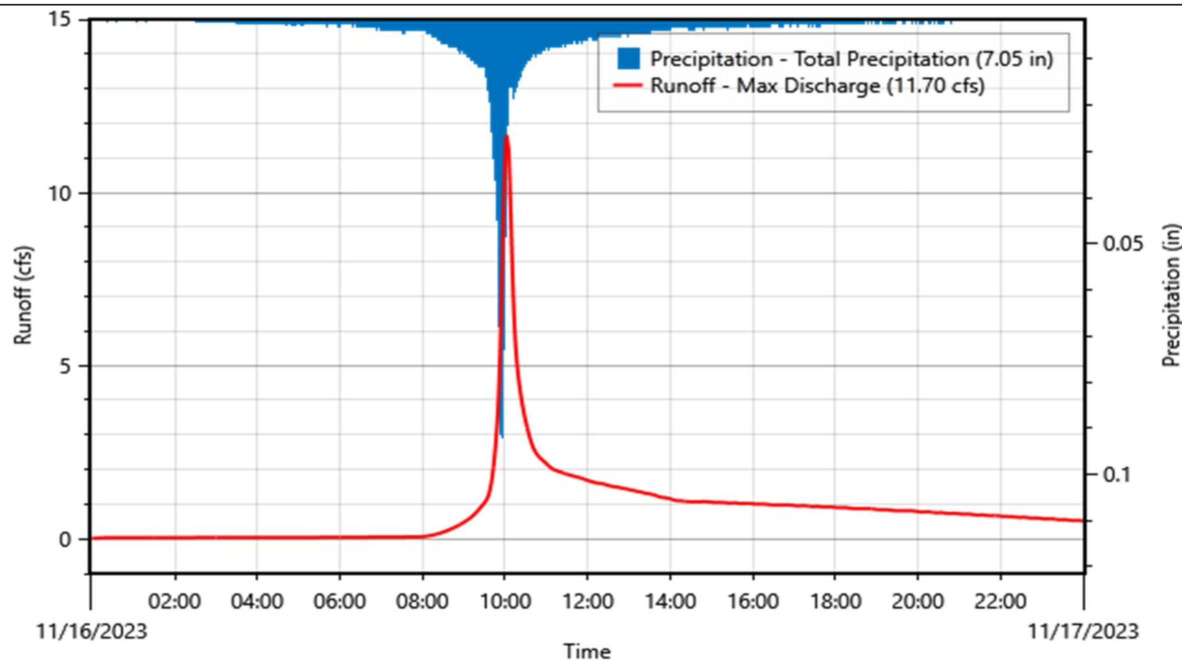
Subbasin ID:	Sub-6-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	11.70 cfs	Time of peak:	16 Nov 2023, 10:03	
Drainage area:	7.259 acres	Total rainfall:	7.05 in	4.24880 ac-ft
Initial abstraction:	N/A	Losses:	4.29 in	2.58422 ac-ft
Curve Number:	60.44	Precip excess:	2.76 in	1.66458 ac-ft
Impervious surface:	1.82%	Direct runoff:	2.75 in	1.65664 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	9.02 minutes	Total runoff:	2.75 in	1.65664 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Wetlands, Forested	0.060	0.83	100.00
Undefined	Undeveloped, Evergreen Forest	0.297	4.09	30.00
Undefined	Developed, Open Space	2.424	33.40	73.28
Undefined	Undeveloped, Grassland	1.568	21.60	50.55
Undefined	Undeveloped, Shrub/Scrub	2.909	40.08	57.35
Weighted Average		7.259	100.00	60.44

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
6.42	100.00	0.48484	2.5868	Sheet Flow
0.85	300.00	0.13295	12.0407	Shallow Concentrated Flow
1.24	511.49	0.04337	6.8770	Channel Flow
8.51	911.49	Total	Lag Time = 5.11 minutes	



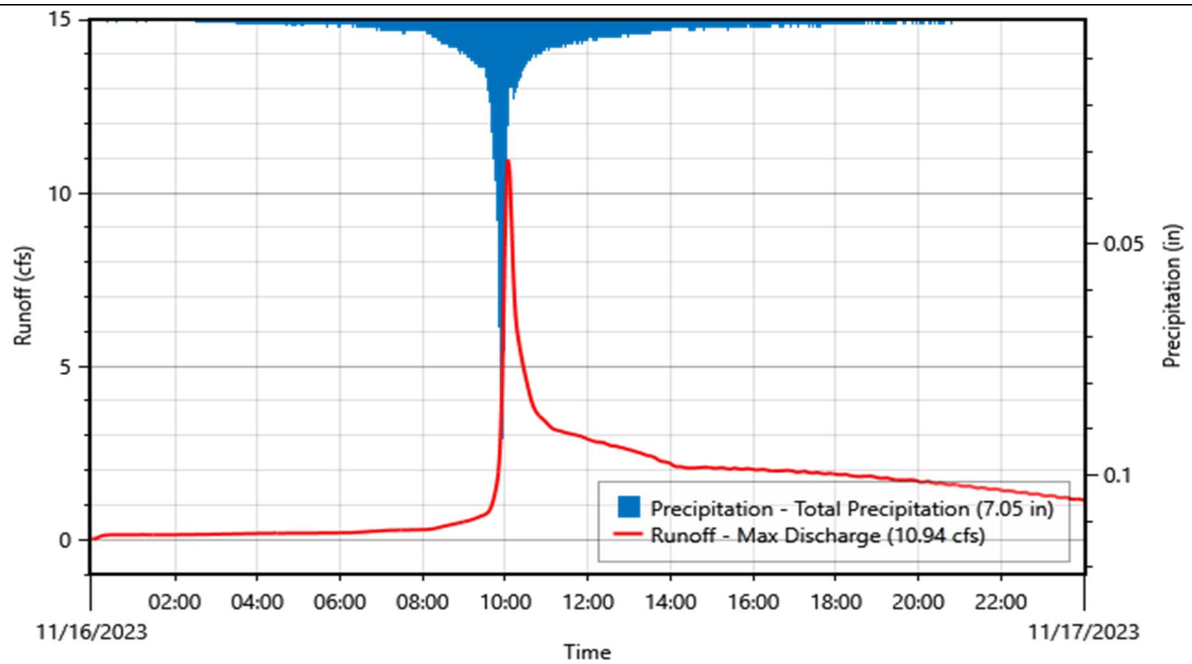
Subbasin ID:	Sub-7-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	10.94 cfs	Time of peak:	16 Nov 2023, 10:04	
Drainage area:	25.897 acres	Total rainfall:	7.05 in	15.22800 ac-ft
Initial abstraction:	N/A	Losses:	5.75 in	12.40993 ac-ft
Curve Number:	42.85	Precip excess:	1.30 in	2.81807 ac-ft
Impervious surface:	3.70%	Direct runoff:	1.30 in	2.80108 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.58 minutes	Total runoff:	1.30 in	2.80108 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Undeveloped, Shrub/Scrub	3.397	13.12	53.02
Undefined	Developed, Low Density	0.710	2.74	61.00
Undefined	Developed, Open Space	2.166	8.36	64.81
Undefined	Undeveloped, Grassland	19.623	75.78	38.01
Weighted Average		25.897	100.00	42.85

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
8.87	100.00	0.21656	1.7288	Sheet Flow
1.74	500.00	0.08837	9.8165	Shallow Concentrated Flow
3.69	857.85	0.01372	3.8680	Channel Flow
14.30	1,457.85	Total	Lag Time = 8.58 minutes	



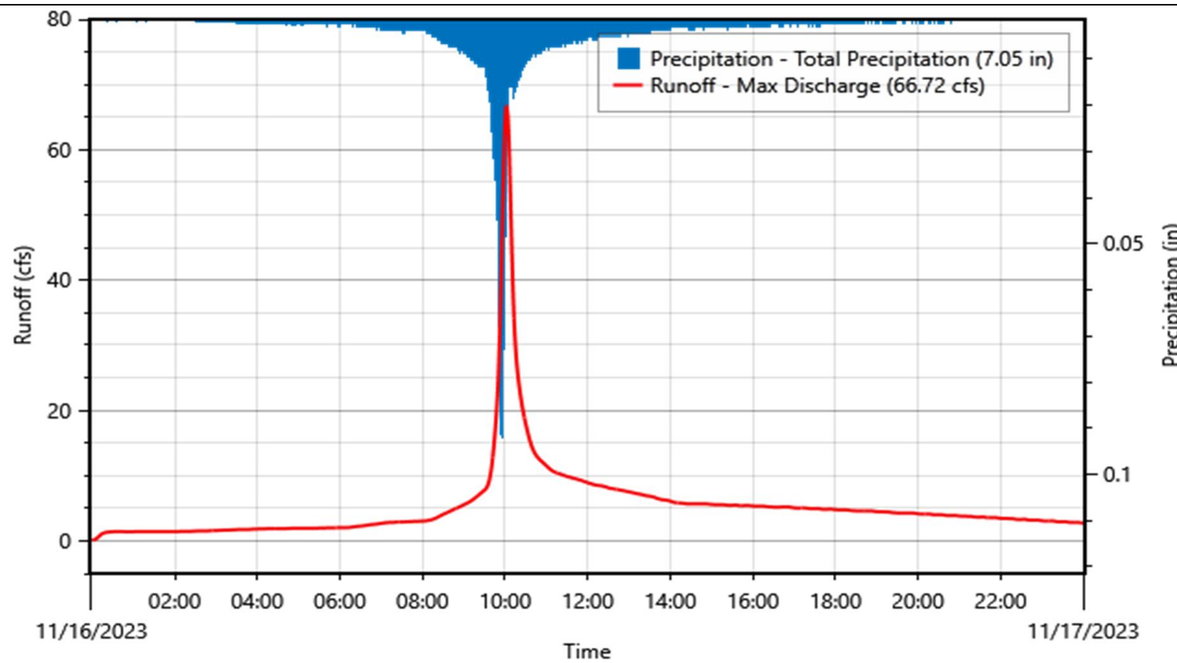
Subbasin ID:	Sub-8-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	66.72 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	42.109 acres	Total rainfall:	7.05 in	24.74080 ac-ft
Initial abstraction:	N/A	Losses:	4.08 in	14.30699 ac-ft
Curve Number:	49.10	Precip excess:	2.97 in	10.43381 ac-ft
Impervious surface:	25.00%	Direct runoff:	2.96 in	10.39344 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.65 minutes	Total runoff:	2.96 in	10.39344 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Undeveloped, Shrub/Scrub	9.960	23.65	71.53
Undefined	Agricultural, Pasture/Hay	0.201	0.48	39.00
Undefined	Developed, Low Density	0.497	1.18	61.00
Undefined	Developed, Open Space	4.762	11.31	64.30
Undefined	Undeveloped, Grassland	26.689	63.38	37.87
Weighted Average		42.109	100.00	49.10

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
9.73	100.00	0.17179	1.5398	Sheet Flow
0.98	500.00	0.27511	17.3206	Shallow Concentrated Flow
3.71	1,514.07	0.04213	6.7780	Channel Flow
14.42	2,114.07	Total	Lag Time = 8.66 minutes	



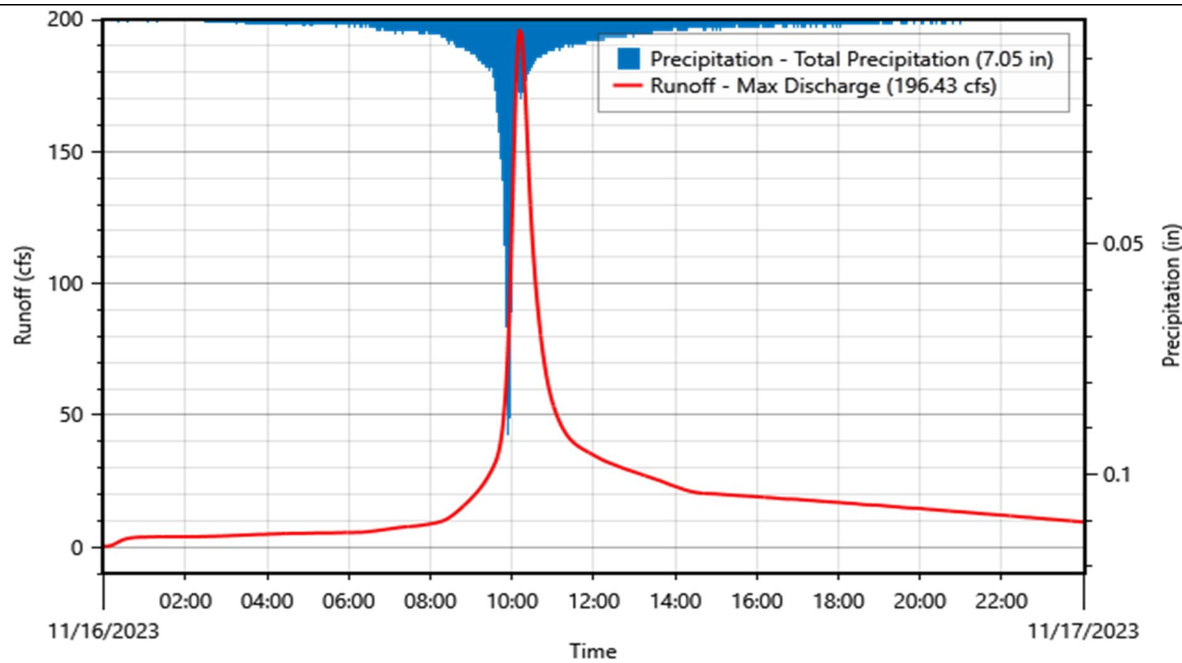
Subbasin ID:	Sub-9-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	196.43 cfs	Time of peak:	16 Nov 2023, 10:12	
Drainage area:	116.229 acres	Total rainfall:	7.05 in	68.28160 ac-ft
Initial abstraction:	N/A	Losses:	3.10 in	30.03573 ac-ft
Curve Number:	62.77	Precip excess:	3.95 in	38.24587 ac-ft
Impervious surface:	25.00%	Direct runoff:	3.92 in	37.94024 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	18.91 minutes	Total runoff:	3.92 in	37.94024 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	3.730	3.21	90.54
Undefined	Developed, Low Density	8.340	7.18	80.36
Undefined	Developed, High Density	0.590	0.51	89.00
Undefined	Developed, Open Space	30.395	26.15	71.48
Undefined	Undeveloped, Barren Land	1.262	1.09	77.00
Undefined	Undeveloped, Grassland	31.574	27.17	38.55
Undefined	Undeveloped, Shrub/Scrub	40.338	34.71	68.14
Weighted Average		116.229	100.00	62.77

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
18.67	100.00	0.03368	0.6818	Sheet Flow
1.61	500.00	0.10360	10.6288	Shallow Concentrated Flow
11.23	3,997.52	0.03209	5.9154	Channel Flow
31.51	4,597.52	Total	Lag Time = 18.91 minutes	



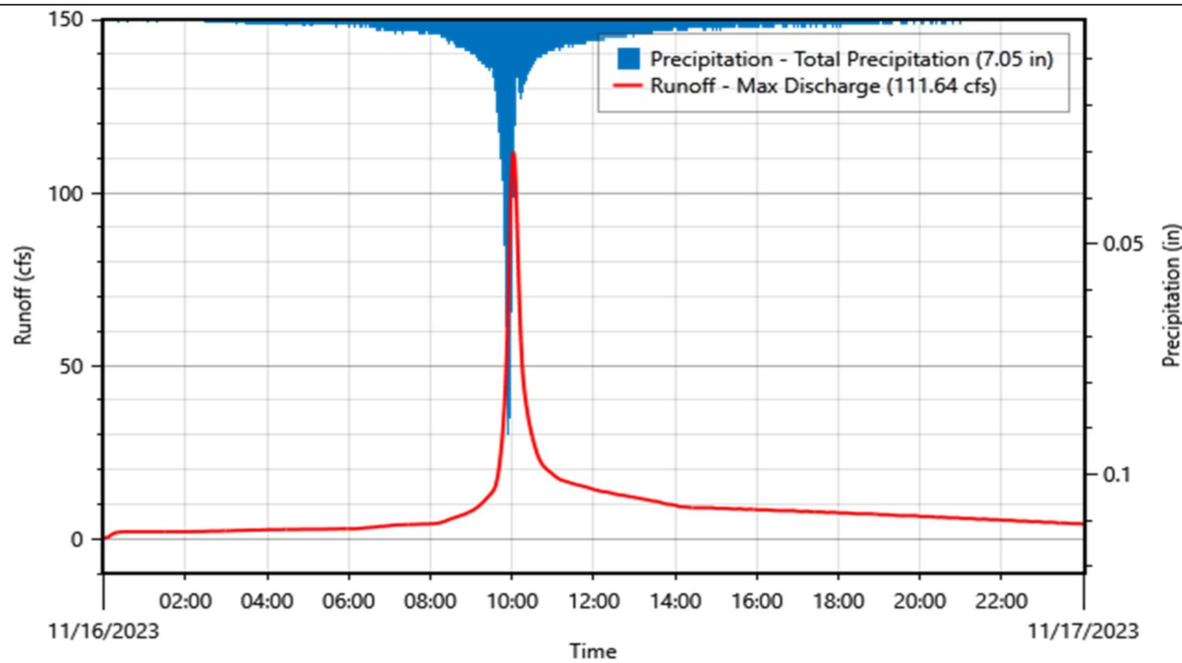
Subbasin ID:	Sub-10-EX			
Scenario:	Ex Condition 100 Year		Depth	Volume
Peak discharge:	111.64 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	59.007 acres	Total rainfall:	7.05 in	34.66720 ac-ft
Initial abstraction:	N/A	Losses:	3.71 in	18.22079 ac-ft
Curve Number:	54.51	Precip excess:	3.34 in	16.44641 ac-ft
Impervious surface:	25.00%	Direct runoff:	3.33 in	16.38366 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.74 minutes	Total runoff:	3.33 in	16.38366 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.001	0.00	77.00
Undefined	Developed, Low Density	1.315	2.23	65.48
Undefined	Developed, High Density	0.471	0.80	92.29
Undefined	Developed, Open Space	7.581	12.85	68.05
Undefined	Undeveloped, Barren Land	6.318	10.71	81.42
Undefined	Undeveloped, Grassland	19.476	33.01	34.57
Undefined	Undeveloped, Shrub/Scrub	23.844	40.41	58.01
Weighted Average		59.007	100.00	54.51

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
8.29	100.00	0.25662	1.8819	Sheet Flow
1.39	500.00	0.13809	12.2714	Shallow Concentrated Flow
4.88	1,693.14	0.03050	5.7674	Channel Flow
14.56	2,293.14	Total	Lag Time = 8.74 minutes	



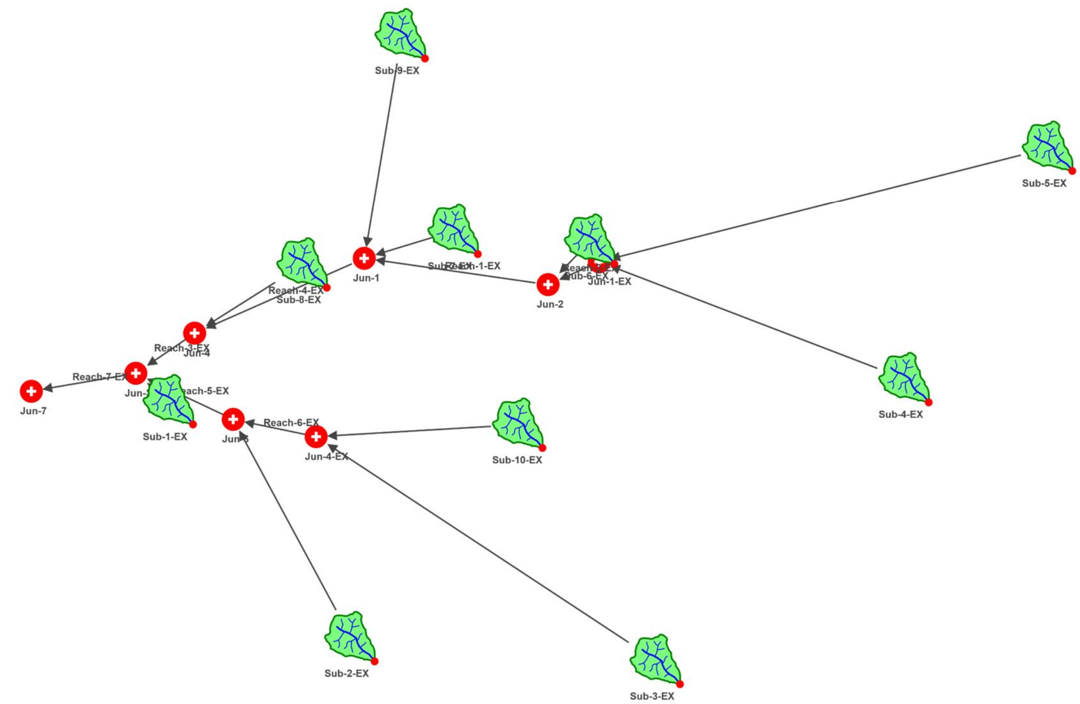
Nodes

Element ID	Element Type	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Diverted Flow (cfs)
Jun-1	Junction	763.00	763.00	
Jun-1-EX	Junction	551.76	551.76	
Jun-2	Junction	559.34	559.34	
Jun-3	Junction	1558.56	1558.56	
Jun-4	Junction	794.67	794.67	
Jun-4-EX	Junction	559.07	559.07	
Jun-6	Junction	671.74	671.74	
Jun-7	Junction	1557.95	1557.95	

Routing Reaches

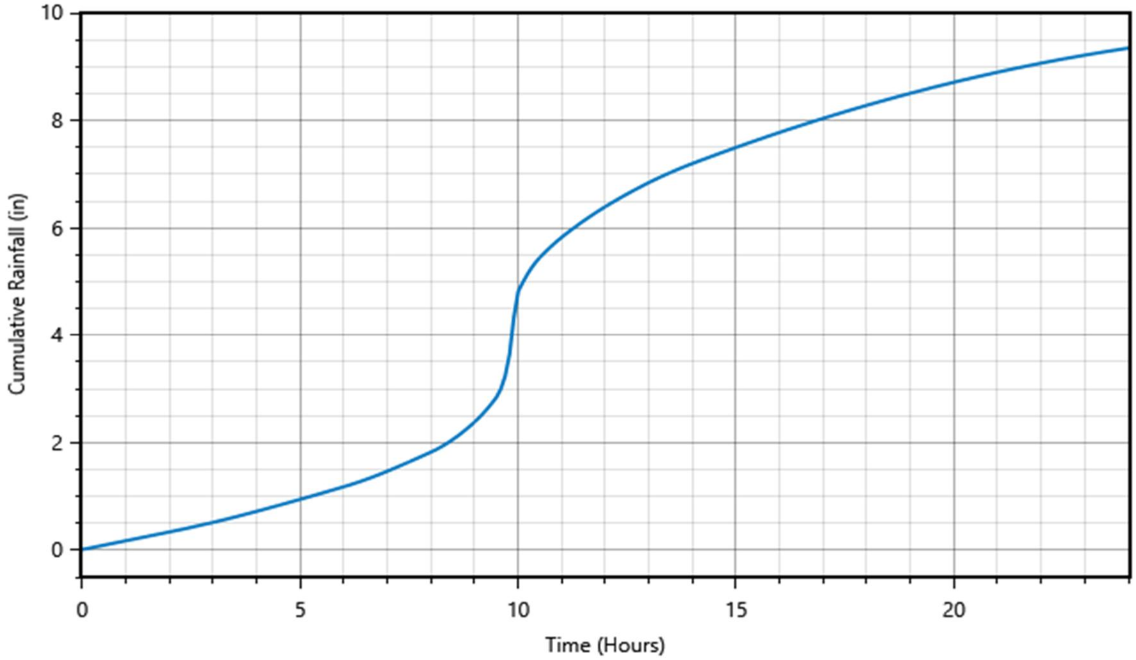
Reach ID	Peak Inflow (cfs)	Peak Outflow (cfs)	Attenuated Flow (cfs)
Reach-1-EX	559.34	559.05	0.29
Reach-2-EX	551.76	551.29	0.47
Reach-3-EX	794.67	794.81	-0.14
Reach-4-EX	763.00	762.39	0.61
Reach-5-EX	671.74	670.66	1.08
Reach-6-EX	559.07	558.67	0.40
Reach-7-EX	1558.56	1557.95	0.61

Ex Condition 500 Year
Watershed Routing Diagram



Design Storm

Precipitation type: SCS Storm
SCS storm distribution: Type I
Rainfall depth: 9.33 in



Watershed Summary

Subbasin ID	Drainage Area (acres)	Initial Abstraction (in)	Curve Number	Impervious Surface (%)	Lag Time (minutes)	Peak Discharge (cfs)
Sub-1-EX	104.817	N/A	65.27	0.89	10.12	328.04
Sub-2-EX	78.204	N/A	58.95	3.51	8.59	216.57
Sub-3-EX	221.228	N/A	69.91	2.42	12.83	718.54
Sub-4-EX	109.433	N/A	70.73	1.76	11.12	384.50
Sub-5-EX	256.583	N/A	70.73	3.27	24.32	612.25
Sub-6-EX	7.259	N/A	60.44	1.82	9.02	20.43
Sub-7-EX	25.897	N/A	42.85	3.70	8.58	30.72
Sub-8-EX	42.109	N/A	49.10	25.00	8.65	111.00
Sub-9-EX	116.229	N/A	62.77	25.00	18.91	303.04
Sub-10-EX	59.007	N/A	54.51	25.00	8.74	179.69

Subbasins

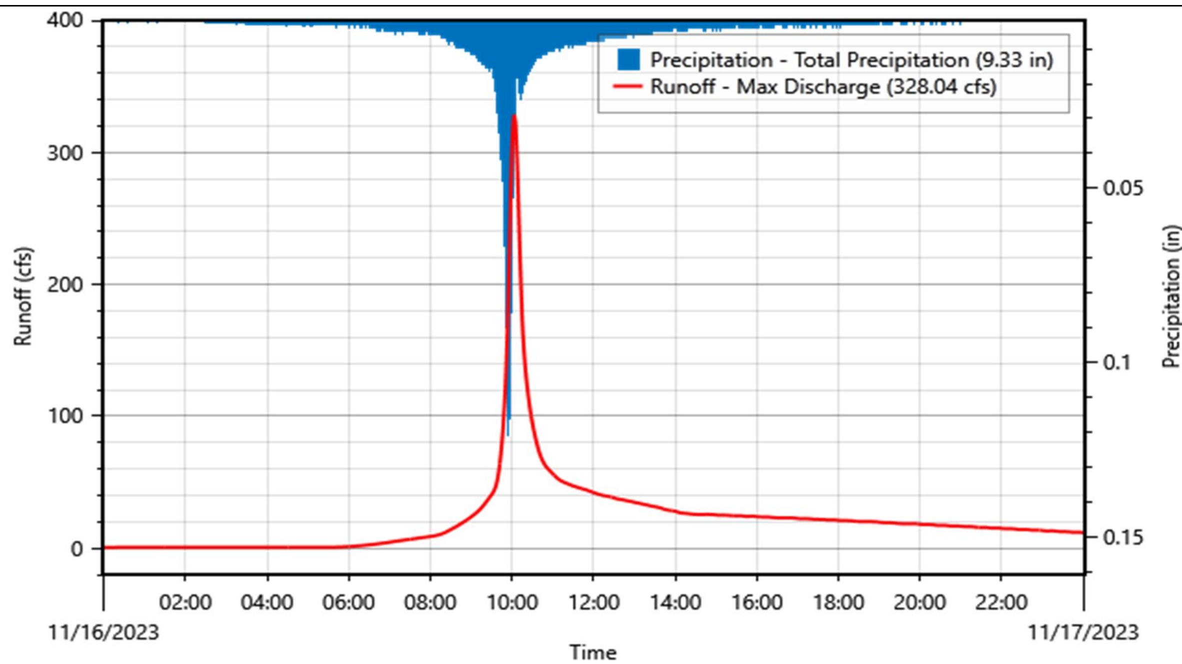
Subbasin ID:	Sub-1-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	328.04 cfs	Time of peak:	16 Nov 2023, 10:03	
Drainage area:	104.817 acres	Total rainfall:	9.33 in	81.49543 ac-ft
Initial abstraction:	N/A	Losses:	4.26 in	37.23669 ac-ft
Curve Number:	65.27	Precip excess:	5.07 in	44.25874 ac-ft
Impervious surface:	0.89%	Direct runoff:	5.04 in	44.05777 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	10.12 minutes	Total runoff:	5.04 in	44.05777 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.338	0.32	90.43
Undefined	Agricultural, Cultivated Crops	0.848	0.81	67.00
Undefined	Agricultural, Pasture/Hay	2.225	2.12	39.00
Undefined	Developed, Low Density	1.170	1.12	84.69
Undefined	Developed, Open Space	11.236	10.72	74.54
Undefined	Undeveloped, Grassland	16.859	16.08	40.98
Undefined	Undeveloped, Shrub/Scrub	72.142	68.83	69.85
Weighted Average		104.817	100.00	65.27

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
11.29	100.00	0.11848	1.2787	Sheet Flow
1.46	500.00	0.12471	11.6615	Shallow Concentrated Flow
4.12	1,973.86	0.05804	7.9557	Channel Flow
16.87	2,573.86	Total	Lag Time = 10.13 minutes	



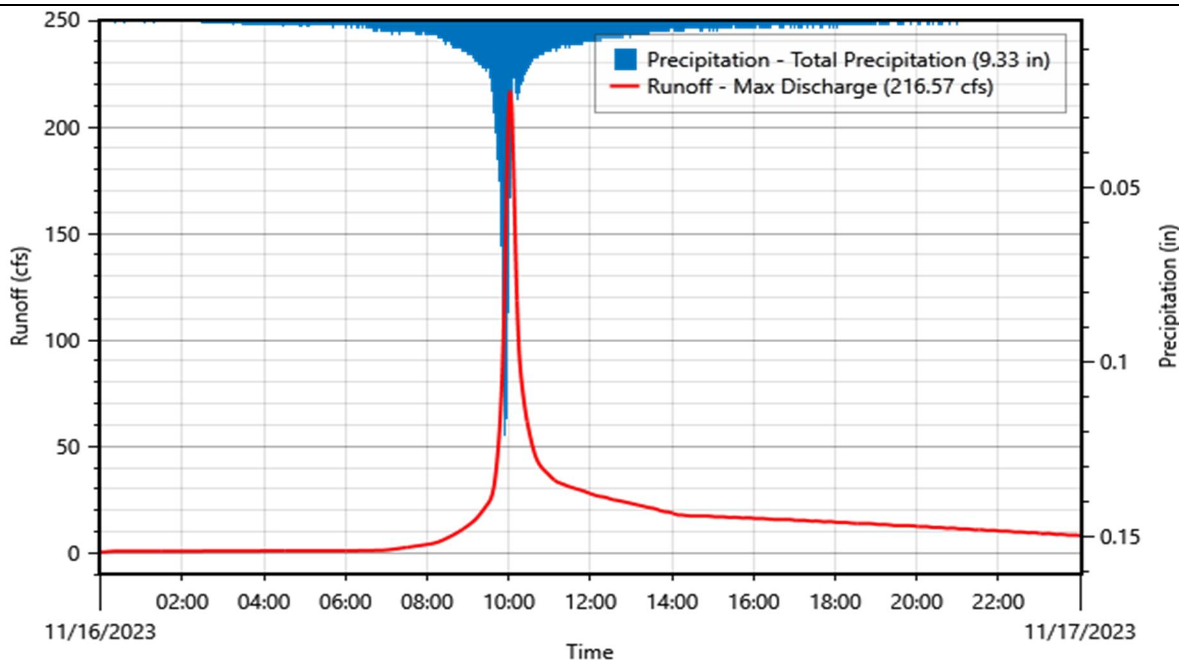
Subbasin ID:	Sub-2-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	216.57 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	78.204 acres	Total rainfall:	9.33 in	60.80373 ac-ft
Initial abstraction:	N/A	Losses:	4.92 in	32.08275 ac-ft
Curve Number:	58.95	Precip excess:	4.41 in	28.72098 ac-ft
Impervious surface:	3.51%	Direct runoff:	4.39 in	28.60286 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.59 minutes	Total runoff:	4.39 in	28.60286 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.964	1.23	84.47
Undefined	Developed, Low Density	1.848	2.36	62.18
Undefined	Developed, High Density	0.000	0.00	89.00
Undefined	Developed, Open Space	12.763	16.32	72.41
Undefined	Undeveloped, Barren Land	0.000	0.00	77.00
Undefined	Undeveloped, Grassland	23.749	30.37	31.29
Undefined	Undeveloped, Shrub/Scrub	38.880	49.72	70.65
Weighted Average		78.204	100.00	58.95

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
6.37	100.00	0.49617	2.6168	Sheet Flow
0.96	500.00	0.28890	17.7493	Shallow Concentrated Flow
6.99	3,279.23	0.05582	7.8019	Channel Flow
14.32	3,879.23	Total	Lag Time = 8.60 minutes	



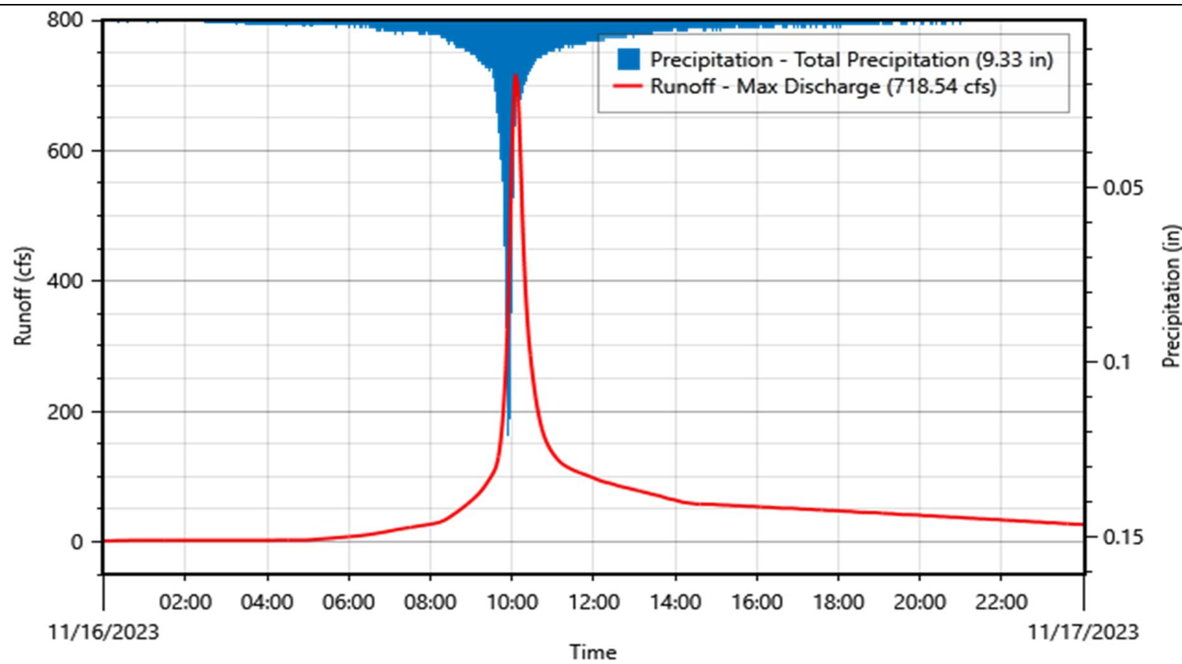
Subbasin ID:	Sub-3-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	718.54 cfs	Time of peak:	16 Nov 2023, 10:06	
Drainage area:	221.228 acres	Total rainfall:	9.33 in	172.00489 ac-ft
Initial abstraction:	N/A	Losses:	3.62 in	66.82408 ac-ft
Curve Number:	69.91	Precip excess:	5.71 in	105.18081 ac-ft
Impervious surface:	2.42%	Direct runoff:	5.67 in	104.61375 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	12.83 minutes	Total runoff:	5.67 in	104.61375 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	2.642	1.19	78.02
Undefined	Developed, Low Density	3.110	1.41	73.33
Undefined	Developed, High Density	0.774	0.35	89.00
Undefined	Developed, Open Space	25.613	11.58	73.70
Undefined	Undeveloped, Barren Land	4.692	2.12	77.00
Undefined	Undeveloped, Grassland	13.872	6.27	44.29
Undefined	Undeveloped, Shrub/Scrub	170.526	77.08	70.95
Weighted Average		221.228	100.00	69.91

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
10.25	100.00	0.15099	1.4435	Sheet Flow
1.25	500.00	0.16977	13.6062	Shallow Concentrated Flow
9.88	5,292.53	0.07267	8.9020	Channel Flow
21.38	5,892.53	Total	Lag Time = 12.83 minutes	



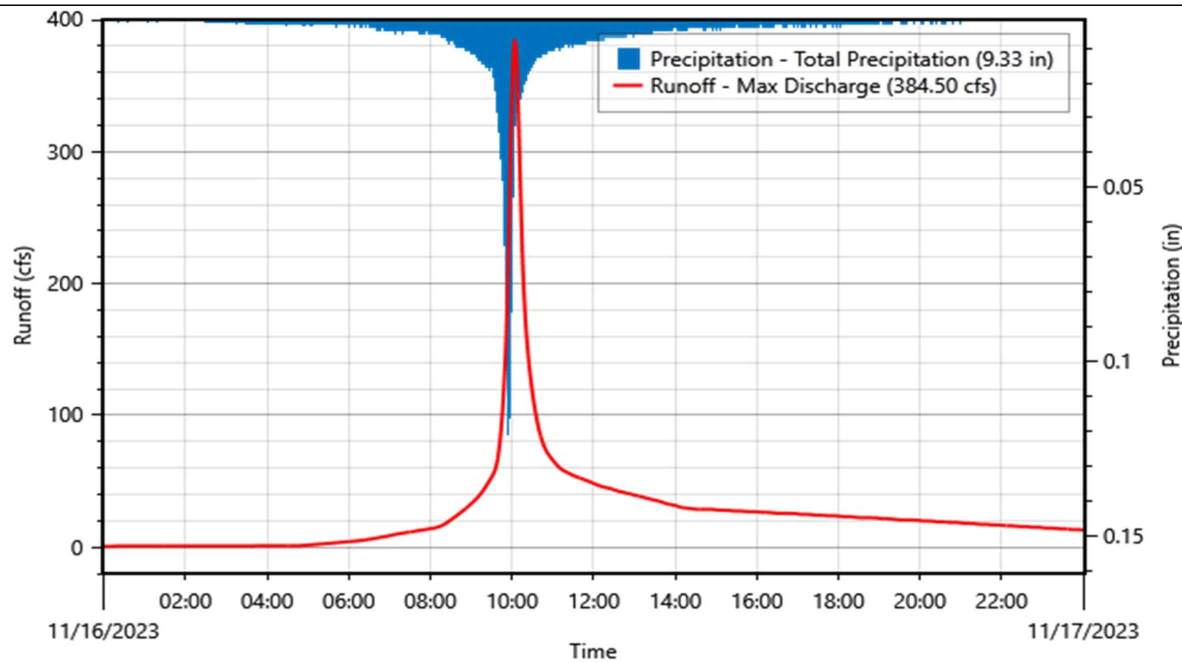
Subbasin ID:	Sub-4-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	384.50 cfs	Time of peak:	16 Nov 2023, 10:04	
Drainage area:	109.433 acres	Total rainfall:	9.33 in	85.08412 ac-ft
Initial abstraction:	N/A	Losses:	3.55 in	32.35191 ac-ft
Curve Number:	70.73	Precip excess:	5.78 in	52.73221 ac-ft
Impervious surface:	1.76%	Direct runoff:	5.76 in	52.48844 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	11.12 minutes	Total runoff:	5.76 in	52.48844 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.149	0.14	85.00
Undefined	Undeveloped, Evergreen Forest	0.434	0.40	37.15
Undefined	Developed, Low Density	1.157	1.06	74.97
Undefined	Developed, Open Space	6.174	5.64	75.28
Undefined	Undeveloped, Grassland	2.188	2.00	62.33
Undefined	Undeveloped, Shrub/Scrub	99.331	90.77	70.71
Weighted Average		109.433	100.00	70.73

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
9.61	100.00	0.17735	1.5645	Sheet Flow
1.83	500.00	0.07945	9.3077	Shallow Concentrated Flow
7.09	4,346.86	0.09511	10.1840	Channel Flow
18.53	4,946.86	Total	Lag Time = 11.12 minutes	



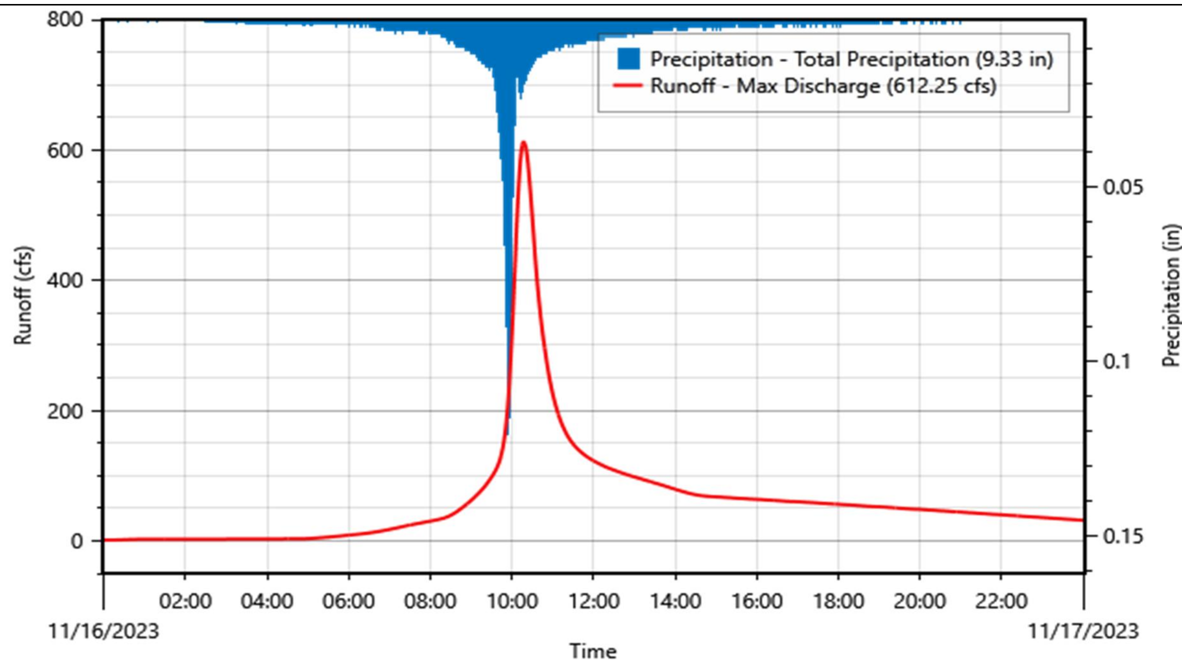
Subbasin ID:	Sub-5-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	612.25 cfs	Time of peak:	16 Nov 2023, 10:17	
Drainage area:	256.583 acres	Total rainfall:	9.33 in	199.49331 ac-ft
Initial abstraction:	N/A	Losses:	3.49 in	74.68831 ac-ft
Curve Number:	70.73	Precip excess:	5.84 in	124.80500 ac-ft
Impervious surface:	3.27%	Direct runoff:	5.78 in	123.52215 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	24.32 minutes	Total runoff:	5.78 in	123.52215 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Wetlands, Forested	1.146	0.45	100.00
Undefined	Developed, Medium Density	3.229	1.26	89.55
Undefined	Undeveloped, Evergreen Forest	1.530	0.60	65.18
Undefined	Developed, Low Density	9.854	3.84	83.32
Undefined	Developed, Open Space	24.543	9.57	81.02
Undefined	Undeveloped, Grassland	13.325	5.19	72.66
Undefined	Undeveloped, Shrub/Scrub	202.958	79.10	68.33
Weighted Average		256.583	100.00	70.73

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
19.55	100.00	0.00001	0.0117	Sheet Flow
5.97	1,000.00	0.00001	0.1044	Shallow Concentrated Flow
15.01	6,306.87	0.04475	6.9858	Channel Flow
40.53	7,406.87	Total	Lag Time = 24.32 minutes	



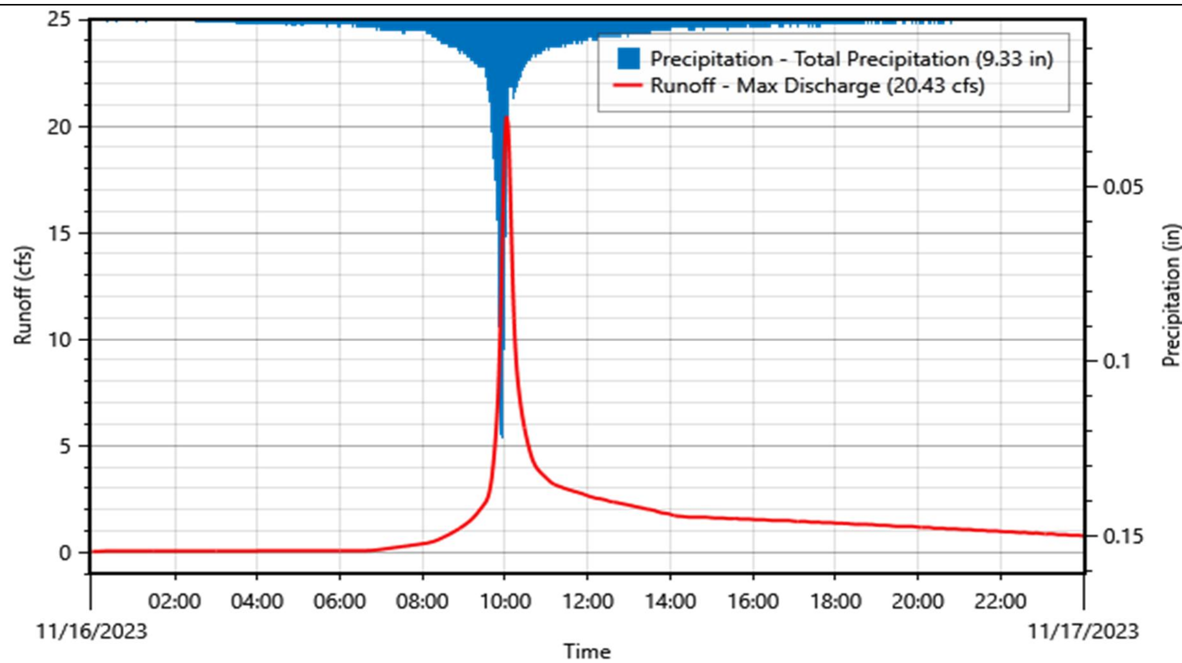
Subbasin ID:	Sub-6-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	20.43 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	7.259 acres	Total rainfall:	9.33 in	5.64378 ac-ft
Initial abstraction:	N/A	Losses:	4.82 in	2.91797 ac-ft
Curve Number:	60.44	Precip excess:	4.51 in	2.72581 ac-ft
Impervious surface:	1.82%	Direct runoff:	4.49 in	2.71410 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	9.02 minutes	Total runoff:	4.49 in	2.71410 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Wetlands, Forested	0.060	0.83	100.00
Undefined	Undeveloped, Evergreen Forest	0.297	4.09	30.00
Undefined	Developed, Open Space	2.424	33.40	73.28
Undefined	Undeveloped, Grassland	1.568	21.60	50.55
Undefined	Undeveloped, Shrub/Scrub	2.909	40.08	57.35
Weighted Average		7.259	100.00	60.44

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
6.42	100.00	0.48484	2.5868	Sheet Flow
0.85	300.00	0.13295	12.0407	Shallow Concentrated Flow
1.24	511.49	0.04337	6.8770	Channel Flow
8.51	911.49	Total	Lag Time = 5.11 minutes	



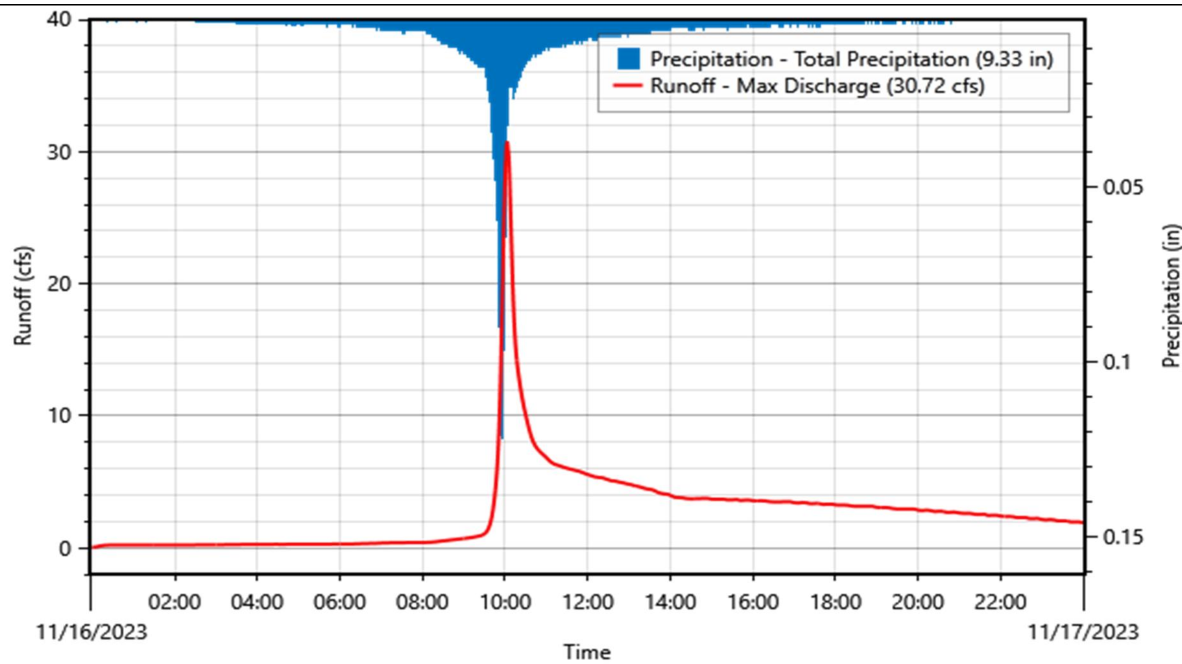
Subbasin ID:	Sub-7-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	30.72 cfs	Time of peak:	16 Nov 2023, 10:03	
Drainage area:	25.897 acres	Total rainfall:	9.33 in	20.13489 ac-ft
Initial abstraction:	N/A	Losses:	6.85 in	14.77725 ac-ft
Curve Number:	42.85	Precip excess:	2.48 in	5.35764 ac-ft
Impervious surface:	3.70%	Direct runoff:	2.47 in	5.32935 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.58 minutes	Total runoff:	2.47 in	5.32935 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Undeveloped, Shrub/Scrub	3.397	13.12	53.02
Undefined	Developed, Low Density	0.710	2.74	61.00
Undefined	Developed, Open Space	2.166	8.36	64.81
Undefined	Undeveloped, Grassland	19.623	75.78	38.01
Weighted Average		25.897	100.00	42.85

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
8.87	100.00	0.21656	1.7288	Sheet Flow
1.74	500.00	0.08837	9.8165	Shallow Concentrated Flow
3.69	857.85	0.01372	3.8680	Channel Flow
14.30	1,457.85	Total	Lag Time = 8.58 minutes	



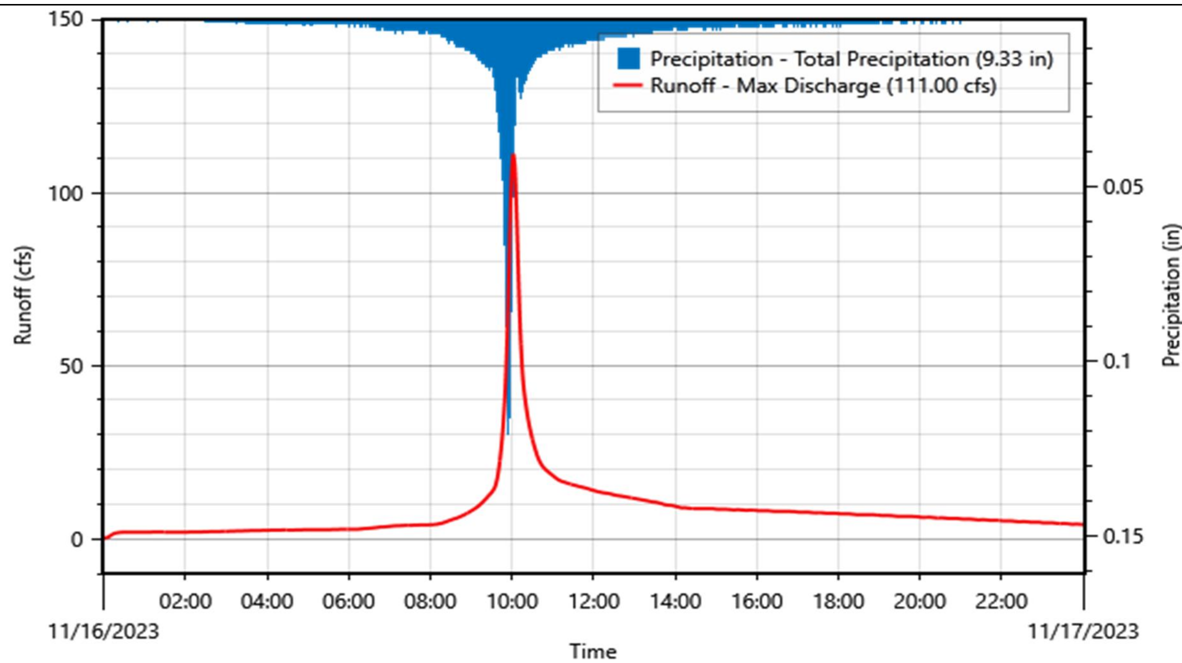
Subbasin ID:	Sub-8-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	111.00 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	42.109 acres	Total rainfall:	9.33 in	32.73959 ac-ft
Initial abstraction:	N/A	Losses:	4.76 in	16.69072 ac-ft
Curve Number:	49.10	Precip excess:	4.57 in	16.04887 ac-ft
Impervious surface:	25.00%	Direct runoff:	4.56 in	15.98878 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.65 minutes	Total runoff:	4.56 in	15.98878 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Undeveloped, Shrub/Scrub	9.960	23.65	71.53
Undefined	Agricultural, Pasture/Hay	0.201	0.48	39.00
Undefined	Developed, Low Density	0.497	1.18	61.00
Undefined	Developed, Open Space	4.762	11.31	64.30
Undefined	Undeveloped, Grassland	26.689	63.38	37.87
Weighted Average		42.109	100.00	49.10

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
9.73	100.00	0.17179	1.5398	Sheet Flow
0.98	500.00	0.27511	17.3206	Shallow Concentrated Flow
3.71	1,514.07	0.04213	6.7780	Channel Flow
14.42	2,114.07	Total	Lag Time = 8.66 minutes	



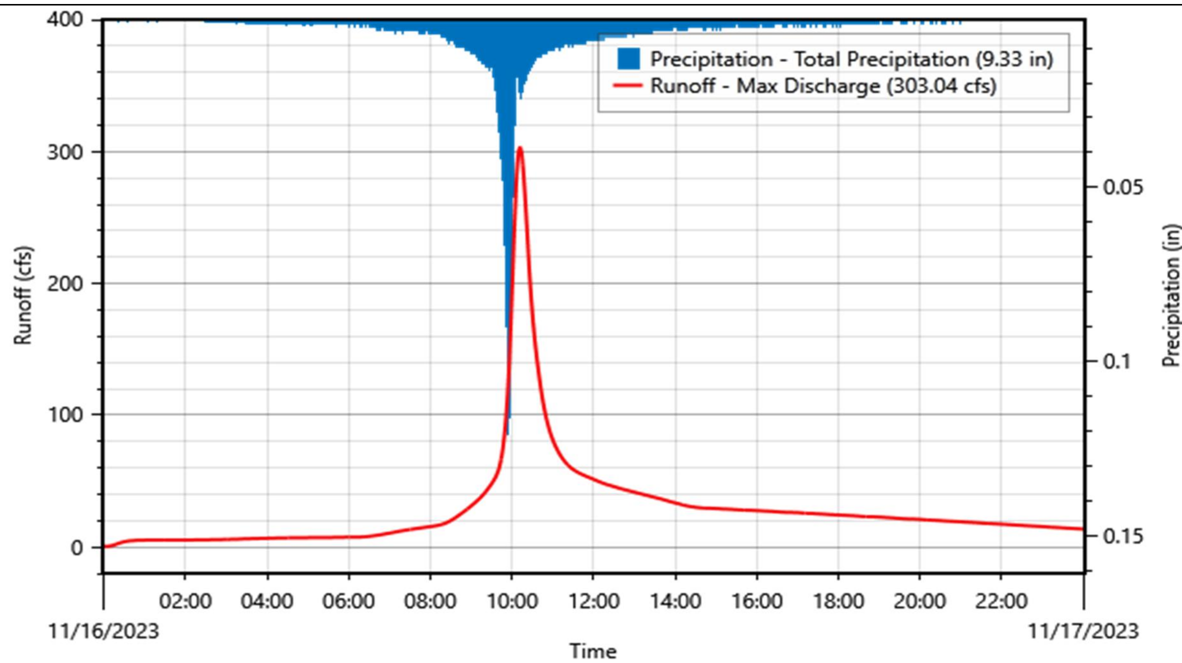
Subbasin ID:	Sub-9-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	303.04 cfs	Time of peak:	16 Nov 2023, 10:12	
Drainage area:	116.229 acres	Total rainfall:	9.33 in	90.36814 ac-ft
Initial abstraction:	N/A	Losses:	3.46 in	33.54674 ac-ft
Curve Number:	62.77	Precip excess:	5.87 in	56.82139 ac-ft
Impervious surface:	25.00%	Direct runoff:	5.82 in	56.38860 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	18.91 minutes	Total runoff:	5.82 in	56.38860 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	3.730	3.21	90.54
Undefined	Developed, Low Density	8.340	7.18	80.36
Undefined	Developed, High Density	0.590	0.51	89.00
Undefined	Developed, Open Space	30.395	26.15	71.48
Undefined	Undeveloped, Barren Land	1.262	1.09	77.00
Undefined	Undeveloped, Grassland	31.574	27.17	38.55
Undefined	Undeveloped, Shrub/Scrub	40.338	34.71	68.14
Weighted Average		116.229	100.00	62.77

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
18.67	100.00	0.03368	0.6818	Sheet Flow
1.61	500.00	0.10360	10.6288	Shallow Concentrated Flow
11.23	3,997.52	0.03209	5.9154	Channel Flow
31.51	4,597.52	Total	Lag Time = 18.91 minutes	



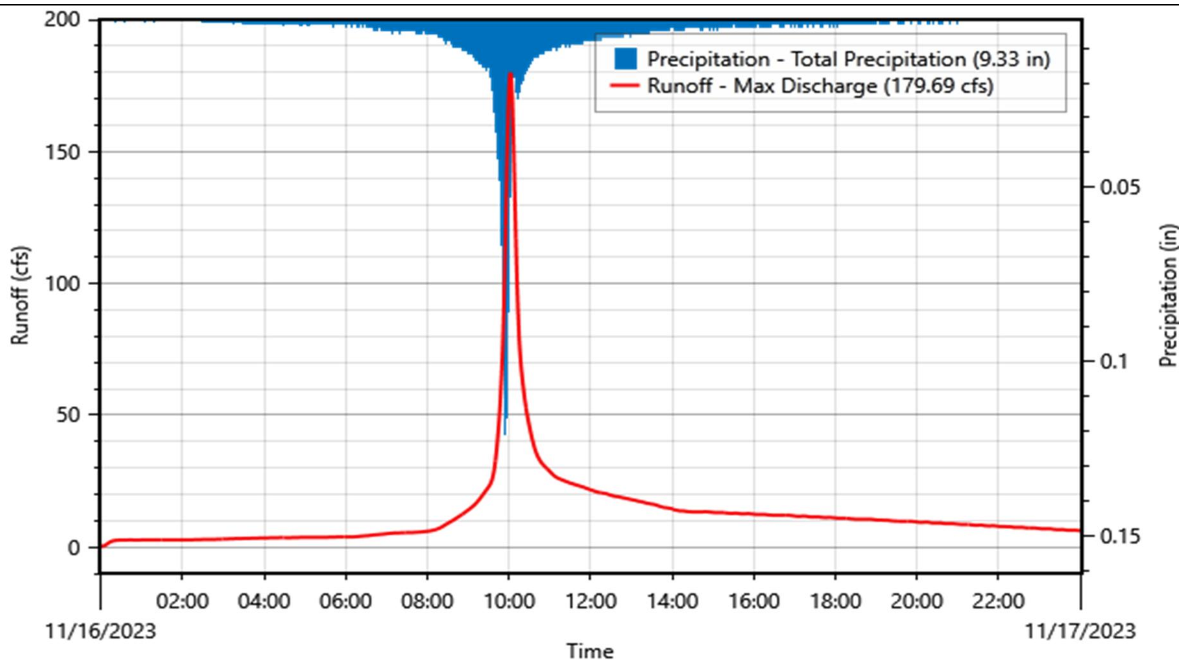
Subbasin ID:	Sub-10-EX			
Scenario:	Ex Condition 500 Year		Depth	Volume
Peak discharge:	179.69 cfs	Time of peak:	16 Nov 2023, 10:02	
Drainage area:	59.007 acres	Total rainfall:	9.33 in	45.87772 ac-ft
Initial abstraction:	N/A	Losses:	4.25 in	20.88576 ac-ft
Curve Number:	54.51	Precip excess:	5.08 in	24.99197 ac-ft
Impervious surface:	25.00%	Direct runoff:	5.06 in	24.90047 ac-ft
Peaking factor:	484	Baseflow:	0.00 in	0.00000 ac-ft
Lag time:	8.74 minutes	Total runoff:	5.06 in	24.90047 ac-ft

Weighted Curve Number Calculations

Soil Group	Land Use Description	Area (acres)	Area (%)	Composite CN
Undefined	Developed, Medium Density	0.001	0.00	77.00
Undefined	Developed, Low Density	1.315	2.23	65.48
Undefined	Developed, High Density	0.471	0.80	92.29
Undefined	Developed, Open Space	7.581	12.85	68.05
Undefined	Undeveloped, Barren Land	6.318	10.71	81.42
Undefined	Undeveloped, Grassland	19.476	33.01	34.57
Undefined	Undeveloped, Shrub/Scrub	23.844	40.41	58.01
Weighted Average		59.007	100.00	54.51

Time of Concentration (TOC) / Lag time Calculations

TOC (min)	Length (ft)	Slope (ft/ft)	Velocity (ft/s)	Description
8.29	100.00	0.25662	1.8819	Sheet Flow
1.39	500.00	0.13809	12.2714	Shallow Concentrated Flow
4.88	1,693.14	0.03050	5.7674	Channel Flow
14.56	2,293.14	Total	Lag Time = 8.74 minutes	



Nodes

Element ID	Element Type	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Diverted Flow (cfs)
Jun-1	Junction	1200.82	1200.82	
Jun-1-EX	Junction	865.23	865.23	
Jun-2	Junction	879.09	879.09	
Jun-3	Junction	2520.48	2520.48	
Jun-4	Junction	1256.93	1256.93	
Jun-4-EX	Junction	883.41	883.41	
Jun-6	Junction	1082.51	1082.51	
Jun-7	Junction	2518.89	2518.89	

Routing Reaches

Reach ID	Peak Inflow (cfs)	Peak Outflow (cfs)	Attenuated Flow (cfs)
Reach-1-EX	879.09	878.72	0.37
Reach-2-EX	865.23	865.10	0.13
Reach-3-EX	1256.93	1256.99	-0.06
Reach-4-EX	1200.82	1200.25	0.57
Reach-5-EX	1082.51	1080.90	1.61
Reach-6-EX	883.41	882.42	0.99
Reach-7-EX	2520.48	2518.89	1.59

APPENDIX C – HYDRAULIC MAPS

2D HYDRAULIC MODEL LAYOUT

EXISTING CONDITION HYDRAULIC WORK MAP

EXISTING CONDITION WITH ENCROACHMENTS HYDRAULIC WORK MAP

FEMA FIRM PANEL MAP

EXISTING CONDITION BFE CONTOUR MAP

EXISTING CONDITION WITH ENCROACHMENTS BFE CONTOUR MAP

100-YEAR EXISTING CONDITION INUNDATION MAP

100-YEAR EXISTING CONDITION WITH ENCROACHMENTS INUNDATION MAP

500-YEAR EXISTING CONDITION INUNDATION MAP

500-YEAR EXISTING CONDITION WITH ENCROACHMENTS INUNDATION MAP

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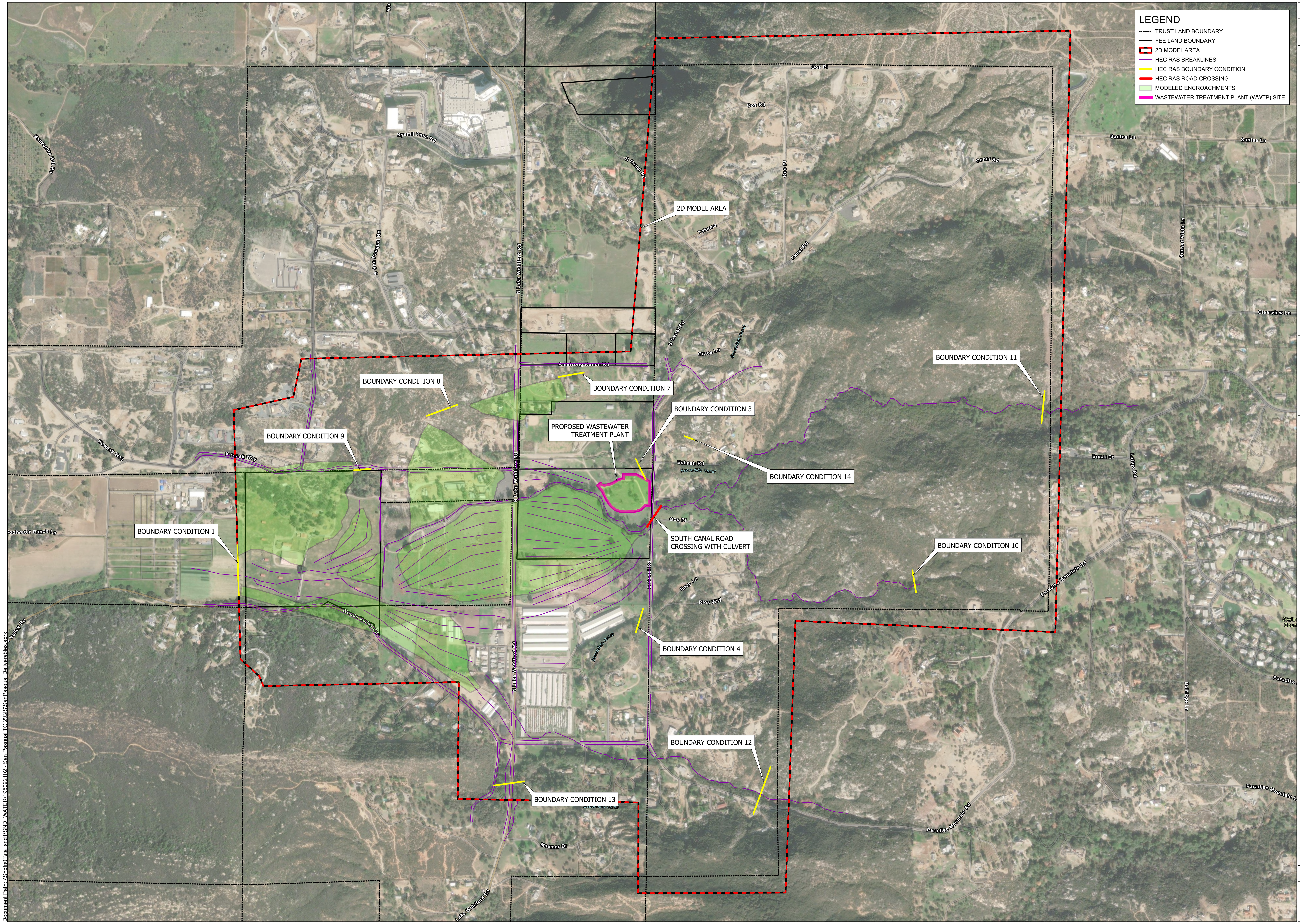

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REVIEW: MD

Kimley»Horn
401 B STREET #600
SAN DIEGO, CA 92101
PHONE: (619) 234-9411

N
1 inch = 400 feet

SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

2D HYDRAULIC MODEL LAYOUT

DATE
JANUARY 2024

PROJECT NO.
195092102

SHEET NUMBER
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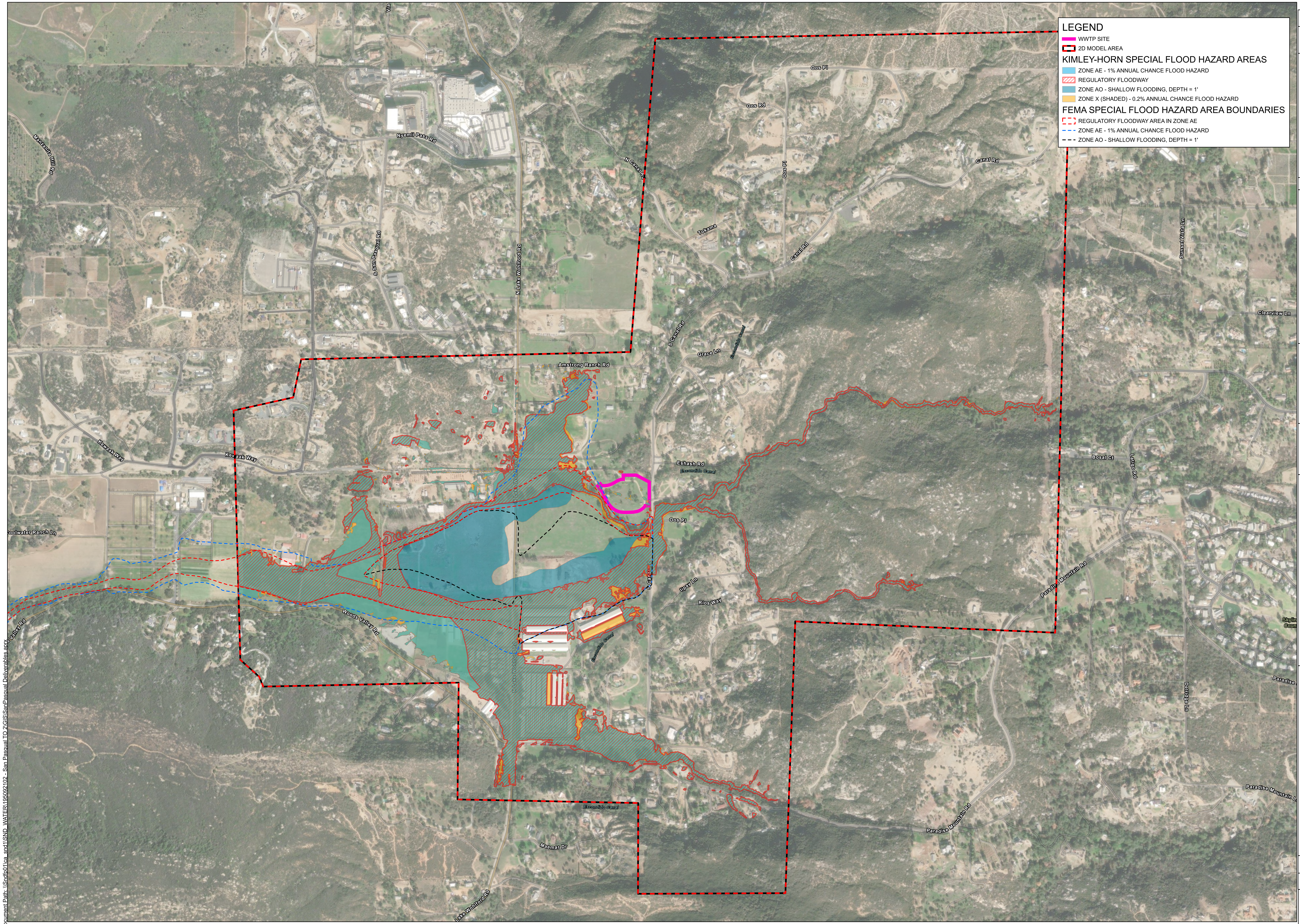

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1 inch = 400 feet

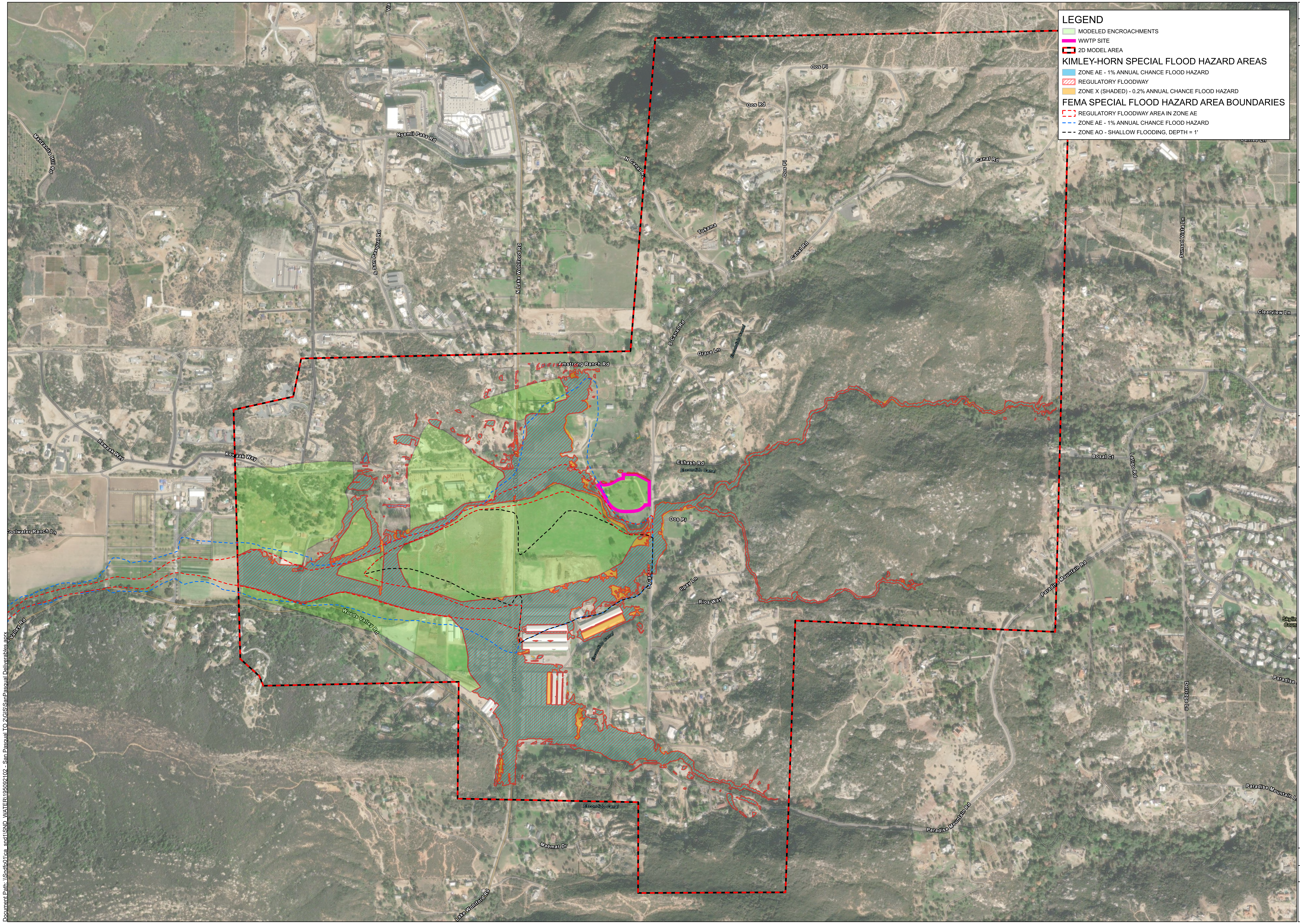
SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

HYDRAULIC WORK MAP EXISTING CONDITION

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
2



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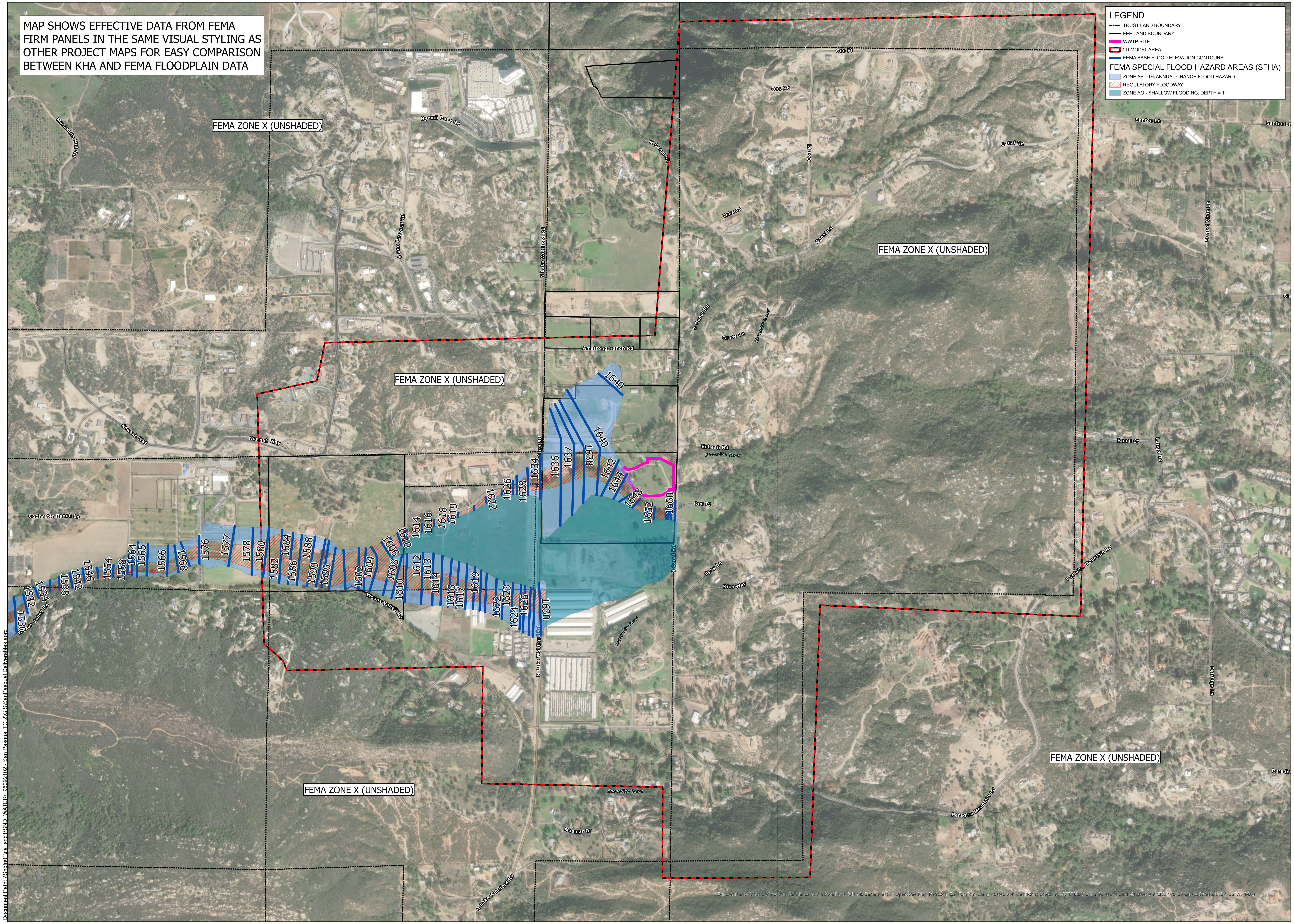
SAN DIEGO, CA

HYDRAULIC WORK MAP EXISTING CONDITION WITH ENCROACHMENTS

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
3



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11 NORTH WATER STREET, SUITE 9290
MOBILE, AL 36602
PHONE: 630-487-3441

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SAN PASQUAL RESERVATION
SAN DIEGO, CA

FEMA FIRM PANEL MAP

DATE
MARCH 2024

PROJECT NO.
268538000

SHEET NUMBER
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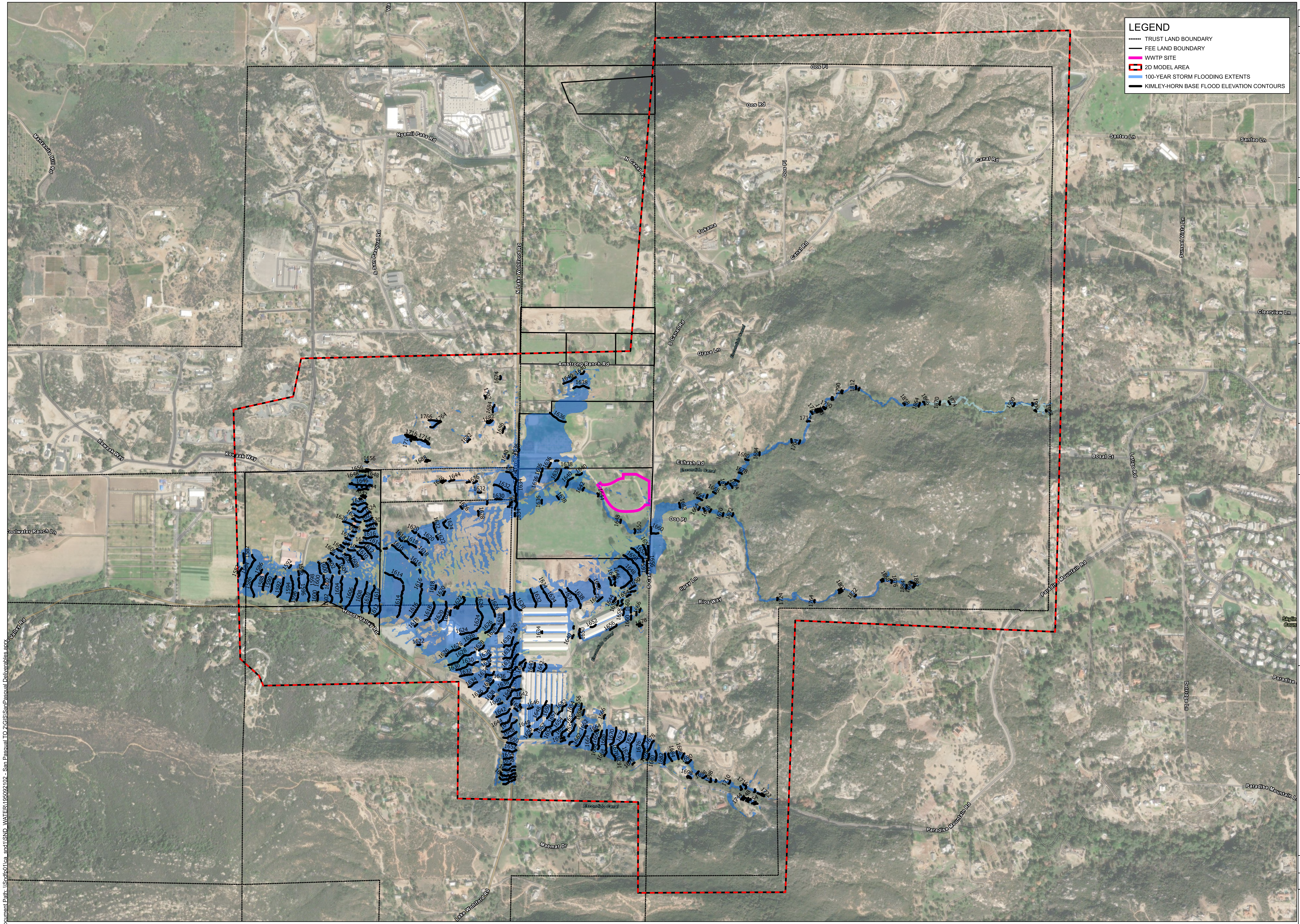

1 inch = 400 feet

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REVIEW: MD

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SAN DIEGO, CA 92101
PHONE: (619) 234-9411

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SAN PASQUAL RESERVATION
SAN DIEGO, CA

BASE FLOOD ELEVATION (BFE) CONTOUR MAP
EXISTING CONDITION

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
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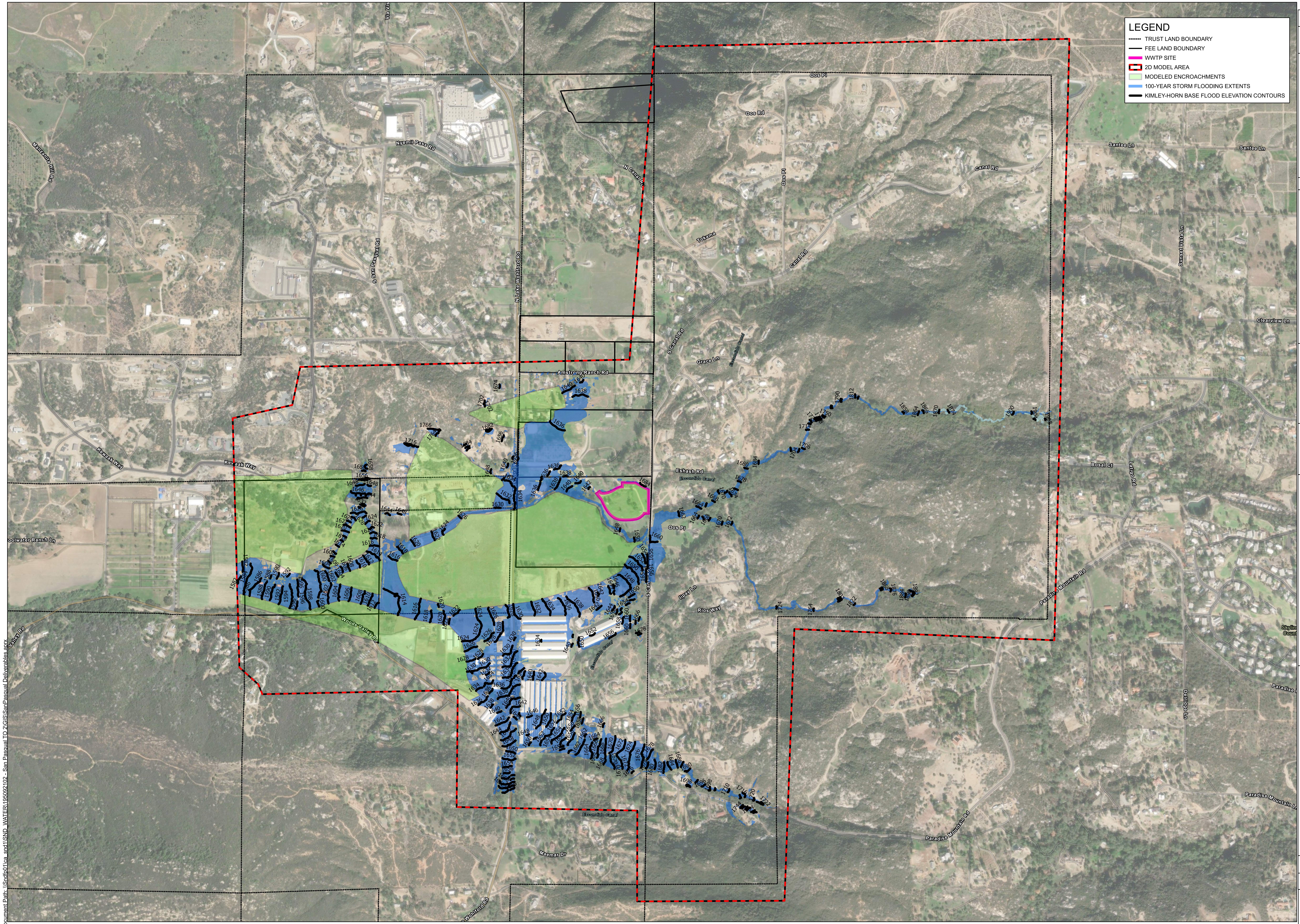

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N
1 inch = 400 feet

SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

BASE FLOOD ELEVATION (BFE) CONTOUR MAP EXISTING CONDITION WITH ENCROACHMENTS

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
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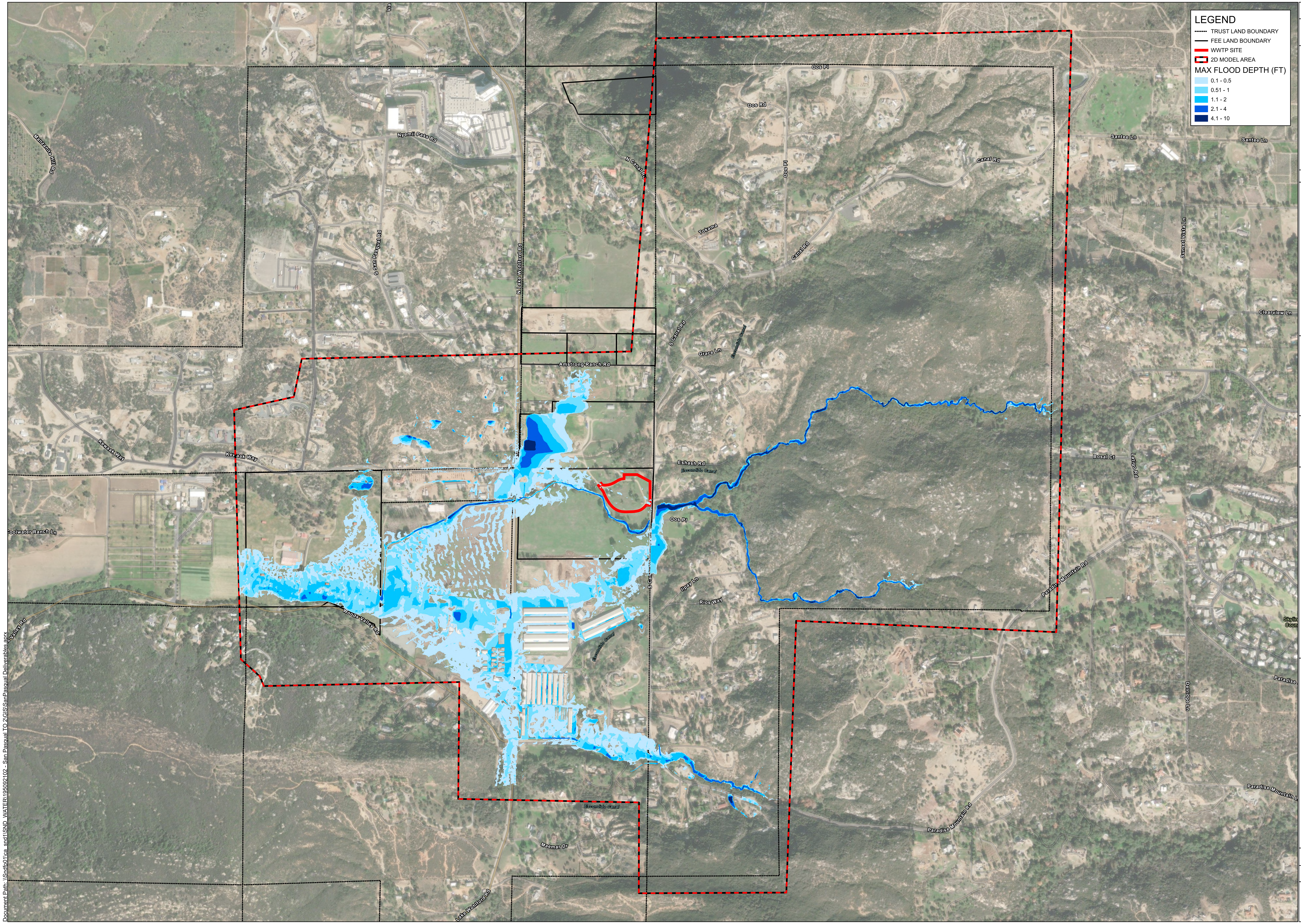

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401 B STREET #600
SAN DIEGO, CA 92101
PHONE: (619) 234-9411

N
1 inch = 400 feet

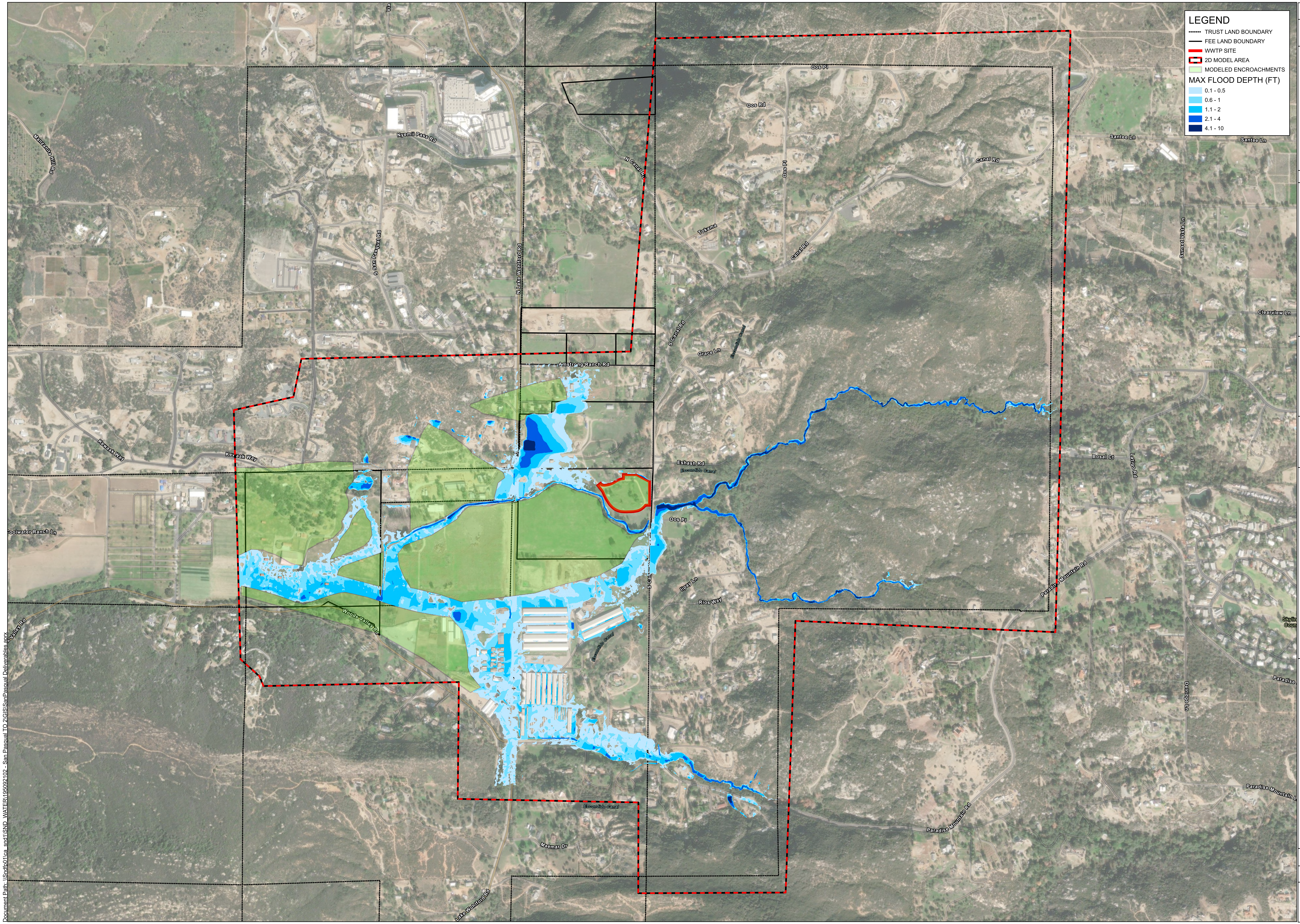
SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

100-YEAR
INUNDATION MAP
EXISTING CONDITION

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
7



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PHONE: (619) 234-9411

N
1 inch = 400 feet

SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

100-YEAR INUNDATION MAP EXISTING CONDITION WITH ENCROACHMENTS

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
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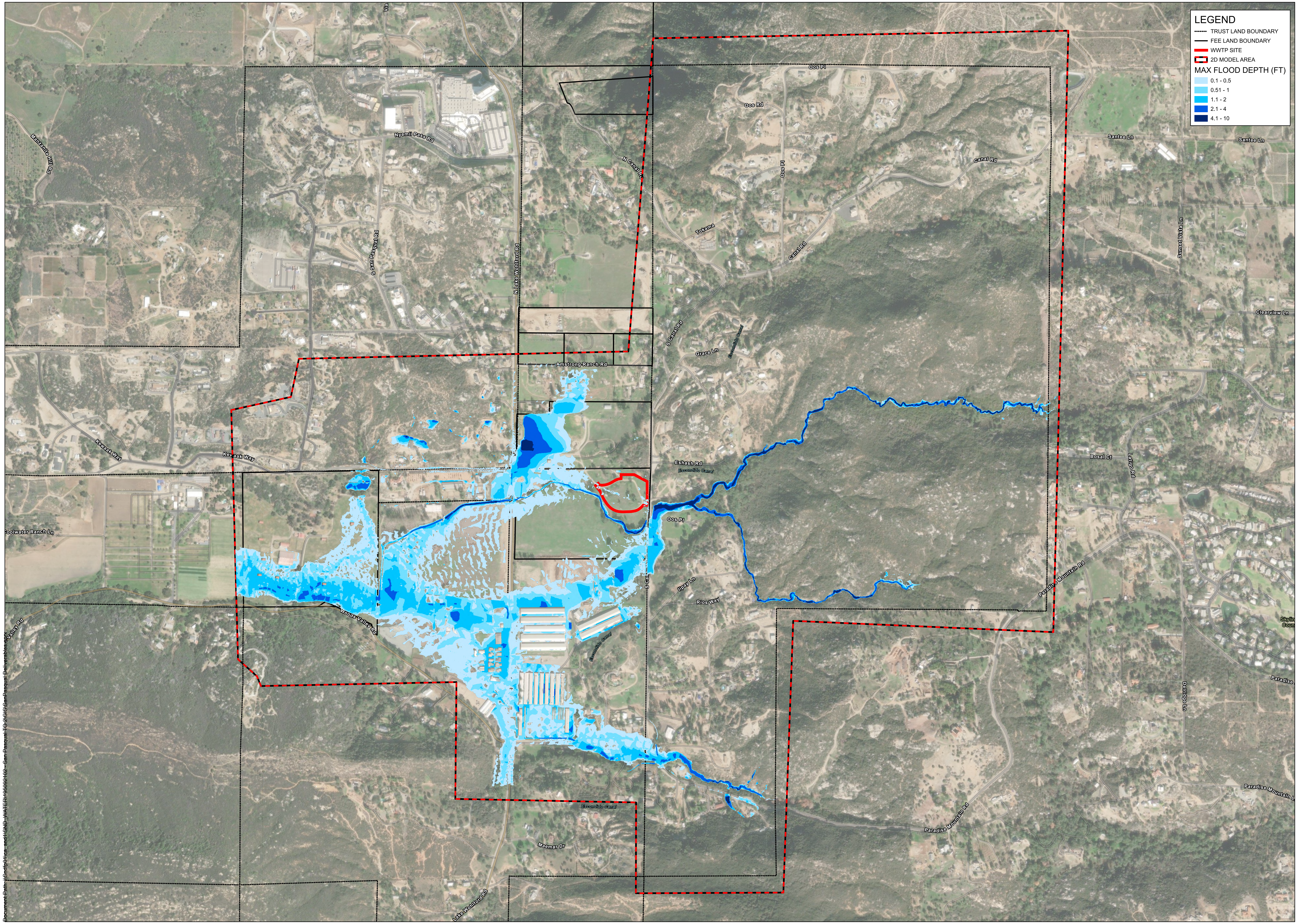

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401 B STREET #500
SAN DIEGO, CA 92101
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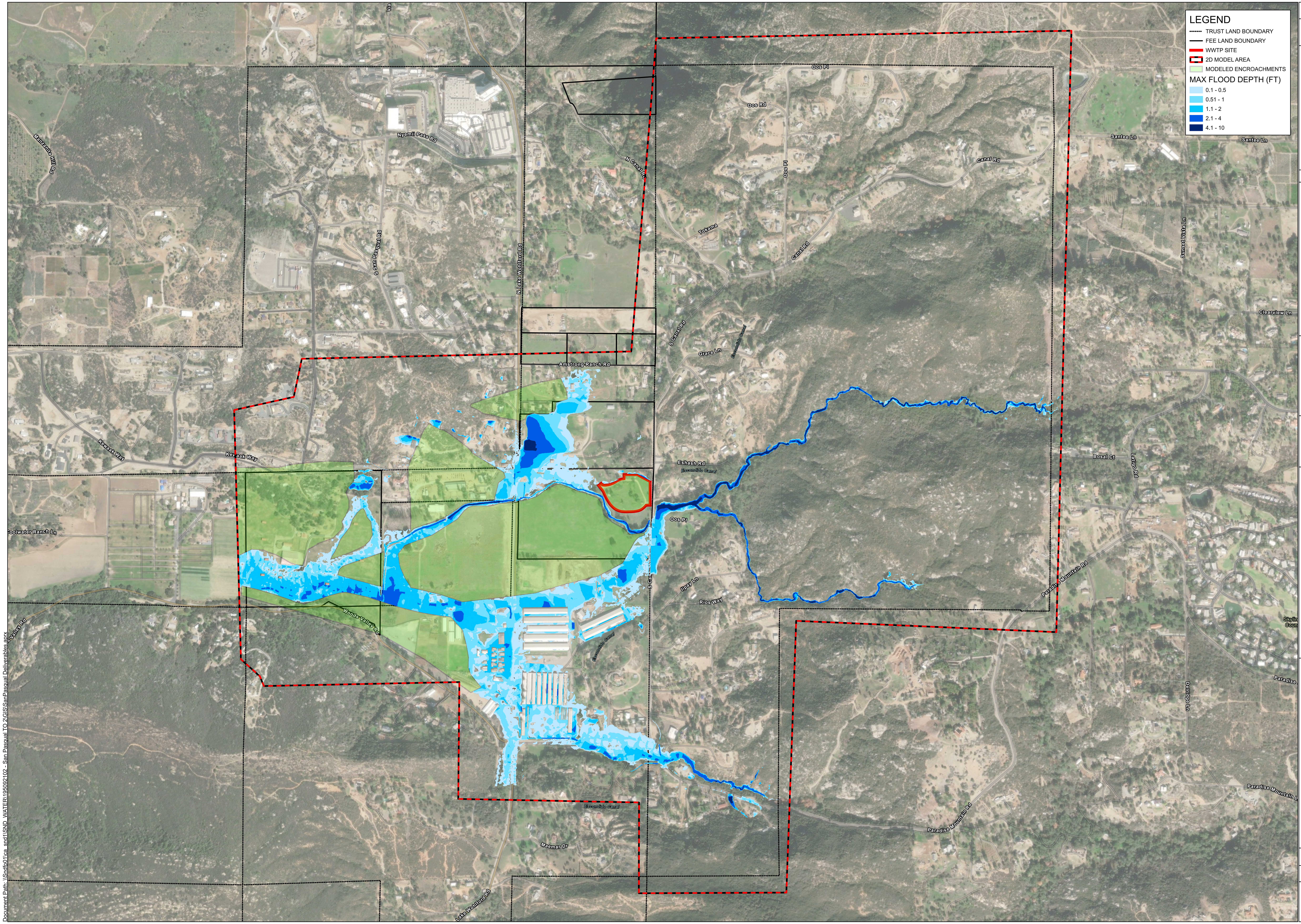
SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

500-YEAR
INUNDATION MAP
EXISTING CONDITION

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
9



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DESIGN:	MAD
DRAWN:	SMW
REVIEW:	MD

Kimley»Horn
401 B STREET #600
SAN DIEGO, CA 92101
PHONE: (619) 234-9411

SAN PASQUAL TO #2
SAN PASQUAL RESERVATION
SAN DIEGO, CA

500-YEAR INUNDATION MAP EXISTING CONDITION WITH ENROACHMENTS

DATE
MARCH 2024

PROJECT NO.
195092102

SHEET NUMBER
10

APPENDIX D – SITE VISIT PHOTOS

SITE VISIT PHOTOS

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Photo 1: Vegetation West of Canal Road

Photo 2: Vegetation West of Lake Wolford Road

Kimley»Horn

401 B Street, Suite 600
San Diego, CA 92101
Phone: (619) 234-9411

Site Photos

Project:
San Pasqual TO #2

Job No. 195092102

Not to Scale

Photo 3: Vegetation West of N. Lake Wohlford Road

Photo 4: Culvert Opening on East Side of Canal Road

Kimley»Horn	**Site Photos**	
401 B Street, Suite 600 San Diego, CA 92101 Phone: (619) 234-9411	**Project:** **San Pasqual TO #2**	Job No. 195092102 Not to Scale Page 2 of 3

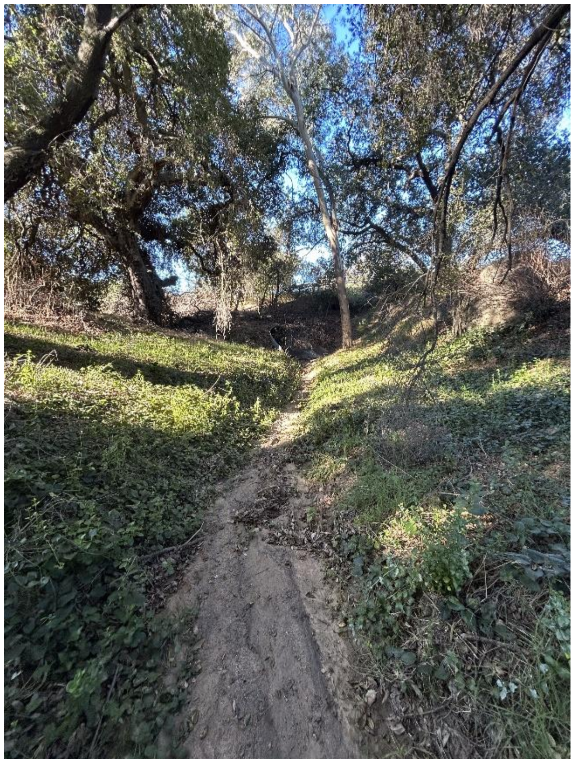

Photo 5: Vegetation Leading to Culvert Opening on East Side of Canal Road

Photo 6: Street Crossing Sign Near Canal Road Culvert

Kimley»Horn

401 B Street, Suite 600
San Diego, CA 92101
Phone: (619) 234-9411

Site Photos

Project:
San Pasqual TO #2

Job No. 195092102	
Not to Scale	

APPENDIX E – EFFECTIVE FIRM PANELS

FIRM PANEL 06073C0828G

FIRM PANEL 06073C0829G

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NOTES TO USERS

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National Geodetic Survey
SSMC-3, #9202
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Silver Spring, Maryland 20910-3282
(301) 713-3242

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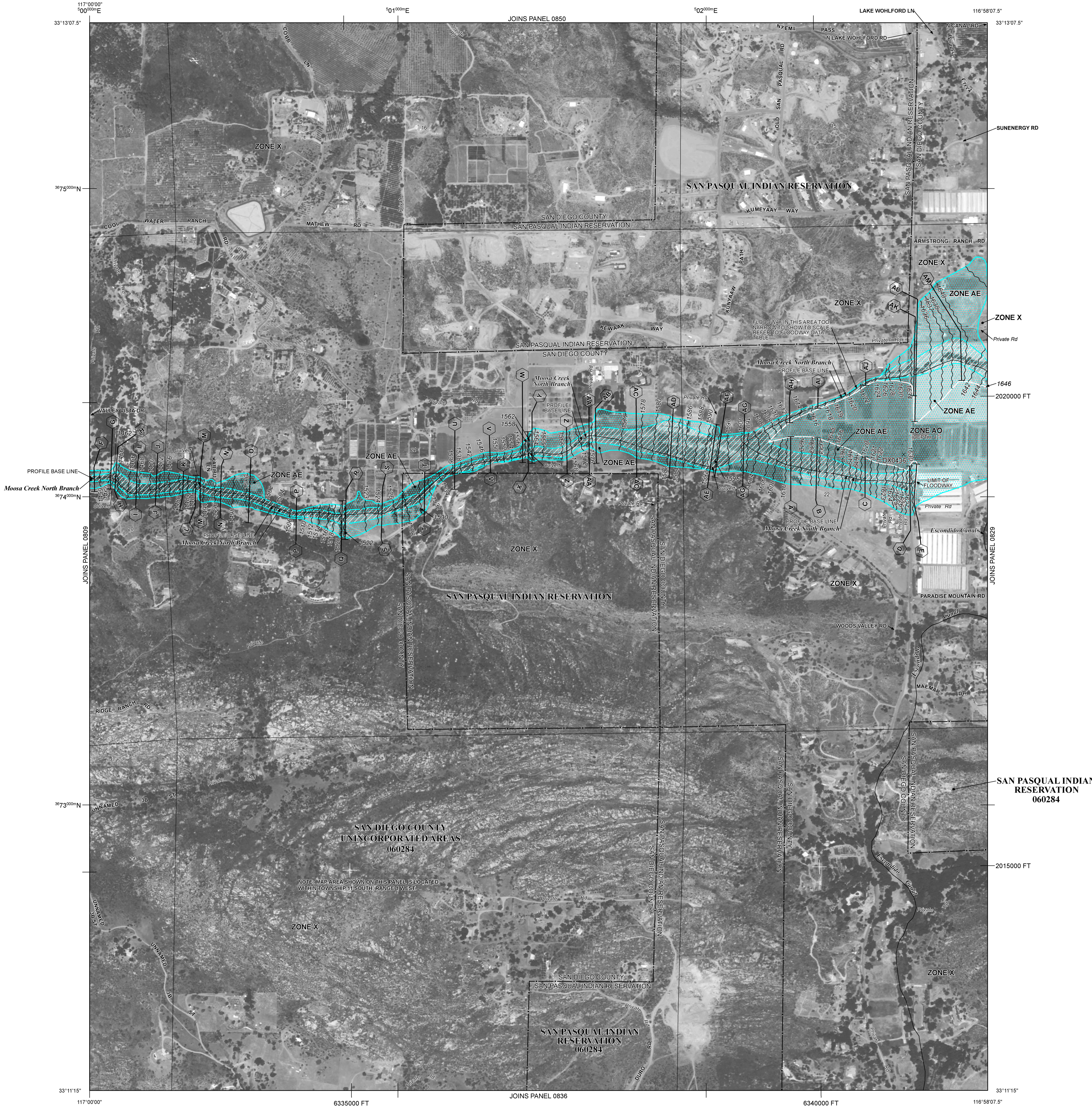

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
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ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
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ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

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OTHER AREAS

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ZONE D	Areas in which flood hazards are undetermined, but possible.

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1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE	1000-meter Universal Transverse Mercator grid ticks, zone 11
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DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

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FLOOD INSURANCE RATE MAP
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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0828G

FIRM
FLOOD INSURANCE RATE MAP
SAN DIEGO COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 828 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO COUNTY	060284	0828	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

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06073C0828G

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

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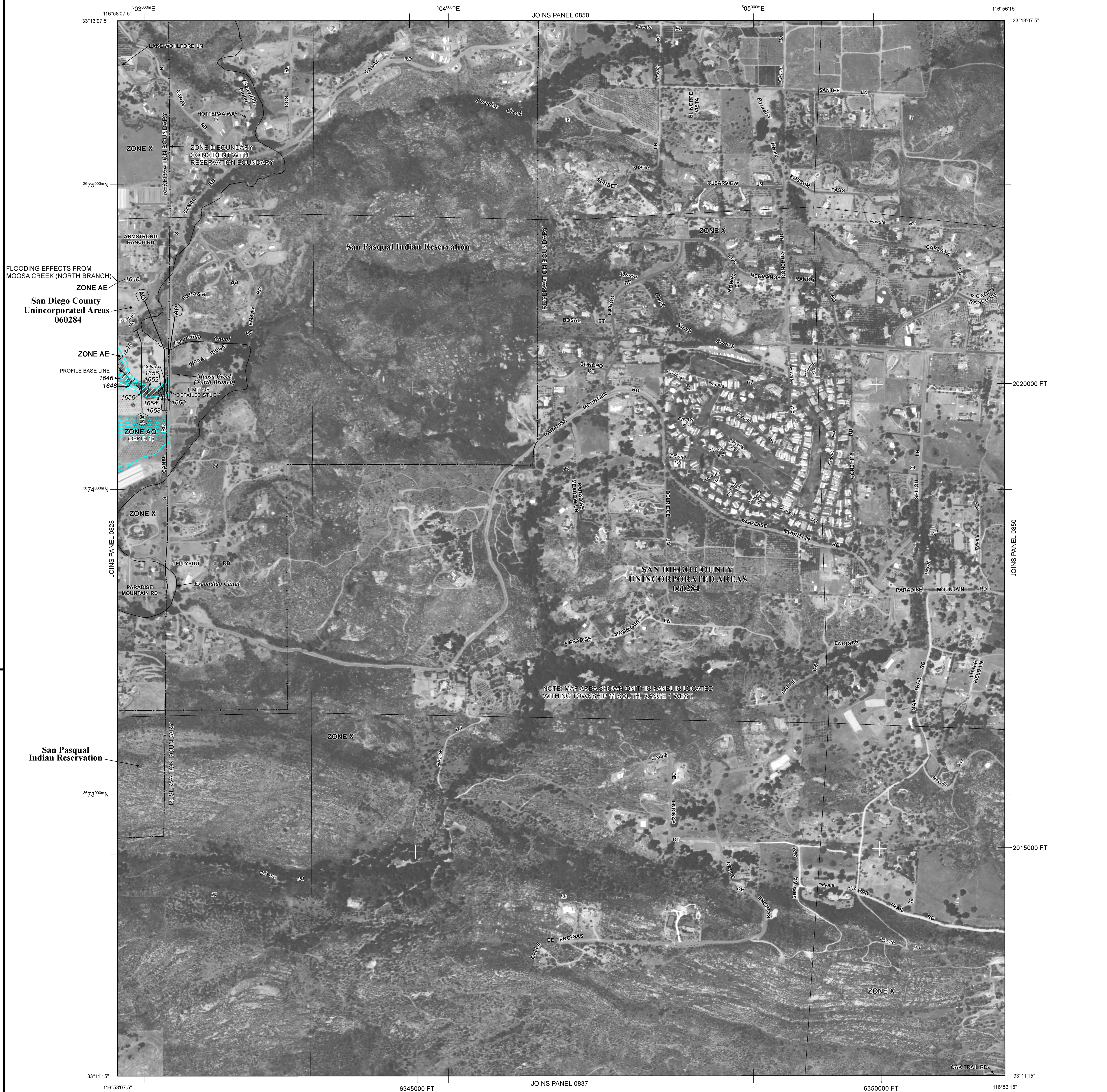

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PANEL 0829G

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PANEL 829 OF 2375

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06073C0829G

MAP REVISED
MAY 16, 2012

Federal Emergency Management Agency

Appendix D – 8 Step Process Impact and Alternative Analysis Study

DEPARTMENT OF HEALTH & HUMAN SERVICES Program Support Center

Rockville, MD 20852

DATE: December 2, 2024

TO: Vincent J. Fusaro, HHS Real Property Official

FROM: CAPT Leo Angelo Gumapas, Program Support Center, Real Estate, Logistics and Operations

SUBJECT: RLO Approval Memo #817 – Construction of a Community Sewer System in a Federal Flood Risk Management Standard Floodplain (FFRMS) and associated 8-Step Decision Making process as required by EO 11988 and EO 14030

ACTION REQUESTED

Request approval for the San Pasqual Band of Mission Indians (the Band) to seek Federal funding assistance from the Department of Health and Human Services - Indian Health Service (DHHS – IHS) to construct new wastewater treatment facilities. The proposed project involves installation of gravity pipelines, lift stations, force mains and a wastewater treatment plant (WWTP). The new facilities will replace existing septic systems through the Band's Reservation that is located entirely within an FFRMS floodplain. The associated 8-Step Process documentation as required in HHS' current floodplain management procedures in General Administrative Manual (GAM) Part 30-40-40, as updated in May 1, 2024 and the Indian Health Service Environmental Review Manual, is attached.

SUMMARY

Executive Order (EO) 13690 published in January of 2015 Established Federal Flood Risk Management Standards. On August 15, 2017, EO 13807 was issued revoking EO 13690. In May of 2021, EO 14030, Climate Financial-Related Risk, reinstated EO 13690 requirements and required Federal Agencies to implement FFRMS. HHS published its final FFRMS procedures on the Federal Register on May 1, 2024.

Per HHS FFRMS procedures, no action involving HHS Real property can occur without HHS Senior Real Property Officer approval.

RECOMMENDATION

Grant approval to construct the above described project located within an FFRMS floodplain as detailed including any and all necessary mitigation measures as referenced. If you have any questions, please contact CAPT Leo Angelo Gumapas at (202) 669-6942.

DECISION

Approved X____________Disapproved_______________Need More Information________________

Vincent J. Fusaro

12/9/2024

Vincent Fusaro, HHS Real Property Official | Date

Attachments:
Tab A: 8-Step Decision Making Process Documentation

APPENDIX A

SAN PASQUAL BAND OF MISSION INDIANS

COMMUNITY SEWER SYSTEM

TASK ORDER #2.4

8-STEP PROCESS

IMPACT ANALYSIS SUMMARY & ALTERNATIVE ANALYSIS SUMMARY

Prepared For:
John Flores
Environmental Director & Domestic Water Manager
San Pasqual Band of Mission Indians
16400 Kumeyaay Way
Valley Center, California 92082

Prepared By:

Kimley-Horn and Associates, Inc.
401 B Street, Suite 600
San Diego, CA 92101

February 2026

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Table of Contents

Tables

1 INTRODUCTION AND SCOPE

1.1 8 STEP PROCESS OVERVIEW

The San Pasqual Band of Mission Indians (The Band) is seeking Federal funding assistance from The Department of Health and Human Services - Indian Health Service (DHHS – IHS) for developing infrastructure on the Reservation, and as a result, the proposed projects must adhere to federal policy directives. The core policy directing federal agencies in floodplain management is Executive Order (EO) 11988 (1977) – Floodplain Management, which aims to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial functions and values served by floodplains by directing agencies to consider alternatives to floodplain construction and outlines procedures to implement the policies and requirements of the Order.

To comply with these policy directives, IHS implements a systematic decision-making process referred to as the 8-Step Process. The 8-Step Process combines floodplain and environmental considerations to assess the impacts of proposed development, notify and involve the public, assess alternatives if the proposed development has the potential to negatively impact the community and environment, and provides guidance on implementing this action. The 8-step process was performed in analyzing the feasibility of the proposed wastewater treatment and conveyance system on the San Pasqual Band of Mission Indians (SPBMI) land. Below is a summary of the 8-step decision making process:

- Step 1. Determine and Identify Floodplains in Proposed Action Area – (100-year floodplain, 500-year floodplain, unmapped and/or wetland). The 0.2-Percent-Annual-Chance method was used for this analysis.
- Step 2. Preliminary Public Notice – A preliminary notice must provide an initial public comment period of at least 10 days. For activities on Trust Land, the Band, and the Bureau of Indian Affairs (BIA) and FEMA will be advised of the proposed action by letter approved by IHS/Band. A preliminary public notice will be published 5 days after Notice to Proceed for the Environmental Assessment. The public notice should be placed in a newspaper of local circulation or posted at appropriate locations in the community.
- Step 3. Identify Practicable Alternatives
- Step 4. Assess effects and identify adverse impacts and beneficial functions and values
- Step 5. Minimize and mitigate adverse impacts
- Step 6. Re-evaluate alternatives
- Step 7. Final Public Notice – The Final Public Notice will be published with the public notice announcing the availability of the EA and Finding of No Significant Impact (FONSI)
- Step 8. Implement Proposed Action and Ensure Post-Implementation Compliance

This report analyzes Step #3, Step #4, Step #5, and Step #6. Step #1 is discussed in the Floodplain Analysis prepared by Kimley-Horn and is summarized in this report. Step #2 and Step #7 are being addressed by the Kimley-Horn Team in a separate task. Step #8 should be completed upon agency approval.

1.2 REPORT LIMITATIONS

This report is subject to the following limitations, as stated within the client-approved scope of work for Task 4 of the San Pasqual Band of Mission Indians Community Sewer System Task Order 2 dated August 25, 2023.

- This report will address Steps #3 and #6 of the 8-step process to identify practicable alternatives and re-evaluate the alternatives.
- This report will address Steps #4 and #5 of the 8-step process by summarizing impacts and mitigation methods identified for the project including impacts pertaining to:
    a. Natural environment (topography, habitat, hazards)
    b. Social concerns (aesthetics, historic and cultural values, land use patterns)
    c. Economic aspects (costs of construction, transportation and relocation)
    d. Legal considerations (deeds, leases)

1.3 PROJECT BACKGROUND

The San Pasqual Band of Mission Indians Reservation is located approximately three miles east of Valley Center, 40 miles north of San Diego, 12 miles northeast of Escondido, and is 25 miles inland from the Pacific Ocean. The Reservation includes three (3) separate, non-contiguous tracts identified as Districts A, B, and C. Each of the districts are labeled in **Figure 1** below.

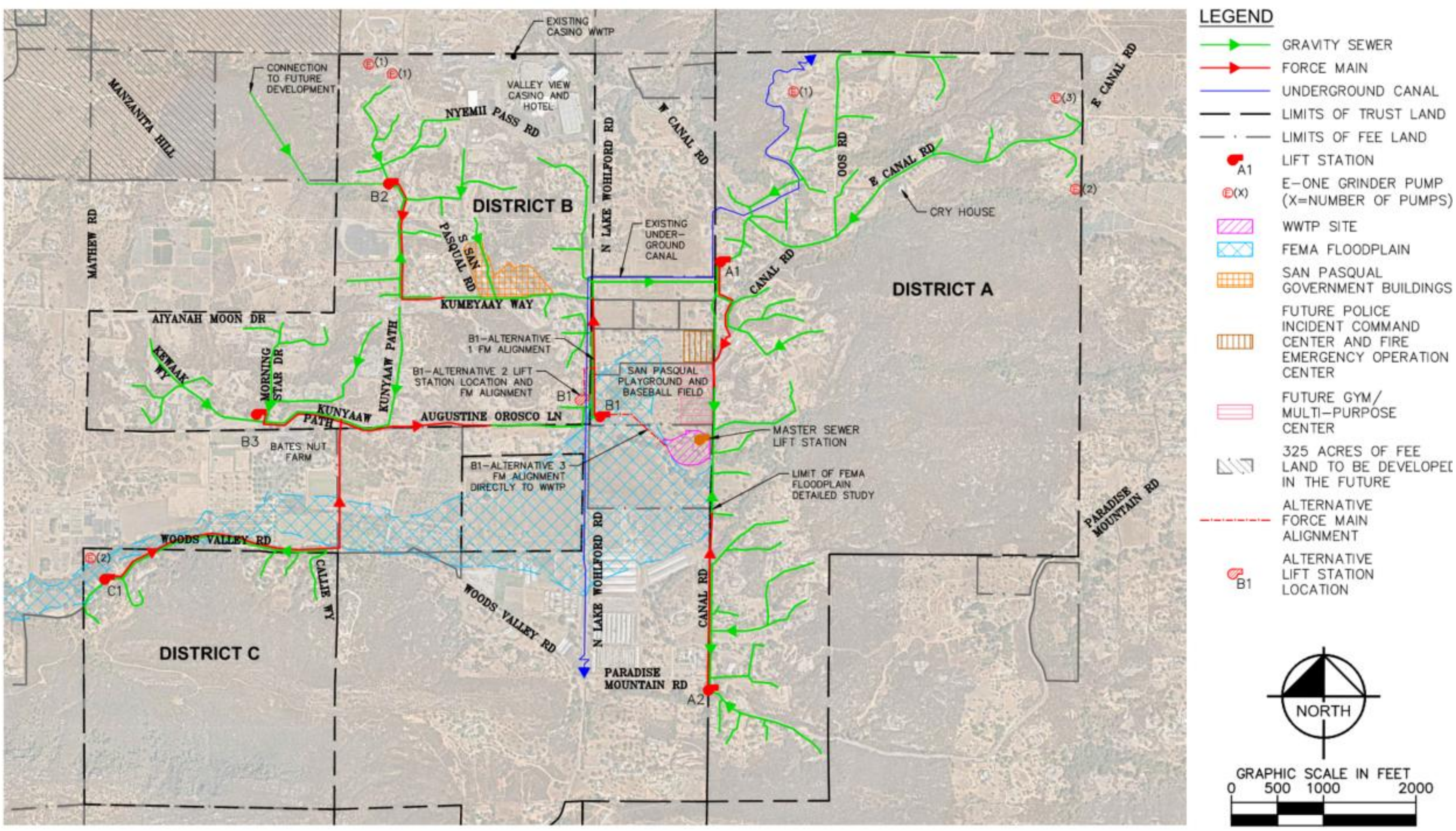

Figure 1: Vicinity Map

The San Pasqual Band of Mission Indians (hereinafter "The Band") intends to construct a Wastewater Treatment Plant (WWTP), a community sewer system consisting of gravity pipe, lift stations, and force mains as well as a network of recycled water storage and conveyance infrastructure. The proposed action area is inclusive of the total areas of Districts A and B, as well as a portion of District C.

2 8 – STEP PROCESS

2.1 STEP #1 DETERMINE AND IDENTIFY FLOODPLAINS IN PROPOSED ACTION AREA

The intent of Step #1 of the 8-step process is to determine and identify floodplains in the proposed action area. This analysis was completed in the Floodplain Analysis report prepared by Kimley-Horn. In summary, this report determined the limits of the delineated floodway using the 0.2-Percent-Annual-Chance method, satisfying EO 13690. As of January 2025, EO 13690 has been rescinded. The analysis herein was completed while EO 13960 was still instated These limits are intended to serve as a planning tool for the Band and, if followed diligently, can be used to aid the IHS 8-step process during future development. No above ground development of any kind (i.e., placement of fill, buildings, structures, etc.) should occur within the floodway. Development within Special Flood Hazard Areas outside of the floodway (i.e., District A or elsewhere) is appropriate from the perspective of flood risk/flood impact provided that:

1) New structures are properly elevated (i.e., above Base Flood Elevations resulting from the "encroachment" modeling scenario), and
2) Project hydrology remains unchanged or is mitigated to pre-project conditions.

The wetlands determination is discussed further in the Environmental Assessment. Generally the project will traverse wetlands primarily as subsurface force main and gravity sewer lines. The wastewater treatment plant site and proposed pump station sites do not currently indicate the presence of wetlands. The wetlands encountered throughout the project area include:

1) Freshwater Forested/Shrub Wetland
2) Freshwater Emergent Wetland
3) Riverine
4) Forested/Shrub Riparian

The proposed project was analyzed using the remapped floodplain created by Kimley-Horn. The following were analyzed:

1) 100-year Floodplain
2) 500-year Floodplain
3) Wetlands

There are multiple components to the proposed project including sewer and recycled water portions of the project. These can be further broken down as indicated below.

Sewer Project Features:

1) Sewer Gravity Pipelines
2) Sewer Force Main Pipelines
3) Sewer Manholes
4) Sewer Lift Stations
5) Wastewater Treatment Plant

Recycled Water Project Features:

1) Recycled Water Pipelines
2) Recycled Water Storage Tank
3) Recycled Water Booster Pump Station

The following table indicates the aforementioned project components that are located within the floodplain:

Table 1 Project Components Within Floodplains

Areas of Concern/ Floodplain Features	Project Components Located in Areas of Concern
100-year Floodplain	Sewer Gravity Mains Sewer Force Mains Lift Stations
500-year Floodplain	Sewer Gravity Mains Sewer Force Mains
Wetlands	Sewer Gravity Mains Sewer Force Mains Recycled Water Pipelines

2.2 STEP #2 PRELIMINARY PUBLIC NOTICE

A preliminary public notice (Step #2) was completed by Kimley-Horn in coordination with The Band and IHS as part of a separate task. A preliminary notice was sent to the County Roads and County Planning Departments, and Fluegge Egg Ranch that is southwest of the WWTP via email on April 22nd, 2024, and via hardcopy on May 1st, 2024. Additionally, the Band posted the notice at Tribal buildings and on their website. IHS took responsibility for sending the notice to the BIA and FEMA.

2.3 STEP #3 IDENTIFY PRACTICABLE ALTERNATIVES

Step #3 of the 8-step process is to identify practicable alternatives. This step of the process includes identification and evaluation of two alternatives, including, when possible, alternative sites outside the floodplain or wetland, alternative actions, and the “no action” option.

The project components in this analysis are described in Section 2.1.

Practicable Alternatives to the project include:

1) No Action
2) Construction of Project Features within Floodplain with Mitigative Measures and Alternative Locations for Project Features Located in Regulatory Floodway

These practicable alternatives are explored in further detail below:

1) No Action
    a. The no action alternative is considered the least practicable alternative. Should this alternative be chosen, no action would be performed in the construction of converting the existing septic sewer systems to a community sewer system. This is not considered beneficial to the Band, as the intent of the project is to construct a community sewer system.

2) Construction of Project Features within Floodplain with Mitigative Measures and Alternative Locations for Project Features Located in Regulatory Floodway
    a. Elevate critical components and electrical equipment above the design flood elevation
        i. This alternative should be considered for lift stations that are located in the 100-year floodplain.
    b. Protect or divert floodwater and surge using green infrastructure
        i. This alternative should be considered for lift stations that are located in the 100-year floodplain.
    c. Floodproof
        i. This alternative should be considered for lift stations that are located in the 100-year floodplain.
    d. Provide backup power systems
        i. This alternative should be considered for lift stations that are located in the 100-year floodplain.
    e. Alternative Locations
        i. This alternative should be considered for lift stations and other structures that are indicated to be located in the regulatory floodplain based on the original locations identified in the Feasibility Study dated August 2023. Based on the Feasibility study, the following lift stations should be considered to be relocated based on the location of the regulatory floodway: Lift Station B1 and Lift Station A2.

2.4 STEP #4 ASSESS AND IDENTIFY ADVERSE IMPACTS AND BENEFICIAL FUNCTIONS AND VALUES

Step #4 of the 8-step process assesses and identifies adverse impacts and beneficial functions and values. The adverse impacts would include the potential effects and incompatible development of any actions in a floodplain. This step includes analyzing the direct and indirect support of other floodplain and wetland development that might result from the project. The following factors are analyzed in this step:

(1) Natural environment (topography, habitat, hazards);
(2) Social concerns (aesthetics, historic and cultural values, land use patterns);
(3) Economic aspects (costs of construction, transportation and relocation); and
(4) Legal considerations (deeds, leases).

The project components in this analysis are described in Section 2.1.

Practicable Alternatives are discussed in detail in Section 2.3 and are summarized below:

1) No Action
2) Construction of Project Features within Floodplain with Mitigative Measures and Alternative Locations for Project Features Located in Regulatory Floodway

Table 2 and Table 3 explore in detail the adverse impacts and beneficial functions and values of each alternative.

Table 2 Adverse Impacts and Beneficial Functions of No Action Alternative

Practicable Alternative	Factor	Adverse Impacts	Beneficial Functions and Values
No Action (Alternative 1)	Natural Environment	Topography- N/A	There is no beneficial function to the no action alternative
		Habitat- N/A	
		Hazards- Hazards of the No Action alternative include the potential for failed septic systems to negatively impact the surrounding environment.	
	Social Concerns	Aesthetics- N/A	There is no beneficial function to the no action alternative
		Historic and Cultural Values- N/A	
		Land Use Patterns- The no action alternative has an adverse impact amongst members of the Band, as there has been interest expressed by Band members to develop the land currently occupied by septic systems	
	Economic Aspects	Costs of Construction- The no action alternative will ultimately result in the need for the abandonment and replacement of the existing septic systems, as they are nearing the end of their useful lifespan	There is no beneficial function to the no action alternative
		Transportation and Relocation- This alternative could result in the potential relocation of residents who desire to develop on land where space constraints do not warrant the installation of septic systems	
	Legal Considerations	Deeds-N/A	N/A
		Leases-N/A	

Table 3 Adverse Impacts and Beneficial Functions of Alternative Locations for Project Features in Areas of Concern Alternative

Practicable Alternative	Factor	Adverse Impacts	Beneficial Functions and Values
Construction of Project Features within Floodplain with Mitigative Measures and Alternative Locations for Project Features Located in Regulatory Floodway (Alternative 2)	Natural Environment	Topography- Minimal topographic changes expected for the installation of linear project features of pipelines, topographic surface expected to be reinstated to original surface; Topographic changes for the Wastewater Treatment Plant could include mitigation efforts to address any localized flooding. The alternative locations for Lift Stations B1 and A2 could result in the need for surface changes, which may be required to achieve the depths needed for sewer gravity flows	The removal of septic systems, reduces risks to the surrounding environment in case of failures
		Habitat- The habitat of the new locations for Lift Station B1 and A2 could result in negative impacts, which would need to be further analyzed once new locations are chosen for these lift stations	
		Hazards- N/A	
	Social Concerns	Aesthetics- Locations of Lift Stations may not be desirable to the residents of the Reservation	Eliminates the need for resident-maintained septic systems on individual properties, creating a more reliable method of eliminating sewer waste as well as the potential for development of land that would have previously been reserved for septic systems
		Historic and Cultural Values- Construction of the community sewer system and recycled water system may impact historic and cultural resources identified in the HPI prepared by Kimley Horn and submitted to the Band	
		Land Use Patterns- N/A	
	Economic Aspects	Costs of Construction- The Band expects to receive funding to construct the proposed community sewer system, however unforeseen cost impacts could occur as a result of the commencement of this project	Eliminates the need and costs associated with resident-maintained septic systems on individual properties, allowing residents to rely on the community sewer system
		Transportation and Relocation- Temporary transportation impacts would be experienced during the construction of the community wastewater system where features are proposed within the existing roadway	
	Legal Considerations	Deeds-N/A	N/A
		Leases-N/A	

2.5 STEP #5 MINIMIZE AND MITIGATE ADVERSE IMPACTS

Step #5 of the 8-step process addresses minimization and mitigation measures to resolve adverse impacts. The adverse impacts would include the potential effects and incompatible development of any actions in a floodplain. This step of the process is to minimize impacts identified and restore and preserve the beneficial functions and values served by floodplains and wetlands.

As previously discussed, the following alternatives for the community wastewater system construction would minimize and mitigate adverse impacts to the floodplain:

1) Construction of Project Features within Floodplain with Mitigative Measures and Alternative Locations for Project Features Located in Regulatory Floodway
    a. Elevate critical components and electrical equipment above the design flood elevation
    b. Protect or divert floodwater and surge using green infrastructure
    c. Floodproof
        i. This includes use of temporary flood barriers for lift stations that are at risk for only minor flooding, installing permanent barriers such as flood walls, berms, levees, or sealed doors for the most at-risk stations, installing fully submersible pumps in lift stations, installing electrical components, controls and circuitry in water-resistant cabinets in lift stations, installing backflow prevention devices such as valves on lines that flow into the lift station and emergency overflow lines, and installing water-tight manhole covers and vault access hatches in flood-prone areas to limit inflow into the gravity sewer system.
    d. Provide backup power systems
        i. This includes considering the following: installing standby generators to power critical equipment in a lift station, installing quick-connects on equipment to attach to portable generators, using generators that run on more than one type of fuel and installing renewable energy supplies with a battery system.
    e. Alternative Locations for Project Features in Areas of Concern
        i. This alternative should be considered for lift stations that are indicated to be located in the floodway based on the original locations identified in the Feasibility Study dated August 2023. Based on the Feasibility study, the following lift stations should be considered to be relocated based on the floodway: Lift Station B1 and Lift Station A2.

2.6 STEP #6 RE-EVALUATE ALTERNATIVES

Step #6 of the 8-step process discusses the re-evaluation of the alternatives. This step is conducted in light of the information gained to determine if the proposed action is still practicable. In this step, if new construction is to be located in a floodplain or wetland, indicate where floodproofing and other measures should be implemented. Where practicable, structures should be elevated above the flood level.

As identified in Step #5 of the 8-step process, Alternative 2 would implement acceptable mitigation measures for constructing the Proposed Project with minimal impacts to the floodplain and is therefore recommended for implementation. Mitigation measures are listed in more detail in Step #5.

2.7 STEP #7 FINAL PUBLIC NOTICE

A final public notice (Step #7) is being completed by Kimley-Horn in coordination with The Band and IHS as part of a separate task.

2.8 STEP #8 IMPLEMENT PROPOSED ACTION AND ENSURE POST-IMPLEMENTATION COMPLIANCE

Step 8 will be completed after the EA document review period and development and signature of the FONSI by the IHS California Area Director.

PUBLIC WORKS
5510 OVERLAND AVENUE, SUITE 410, SAN DIEGO, CALIFORNIA 92123-1237
(858) 694-2212

WILLIAM P. MORGAN, P.E.
INTERIM DIRECTOR

June 10, 2022

Indian Health Service
Attention: Julia Majkrzak, P.E., Field Engineer
1320 W Valley Parkway, Suite 309
Escondido, CA 92029

RE: Preliminary Notice: San Pasqual Band of Mission Indians Community Sewer Conversion Public Comment from County of San Diego

The County of San Diego has the following comments on the sewer conversion project regarding impacts to wastewater and drainage.

WASTEWATER

Wastewater infrastructure is proposed in the floodplain and floodway.

- Flooding concerns: Wastewater infrastructure (including but not limited to wastewater treatment plant, gravity pipelines, lift stations, and force mains) should be designed to minimize overlap with known floodplains and floodways. Where overlap cannot be avoided, design of wastewater facilities should incorporate elements to prevent unwanted comingling of stormwater and wastewater flows. This may include design elements such as walls, levees, raised foundations, hazardous waste containment tanks, pressure seals, redundancies, etc.
- Erosion concerns: Wastewater infrastructure (including but not limited to wastewater treatment plant, gravity pipelines, lift stations, and force mains) should be designed to minimize overlap with known floodplains and floodways. Where overlap cannot be avoided, design of wastewater facilities should incorporate elements to ensure erosive forces within the floodplain and floodway do not compromise, expose, or damage wastewater infrastructure. This may include design elements such as walls, levees, rip rap, concrete encased pipe, articulated concrete block, etc.

DRAINAGE

- Several of the parcels listed are adjacent to the right of way of county maintained roads. Plans should be submitted to DPW for review of any work within the county right of way, or any work that that could impact the county right of way or any county roadway drainage facilities.

Sincerely,

Sue Waters

Sue Waters
Land Use Environmental Planning Manager
County of San Diego Department of Public Works

Cc: Edwin Andrus, County of San Diego, Dept. Planning and Land Use
Julia Majkrzak – Julia.Majkrzak@IHS.gov

Appendix E – Biological Technical Study

BIOLOGICAL SURVEY REPORT
FOR THE
SAN PASQUAL COMMUNITY SEWER PROJECT
IHS PROJECT NO. CA 17-E61
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:

SAN PASQUAL BAND OF MISSION INDIANS (SPBMI)

AND

INDIAN HEALTH SERVICE (IHS)

Prepared by:

CHAMBERS GROUP, INC.
3151 Airway Avenue, Suite F208
Costa Mesa, CA 92626
(949) 261-5414

January 2026

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SECTION 1.0 – SUMMARY

This Biological Survey Report has been completed by Chambers Group, Inc. (Chambers Group) to determine the potential for effects to biological resources and jurisdictional waters associated with construction of the proposed San Pasqual Community Sewer Project (Project or proposed Project). The Project area consists of 11,700 linear feet (LF) of sewer force main lines, 57,200 LF of gravity sewer lines, 8.5-acres of treatment plant and lift station facilities, and 11,800 LF of recycled water pipes. The Action Area for the proposed Project encompasses approximately 170 acres of the San Pasqual Band of Mission Indians (SPBMI) Reservation in San Diego County, California. The Action Area includes a 50-foot (ft) buffer around treatment plant facilities and a 50-ft corridor along sewer and water pipes. The Survey Area analyzed in this Biological Survey Report includes a 100-ft buffer around the Action Area, plus six proposed Staging Areas, covering a total of approximately 582 acres (Figure 1: Project Location and Vicinity Map).

Chambers Group biologists Paul Morrissey, Laurie Gorman, Erik Olmos, Matt Speegle, Linnea Howard, and Jessica Calvillo conducted a biological reconnaissance survey and jurisdictional delineation within the Survey Area to document existing biological conditions of the site, identify potentially jurisdictional waters, and determine the potential for occurrence (PFO) of special status species. Figure 1: Project Location and Vicinity Map depicts the Survey Area covered during the biological reconnaissance survey and jurisdictional delineation. The survey was conducted on foot throughout the Survey Area on February 22, February 27, and March 6, 2024; and September 10, 2025. All plant and wildlife species and vegetation communities observed within the Survey Area were recorded. In addition, Chambers Group biologists Laurie Gorman (permitted to survey for coastal California gnatcatcher [*Polioptila californica californica*]), Linnea Howard, and Matt Speegle conducted protocol-level focused surveys during the 2025 breeding season for coastal California gnatcatcher from May 14 through June 27, 2025, and least Bell's vireo (*Vireo bellii pusillus*) from May 6 through July 18, 2025, to determine presence or absence of each species.

Results from the biological studies documented 22 vegetation community and land cover types including developed, bare ground, ornamental landscaping, and ruderal areas; as well as native rocky outcrops, chaparral, scrub, woodland, and marsh communities within the Survey Area. Potential jurisdictional water features were observed throughout the Survey Area. The boundaries of each hydrological feature were mapped and distinguished by the respective Agencies' jurisdiction, based on current Agency guidance documents. No federally sensitive species were detected during the surveys; however, the following federally listed endangered or threatened species were determined to have a PFO: arroyo toad (*Anaxyrus californicus*), Nevin's barberry (*Berberis nevinii*), San Diego ambrosia (*Ambrosia pumila*), San Diego thorn-mint (*Acanthomintha ilicifolia*), and thread-leaved brodiaea (*Brodiaea filifolia*). Focused surveys conducted for coastal California gnatcatcher and least Bell's vireo were negative; therefore, both of these species can be considered absent.

The IHS completed informal consultation with the United States Fish and Wildlife Service (USFWS) to discuss requirements under Section 7 of the Endangered Species Act (ESA) of 1973, as amended. The USFWS requested that focused surveys be conducted for coastal California gnatcatcher and least Bell's vireo; as mentioned above, these surveys were completed during the 2025 breeding season and were negative. The IHS subsequently made a No Effect determination and notified the USFWS of their determination.

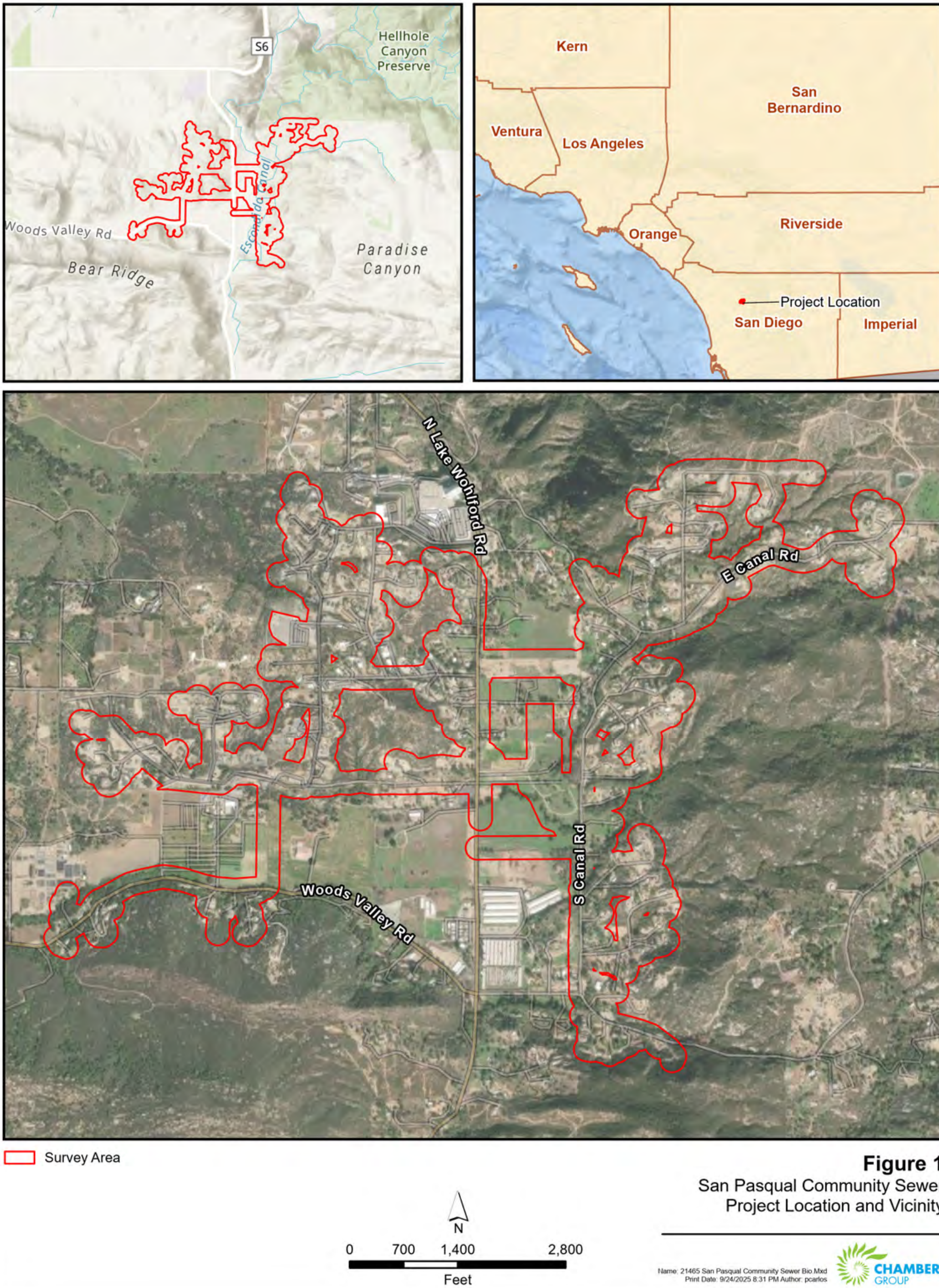


Figure 1
San Pasqual Community Sewer
Project Location and Vicinity

Name: 21465 San Pasqual Community Sewer Bio.Mxd
Print Date: 9/24/2025 8:31 PM Author: pcarlos

CHAMBERS GROUP

SECTION 2.0 – INTRODUCTION

Chambers Group, Inc. (Chambers Group) was retained by Kimley-Horn to conduct a literature review, biological reconnaissance survey, and jurisdictional waters delineation for the proposed Project. The purpose of these studies was to identify vegetation communities, document habitats and soil types that could support special status species, determine the PFO of special status species, and record existing plant and animal species observed or detected at the Project site. Information contained in this document has been prepared in accordance with accepted scientific and technical standards that are consistent with the requirements of the USFWS. The jurisdictional waters delineation was conducted to support the United States Army Corps of Engineers (USACE) 404 permit application for construction activities within the Project Site.

2.1 PROJECT OVERVIEW

The San Pasqual Band of Mission Indians (SPBMI) is proposing to construct a wastewater collection system and treatment facility. The proposed action involves a community sewer system consisting of gravity pipeline, lift stations, force mains, a Wastewater Treatment Plant (WWTP) and associated facilities to treat the sewage generated on the Reservation. The proposed Project also includes a recycled water distribution network for use throughout the Reservation. The proposed action consists of 12,840 LF of sewer lines, 64,400 LF of gravity sewer lines, 8.5-acre site for treatment plant facilities, and 5,500 LF of recycled water pipes.

2.2 PROJECT LOCATION

The proposed Project encompasses approximately 170 acres of the SPBMI Reservation, which is approximately three miles east of the community of Valley Center in San Diego County, California (Figure 1: Project Location and Vicinity Map). The elevation on the Project site ranges from approximately 1,524 feet to 1,931 feet above mean sea level (amsl). The Project site is located in Township 11 South, Range 1 West, Sections 14, 15, 16, 21, 22, and 23 in the Rodriguez Mountain U.S. Geological Survey (USGS) 7.5-minute quadrangle (USGS 1992).

The Project site meanders through low-density residential development, with pockets of open space and agricultural land throughout the alignment. The Project site is surrounded by developed and agricultural land to the north, northwest, west, and along N. Lake Wohlford Rd. to the south. Land northeast of the Project consists of undeveloped open space connecting to the Hellhole Canyon County Preserve approximately one mile away. Land east of the Project is dominated by approximately 400-acres of undeveloped open space until it transitions into housing developments. Open space is also present southwest of the Project site which connects to Lake Wohlford Park.

SECTION 3.0 – APPLICABLE REGULATIONS

The following federal regulations and policies pertain to biological resources and are relevant to the Proposed Project.

3.1 FEDERAL

The following are federal policies that apply to the proposed Project.

3.1.1 Clean Water Act

The purpose of the Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of fill material into waters of the U.S. without a permit from the USACE. The definition of waters of the U.S. includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or groundwater 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" (Code of Federal Regulations [CFR] Title 33, Section 328.3[b]). The goals and standards of the CWA are enforced through permit provisions. The U.S. Environmental Protection Agency (EPA) also has authority over wetlands and may override a USACE permit.

The proposed Project is unlikely to qualify for an exemption to Section 404 permit requirements. Substantial impacts to wetlands may require an Individual Permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing Nationwide Permits.

3.1.2 Clean Water Rule

On September 12, 2019, the EPA and Department of the Army signed a final rule to repeal the 2015 Clean Water Rule (2015 Rule) and re-codify the regulatory text defining "waters of the United States" that existed prior to the 2015 Rule. The new regulations went into effect on December 23, 2019. One of the proposed changes includes ephemeral features that contain water only during or in response to rainfall would no longer be considered "waters of the United States" under the jurisdiction of the USACE. On August 28, 2019, the Office of Administrative Law approved the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to "waters of the State". The procedures went into effect on May 28, 2020. Under these new regulations, the State Water Resources Control Board and its nine Regional Water Quality Control Boards (RWQCBs) will assert jurisdiction over all existing "waters of the United States", and all waters that would have been considered "waters of the United States" under the 2015 Rule. Thus, the "waters of the United States" that would no longer be under USACE jurisdiction would be under RWQCB jurisdiction.

The EPA and USACE are in receipt of the U.S. District Court for the District of Arizona's August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. On October 22, 2019, the EPA and USACE published a final rule to repeal the 2015 Clean Water Rule: Definition of "Waters of the United States" ("2015 Rule"), which amended portions of the CFR, and to restore the regulatory text that existed prior to the 2015 Rule.

The final "Revised Definition of 'Waters of the United States'" rule (the "2023 Rule") became effective on March 20, 2023. On August 29, 2023, the U.S. EPA and USACE issued a final rule to amend the "2023 Rule" to conform with the U.S. Supreme Court's May 25, 2023, decision in the case of Sackett v Environmental Protection Agency (parts of the January 2023 Rule are invalid under the Supreme Court's interpretation of the Clean Water Act in the Sackett decision). Therefore, this jurisdictional delineation is consistent with the 2023 Rule and August 29 amendment and includes measurement of the Ordinary High Water Mark (OHWM) to determine Waters of the United States (WoUS).

3.1.3 Federal Endangered Species Act, Section 7

Section 7 of the Federal Endangered Species Act (ESA), or Interagency Cooperation, is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Under the ESA, all Federal agencies shall aid in the conservation of listed (threatened or endangered) species (§ 7(a)(1)). Furthermore, federal agencies must ensure that "any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat" (§ 7(a)(2)). When a project that is federally authorized, funded, or carried out may affect a listed species or designated critical habitat, a Section 7 consultation is required to ensure that its action is not likely to jeopardize the continued existence of a listed species and/or result in the destruction or adverse modification of critical habitat.

3.1.4 Migratory Bird Treaty Act, as Amended

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703-711), provides legal protection for almost all bird species occurring in, migrating through, or spending a portion of their life cycle in North America by restricting the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. USFWS determined it was illegal under the MBTA to directly kill or destroy an active nest (nest with eggs or nestlings) of, nearly any bird species (with the exception of non-native species through the MBTA Reform Act of 2004). Certain game bird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the MBTA is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities:

- Falconry
- Raptor propagation
- Scientific collecting
- Special purposes, such as rehabilitation, education, migratory game bird propagation, and salvage
- Take of depredating birds, taxidermy, and waterfowl sale and disposal

The regulations governing migratory bird permits can be found in Title 50, Part 13 (General Permit Procedures) and Part 21 (Migratory Bird Permits) of the CFR.

SECTION 4.0 – METHODOLOGY

4.1 LITERATURE REVIEW

Before conducting the field survey, soil maps for San Diego County were referenced online to determine the types of soil found within the Survey Area. Soils were determined in accordance with categories set forth by the United States Department of Agriculture (USDA) Soil Conservation Service and by referencing the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2024).

For the purpose of determining hydrologic connectivity to a Traditional Navigable Waters (TNW), the most recent records of the USFWS National Wetlands Inventory (NWI; USFWS 2024a) data, USGS National Hydrography Dataset (NHD) blue-lined drainages (USGS 2024), Google Earth aerial imagery (Google LLC 2024), and USGS topographic and aerial maps (USGS 1992 and 2022) were reviewed; and all features were inspected in the field on- and off-site for true connectivity.

In order to evaluate the Survey Area for the PFO of sensitive species and habitats, the California Natural Diversity Database (CNDDB) managed by CDFW (CDFW 2024), the USFWS sensitive species database (USFWS 2024b), the USFWS Critical Habitat Mapper (USFWS 2024c), the California Native Plant Society's Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California (CNPS 2024), and iNaturalist (iNaturalist 2024) were reviewed for records of occurrence within a 5-mile radius and for the following California USGS 7.5-minute quadrangles containing and surrounding the Project: *Rodriguez Mountain, Pala, Boucher Hill, Palomar Observatory, Valley Center, Mesa Grande, Escondido, San Pasqual,* and *Ramona,* California (CDFW 2024). These databases contain records of reported occurrences of special status species and habitats including federal- or state-listed endangered or threatened species. As the Project is proposed on tribal lands and funded by Federal agencies and the SPBMI, only federally sensitive species are analyzed in this report. In addition, the USFWS's Information for Planning and Conservation (IPaC) site was searched for federally sensitive species known to occur in the vicinity of the Survey Area and critical habitat that may overlap with the Survey Area (USFWS 2024d).

4.2 JURISDICTIONAL WATERS

Chambers Group biologists Paul Morrissey, Laurie Gorman, Erik Olmos, Matt Speegle, Linnea Howard, and Jessica Calvillo conducted a jurisdictional delineation of waters regulated by the USACE within the Survey Area on February 22, February 27, and March 6, 2024. Potential USACE jurisdictional areas identified during the literature search and aerial image analysis were field checked for the presence of definable channels, soils, wetland vegetation, riparian habitat, and hydrology. Each drainage was examined in the field, and the channel banks were examined for signs of flow, terraces, drift deposits and other indicators that would determine the location of the OHWM. Climate and flow frequency were considered during the survey effort. Data were collected electronically with ArcGIS Field Maps (smart phone application) and hand-written onto OHWM data sheets (provided in Appendix F). Areas of potential jurisdiction were mapped to calculate acreage of impacts.

Potential wetlands were evaluated using the methodology set forth in the *1987 Corps of Engineers Wetlands Delineation Manual* (1987 Wetland Manual; USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (version 2.0)* (2008 Arid West Supplement; USACE 2008). The methods set forth in the 1987 Wetland Manual and the 2008 Arid West Supplement involve the delineation of wetlands based on the presence of three wetland parameters: a predominance of hydrophytic vegetation, wetland hydrology, and hydric soils. These wetland parameters are discussed in greater detail below.

4.2.1 Hydrophytic Vegetation

Hydrophytic vegetation is defined as "the sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content" (USACE 1987). The potential wetland areas were surveyed by walking through the Survey Area and making observations of areas exhibiting characteristics of jurisdictional wetlands.

Areas supporting plant life potentially indicative of wetlands were evaluated in the field according to current USACE wetland delineation procedures described in the 1987 Wetland Manual (USACE 1987) and the 2008 Arid West Supplement (USACE 2008). The dominant and subdominant plant species present in the sample pits of these potential wetland areas were identified and their wetland indicator status noted based on the current National Wetland Plant List (USACE 2023). The list was referenced to classify identified plants using the following categories: obligate wetland (OBL; almost always occurs in wetlands), facultative wetland (FACW; usually occurs in wetlands but occasionally found in non-wetlands), facultative (FAC; equally likely to occur in wetlands and non-wetlands), facultative upland (FACU; usually occurs in non-wetlands but occasionally found in wetlands), and obligate upland (UPL; almost always occurs in non-wetlands).

Plant species and absolute cover values would be recorded by stratum (i.e., tree, sapling/shrub, herb, woody vine) and evaluated for dominance and prevalence according to guidelines in the *1987 Wetland Manual* and *2008 Arid West Supplement guidelines* (USACE 1987, and 2008). Plant species naming conventions follow the *Jepson Manual, Second Edition* (Baldwin et al. 2012). Vegetation communities follow the naming convention in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009).

4.2.2 Hydric Soils

A hydric soil is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (USACE 1987). Hydric soil indicators are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds (USACE 2008) due to periods of anaerobic conditions in the soil. The hydric soil criterion is considered satisfied at a location if soils in the area can be inferred to have a high groundwater table, show evidence of prolonged soil saturation, or contain indicators suggesting a long-term reducing environment in the upper 18 inches of the soil profile are present.

Potential hydric soils were investigated within the Survey Area. Sample soil pit locations were selected, and a hole was dug to a typical depth of 18 inches (unless prevented by some occluding material) or occasionally deeper to determine soil color, evidence of soil saturation, depth to shallow groundwater, and indicators of a reducing soil environment (e.g., redox concentrations or pore linings, gleyed soils, hydrogen sulfide odor). Soil matrix colors were classified using Munsell Soil-Color Charts (Munsell Color 2009). Wetland delineation datasheets are provided in Appendix G.

4.2.3 <u>Wetland Hydrology</u>

The presence of wetland hydrology indicators confirm that inundation or saturation has occurred on a site but may not provide information about the timing, duration, or frequency of the event. Hydrology features are generally the most ephemeral of the three wetland parameters (USACE 2008).

Hydrologic information for the Survey Area was obtained by reviewing USFWS NWI (USFWS 2024a) data, USGS NHD blue-lined drainages (USGS 2024), USGS topographic maps (USGS 1992) and aerial imagery (Google LLC 2024) and by directly observing hydrology indicators in the field. The wetland hydrology criterion is considered satisfied at a location if, based upon the conclusions inferred from the field observations, an area has a high probability of being periodically inundated or has soils saturated to the surface at some time during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE 1987). If at least one primary indicator or at least two secondary indicators are found at a sample pit, the wetland hydrology criterion is considered satisfied.

4.3 BIOLOGICAL RESOURCES

Chambers Group biologists Laurie Gorman, Erik Olmos, Matt Speegle, Linnea Howard, and Jessica Calvillo conducted a biological reconnaissance survey within the approximately 582-acre Survey Area to identify the PFO of special status species, vegetation communities, or habitats that could support special status species. The survey was conducted on foot throughout the Survey Area between 0815 and 1630 on February 22, February 27, and March 6, 2024; and September 10, 2025. Weather conditions during the three survey days included temperatures ranging from 51 to 63 degrees Fahrenheit, 5 percent to 100 percent cloud cover, a brief (approximately 10-minute) period of light precipitation, and wind speeds ranging from 1 to 8 miles per hour. Photographs of the Survey Area were taken to document existing conditions (Appendix A).

4.3.1 <u>Vegetation</u>

Vegetation communities within the Survey Area were identified, qualitatively described, and mapped onto high-resolution imagery aerial photographs. The acreage of impacts to vegetation communities were calculated within Survey Area. Vegetation communities were determined in accordance with the *Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Plant nomenclature follows that of *The Jepson Manual, Second Edition* (Baldwin et al. 2012). All plant species observed within the Survey Area were recorded. A comprehensive list of the plant species observed during the survey is provided in Appendix B.

4.3.2 <u>Wildlife</u>

All wildlife and wildlife signs observed and detected, including tracks, scat, carcasses, burrows, excavations, and vocalizations, were recorded. Additional survey time was spent in those habitats most likely to be utilized by wildlife (i.e., native vegetation, wildlife trails, etc.) or in habitats with the potential to support federal-listed or otherwise special status species. Notes were made on the general habitat types, species observed, and the conditions of the Survey Area. A comprehensive list of the wildlife species detected during the survey is provided in Appendix C.

In addition to the biological reconnaissance survey, Chambers Group biologists Laurie Gorman (permitted to survey for coastal California gnatcatcher), Linnea Howard, and Matt Speegle conducted protocol-level focused surveys during the 2025 breeding season for coastal California gnatcatcher from May 14 through June 27, 2025, and least Bell's vireo from May 6 through July 18, 2025, to determine presence or absence of each species. The surveys were negative, and these species are therefore considered absent from the Survey Area; these results are incorporated into Section 5.6.2 of this report. The focused coastal California survey report is provided in Appendix H, and the focused least Bell's vireo survey report is provided in Appendix I.

SECTION 5.0 – RESULTS

5.1 SOILS

After review of the USDA Soil Conservation Service database and by referencing the USDA NRCS Web Soil Survey (USDA 2024), it was determined that the Survey Area is located within the San Diego County Area CA638. Based on the results of the database search, 10 soil types are known to occur in the Survey Area (Figure 2: USDA Soils Map), as described below (USDA 2024).

Bonsall sandy loam, 2 to 9 percent slopes, eroded, occurs in a small portion of the northeast corner of the Survey Area. They are moderately well drained soils found in convex positions at 200 to 2,500 feet above mean sea level (amsl). The soil profiles are composed of sandy loam, clay, and sandy clay loam derived from weathered granite. These soils are not hydric and typically have very low to moderately low permeability, resulting in very high runoff. The soil is more than 80 inches to bedrock.

Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded, occurs throughout the northwest portion of the Survey Area. They are somewhat excessively drained soils found in convex positions at 300 to 4,000 feet amsl. The soil profiles are composed of coarse sandy loam, sandy loam, sandy clay loam, and weathered bedrock derived from granite and granodiorite. These soils are not hydric and typically have moderately high to high permeability, with medium to high runoff. The soil is 4 to 40 inches to bedrock.

Fallbrook sandy loam, 5 to 9 percent slopes, eroded, occurs on slopes throughout the Survey Area. They are well drained soils found in convex positions at 200 to 3,500 feet amsl. The soil profiles are composed of sandy loam, loam, sandy clay loam, and weathered bedrock derived from granodiorite. These soils are not hydric and typically have moderately high permeability, with high runoff. The soil is 40 to 60 inches to bedrock.

Fallbrook sandy loam, 9 to 15 percent slopes, eroded, occurs in just two small sections on the north and south edges of the Survey Area. They are well drained soils found in convex positions at 200 to 3,500 feet amsl. The soil profiles are composed of sandy loam, loam, sandy clay loam, and weathered bedrock derived from granodiorite. These soils are not hydric and typically have moderately high permeability, with high runoff. The soil is 40 to 60 inches to bedrock.

Fallbrook sandy loam, 15 to 30 percent slopes, eroded, occurs in the northwest corner of the Survey Area. They are well drained soils found in convex positions at 300 to 2,000 feet amsl. The soil profiles are composed of sandy loam, sandy clay loam, and weathered bedrock derived from granodiorite. These soils are not hydric and typically have moderately high to high permeability, with high runoff. The soil is 20 to 40 inches to bedrock.

Fallbrook-Vista sandy loams, 9 to 15 percent slopes, occur in a small portion of the northeast corner of the Survey Area. They are well drained soils found in convex positions at 200 to 3,900 feet amsl. The soil profiles are composed of sandy loam, loam, sandy clay loam, coarse sandy loam, and weathered bedrock derived from granodiorite and quartz-diorite. These soils are not hydric and typically have moderately high to high permeability, with low or high runoff. The soil is 20 to 60 inches to bedrock.

Fallbrook-Vista sandy loams, 15 to 30 percent slopes, occur throughout the northeastern portion of the Survey Area. They are well drained soils found in convex positions at 200 to 3,900 feet amsl. The soil profiles are composed of sandy loam, coarse sandy loam, loam, sandy clay loam, and weathered bedrock derived from granodiorite and quartz-diorite. These soils are not hydric and typically have moderately high to high permeability, with medium or very high runoff. The soil is 20 to 60 inches to bedrock.

Placentia sandy loam, 2 to 9 percent slopes, warm mean annual air temperature (MAAT), Major Land Resource Area (MLRA) 19, occurs in the southeastern corner of the Survey Area. They are well drained soils found in linear and convex positions at 150 to 2,950 feet amsl. The soil profiles are composed of sandy loam, sandy clay, and sandy clay loam derived from granitoid. These soils are not hydric and typically have moderately low to moderately high permeability, with low runoff. The soil is more than 80 inches to bedrock.

Visalia sandy loam, 2 to 5 percent slopes, occurs throughout the central and southwest portion of the Survey Area. They are well drained soils found in linear and convex positions at 0 to 1,500 feet amsl. The soil profiles are composed of sandy loam, fine sandy loam, and very fine sandy loam derived from granite. These soils are not hydric and typically have high permeability, with very low runoff. The soil is more than 80 inches to bedrock.

Vista course sandy loam, 15 to 30 percent slopes, eroded, occurs in the southwest portion of the Survey Area. They are well drained soils found in convex positions at 400 to 3,900 feet amsl. The soil profiles are composed of coarse sandy loam, sandy loam, and weathered bedrock derived from granodiorite and quartz-diorite. These soils are not hydric and typically have high permeability, with medium runoff. The soil is 20 to 40 inches to bedrock.

5.2 JURISDICTIONAL WATERS DELINEATION

The findings of the database review and field delineation of jurisdictional waters are described below. The results of this jurisdictional delineation document the investigation, best professional judgement, and conclusions of Chambers Group (Figure 5: Jurisdictional Waters Assessment Map). However, this delineation of potential jurisdictional waters will be determined by the USACE.

Rainfall in the vicinity of the Survey area was above normal for the month of February 2024, when the survey was conducted. According to Weather Underground weather data (Weather Underground 2024), the total precipitation for the general area for December 2023, January, February and March 2024 was approximately 2.73 inches, while the average for the same months in the past 5 years was 1.79 inches. Therefore, conditions were suitable to determine surface water connectivity during the survey.

5.2.1 Hydrology and Connectivity

The Action Area is located in three sub-watersheds, all within the San Luis Rey-Escondido Watershed. The northeast portion of the Project is located within the Paradise Creek – San Luis Rey River Sub-watershed (Hydrologic Unit Code 12 [HUC12] 180703030201), the northwest corner of the Project is located within the Keys Creek Sub-watershed (HUC12 180703030204), and the southern area of the Project is located within the Moosa Canyon Sub-watershed (HUC12 180703030301). The Project is within the Federal Emergency Management Agency (FEMA) Zone A(E), Area of High Risk Flood Hazard, (Figure 3: Watersheds Map). The Survey Area is within the foothills west of Paradise Mountain, a part of the Peninsular Mountain Ranges. According to the NWI and NHD databases (Figure 4: NWI and NHD Map), waters initially flow in different directions based on the topography of the three sub-watersheds encompassing the Survey Area, before all discharging into the San Luis Rey River which flows parallel to State Route (SR) 76 before eventually emptying into the Pacific Ocean, between Oceanside and Marine Corps Base Camp Pendleton.

Paradise Creek, fed by seasonal rainfall, flows from the foothills of Paradise Mountain in a westerly direction into the northeastern portion of the Survey Area in the Paradise Creek - San Luis Rey River sub-watershed. After it crosses Canal Road, Paradise Creek exits the Survey Area and turns northwards. A network of tributaries also enters the northeastern portion of the Survey Area, north of Paradise Creek, flows southwest through the Survey Area, and feeds into Paradise Creek just west of the Survey Area. Paradise Creek then continues north, merges with its major tributary, Hell Creek, and continues northwest until discharging into the San Luis Rey River within the Rincon Reservation. The San Luis Rey River feeds into the Pacific Ocean approximately 23 miles west of the Survey Area. Therefore, the San Luis Rey River is a TNW.

Seasonal rainfall from the northwestern portion of the Survey Area, within the Keys Creek sub-watershed west of South San Pasqual Road, flows down the hillsides into an intermittent drainage. The drainage generally flows westward until it crosses Valley Center Road and enters the Keys Creek Preserve. At this point the drainage turns north-northwest and continues flowing until discharging into Keys Creek. Keys Creek flows northwest until it discharges into the San Luis Rey River, south of the SR 76 – Interstate 15 (I-15) interchange.

Seasonal rainfall from the rest of the Survey Area, within the Moosa Canyon sub-watershed, drains from the surrounding foothills and hillsides and converges into an ephemeral drainage beginning at the intersection of Woods Valley Road and Coolwater Ranch Lane. The ephemeral drainage initially flows westward, parallel to Woods Valley Road, before it turns generally northwest and eventually drains into Turner Lake. The waters from Turner Lake discharge as the Moosa Canyon Stream in a generally northwest direction, until it reaches the I-15. Moosa Canyon Stream turns and flows northwards, parallelling the I-5 until it crosses the interstate at Camino del Rey, becoming Moosa Creek and turning westward. Moosa Creek follows Camino del Rey for most of the street's length, before turning southwest and emptying into the San Luis Rey River in the unincorporated municipality of Bonsall.

5.2.2 Delineated Non-Wetland Waters Within the Survey Area

Non-wetland waters within the Survey Area included drainages, which were characterized and mapped according to their OHWM and bank to bank limits. OHWM limits were identified by break in slopes, changes in particle-sized distribution, change in vegetation type and density, exposed roots, disturbed leaf litter, water staining, instream bedforms including pools and riffles, and wracking of organic litter. Bank to bank limits were identified by the break in slope and outer dripline of riparian canopies where riparian communities were present. Vegetation communities are described in Section 5.3: Vegetation Communities.

Several drainages appeared to have connectivity to the San Luis Rey River by following the path of flow via Paradise Creek, Keys Creek, and Moosa Canyon Stream as described above. The OHWM and bank to bank features within the Survey Area, and connectivity to the San Luis Rey River, are mapped in Figure 5: Jurisdictional Waters Assessment Map. Table 1, below, contains a description of each drainage analyzed during the field survey along with the page number where each is displayed in Figure 5: Jurisdictional Waters Assessment Map, as applicable. Note that the numbering of Drainages skips D1, D3, D13, D14, and D16 because these were drainages documented by the NWI and NHD that appeared to come close to the Survey Area boundary Figure 4: NWI and NHD Map) but were confirmed to be outside of the Survey Area during the field survey.

Table 1: Description of Drainages within the Survey Area

Drainage	Description	Page # in Figure 5
D2	Drainage D2 enters the Survey Area at Martinez Ln. as an ephemeral drainage and flows northwest until the intersection of Woods Valley Rd. and Huchkulk Wy. From there, D2 flows generally westward along the north and then south side of Woods Valley Rd., before sharply turning and flowing north at Coolwater Ranch Ln. for approximately 105 ft. D2 then continues generally flowing westward, following the north side of Woods Valley Rd. D2 continues northwest, feeds into Turner Lake, and then continues as an ephemeral stream (Moosa Canyon Stream) until it reaches Interstate-15 (I-15). As D2 crosses under I-15, it is fed by several tributaries and becomes an intermittent stream. D2 continues northwest and has connectivity to the San Luis Rey River, a TNW which continues westwards and terminates at the Pacific Ocean. Soil pits were dug within D2 which aided in defining wetland limits for D2-W1 and D2-W2 (below).	1, 5
D4	Drainage D4 is located in a disturbed field northeast of the intersection of Woods Valley Rd. and Callie Wy. D4 enters the Survey Area from the east, flows northwest for approximately 175 ft., and terminates at a topographical depression, which is classified as an NHD Sink, along a fence line at the border with another disturbed field. According to historical aerial imagery, the field containing D4 has been periodically tilled; however, historical aerial imagery available through May 2023 shows the drainage has persisted along the historic NHD path (Google LLC 2024). The NHD path of D4 does not continue westward from the sink, and no drainage was observed west of the sink in the field or in historical aerial imagery (Google LLC 2024). Therefore, D4 appears to lack connectivity to a TNW.	5
D4.1	Drainage D4.1 receives runoff from Woods Valley Rd. and residential development south of the Survey Area via a culvert under Woods Valley Rd. Water flows northwards and terminates with D4 at a sink along the fence line between two disturbed fields. Therefore, D4.1 appears to lack connectivity to a TNW.	5
D5	Drainage D5 was historically classified as an isolated freshwater forested/shrub wetland by the NWI. According to historical aerial imagery (Google LLC 2024) grading occurred in the area beginning in 2007/2008 for roads and residential development. Hydrology of the area has since been manipulated to flow along roadside ditches through culverts under houses and the roadway along Kewaak Wy. and Lucky Ln. The drainage appears to terminate at agricultural development south of Lucky Ln. Therefore, D5 appears to lack connectivity to a TNW.	2, 4
D5.1	Drainage D5.1 receives runoff from a slope and residential development on the north side of Kewaak Wy. before entering a culvert under the intersection of Kewaak Wy. and Kewaak Ln. It then feeds into Drainage D5, which follows Kewaak Wy. and Lucy Ln. before terminating at agricultural development. Therefore, D5.1 appears to lack connectivity to a TNW.	2

Drainage	Description	Page # in Figure 5
D6	Drainage D6 originates east of Morning Star Dr. and enters the Survey Area where it receives water from the surrounding hills and residences and tributary Drainage D6.1 (below). D6 continues southwest out of the Survey Area and re-enters the Survey Area at a private residence where it feeds into a topographical depression in which a swimming pool has been installed. D6 then continues south where it exits then re-enters the Survey Area, crosses under Kewaak Way, turns west and then appears to terminate at agricultural development as it meets Lucky Lane. Therefore, D6 appears to lack connectivity to a TNW.	2, 4
D6.1	Drainage D6.1 receives water from hills and residences to the north and flows southward, passing through two culvert sections of the Survey Area where it flows under a private driveway and Ihpaar Ln., before feeding into D6. Therefore, D6.1 appears to lack connectivity to a TNW. Residential development took place in the path of this drainage from 2012 - 2016, but the drainage still appears to follow the same general pathway as it did prior to development.	4
D7	Drainage D7 begins within the Survey Area southeast of the intersection of Kunyaaw Path and Hattepaa Rd. D7 crosses under Kunyaaw Path, receives water from a tributary (Drainage 7.1, below) and continues as Keys Creek west of the Survey Area. Keys Creek flows northwest and connects to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	6
D7.1	Drainage 7.1 facilitates runoff from the south and culverts from the east towards Drainage D7. Drainage D7 continues along Keys Creek and connects to the San Luis Rey River, as described above.	3, 6
D8	Drainage D8 originates within the Survey Area, east of Kunyaaw Path and south of Kumeyaay Wy., and flows eastward. Once outside the Survey Area, D8 turns and flows south along the bottom of a canyon. D8 then re-enters the Survey Area, crosses under Agustine Orosco Ln., and terminates at D8-W1 which is classified as an NHD Sink. Therefore, D8 appears to lack connectivity to a TNW.	7
D8.1	Drainage 8.1 is a small tributary of D8 that originates just east of D8, north of Augustine Orosco Ln. Drainage D8.1 facilitates runoff on the north side of the road into Drainage D8. Drainage D8 terminates at an NHD and lacks connectivity to a TNW, as described above.	7
D9	Drainage D9 receives water from foothills east of the Survey Area and flows west into the Survey Area near Eshash Rd. D9 then crosses the former pathway of the Escondido Canal, and continues westward past N. Lake Wohlford Rd. After leaving the Survey Area, D9 appears to continue westward and then south, through a network of agricultural fields, before merging with Drainage D4. D4 appears to terminate at a topographical depression classified as an NHD sink. Therefore, D9 appears to lack connectivity to a TNW.	7, 9, 12
D10	Drainage D10 is the former pathway of the Escondido Canal. This drainage was shifted west and undergrounded in 2022. The former path of D10 entered the Survey Area west of Oos Pl., flowed generally southwards before meandering back and forth along both sides of Canal Rd., and exited the Survey Area south	N/A

Drainage	Description	Page # in Figure 5
	of Paradise Mountain Rd. The new path of the undergrounded canal turns west along Tokama Ln., turns south and then west to Lake Wohlford Rd., and then follows Lake Wohlford Rd. south to Maemar Dr. D10 no longer flows above ground within the Survey Area and therefore was not delineated.	
D11	Drainage D11 receives water from south-facing slopes north of Oos Pl. D11 flows southwest as it crosses through the Survey Area, and under Oos Pl., twice. D11 then joins with Drainage D12 and continues north as Paradise Creek, and connects to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	14
D11.1	Drainage 11.1 is a small tributary of Drainage D11 that originates just north of D10, on the west side of Oos Rd. Drainage D11.1 facilitates southwards into Drainage D11. Drainage D11 has connectivity to a TNW that connects to the Pacific Ocean, as described above.	14
D12	Drainage D12 originates from hills east of the Survey Area and flows in a southwest direction. D12 enters and exits the Survey Area in multiple locations. Wetland D12-W1 was present within the drainage. After exiting the Survey Area, D12 continues west, joins with Drainage D11, continues north as Paradise Creek, and connects to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	8, 13, 14, 15
D12.1	Drainage 12.1 receives water from south-facing slopes north of Oos Pl., crosses through the Survey Area and under Oos Pl., and joins with D12. Drainage D12 connects to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	14, 15
D12.2	Drainage 12.2 receives water from south-facing slopes north of Oos Pl., crosses through the Survey Area and under Oos Pl., continues south, and joins with D12. Just before joining with D12, Drainage D12.1 enters the Survey Area where wetland D12.2-W1 is present within the drainage. Drainage D12 connects to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	14
D15	Drainage D15 is named Paradise Creek as it enters the Survey Area from the east. As it enters the Survey Area, wetland D15-W1 is present within the drainage. D15 flows westward across the Survey Area. After exiting the Survey Area, Paradise Creek turns north and bends east briefly before connecting to the San Luis Rey River, a TNW that connects to the Pacific Ocean.	8, 13, 15
D17	Drainage 17 enters the Survey Area south of Alvarado Sun Clan Wy. The drainage facilitates water from surrounding slopes and residential runoff southwest through the Survey Area, crosses Alvarado Sun Clan Wy. and then Tellypuu Rd., and then flows south. The drainage terminates at culverts at the former Escondido Canal (D10). D17 appears to lack connectivity to a TNW.	10
D18	Drainage D18 enters the southeastern portion of the Survey Area north of Paradise Mountain Rd. D18 flows generally westward, following Paradise Mountain Rd. After exiting the Survey Area, the historical path of D18 follows northwest and connects to D4. D18 passes through a network of agricultural fields on its way to D4 and the drainage path of D18 from the Survey Area to D4 is not apparent on aerial imagery. D4 terminates at a topographical depression (an NHD Sink) and therefore appears to lack connectivity to a TNW.	10, 11

Drainage	Description	Page # in Figure 5
D19	Drainage 19 was mapped in the NHD as a stream/river that flowed northwest through the Survey Area across Muckenuway Ln. and Martinez Ranch Ln., and then westward before terminating at the former Escondido Canal (D10). No bed, bank, channel, or OHWM were observed for this drainage. The area where D19 is mapped in the NHD to cross the Survey Area contains roads and residential development. The hydrology of the area has been manipulated and D19 appears to no longer be present.	N/A
D20	Drainage 20 receives water from a south facing slope originating at the end of Hayak Dr. D20 flows in a south direction, following the east side of south San Pasqual Rd., entering and exiting the Survey Area in multiple locations. D20 turns southwest and flows across North Lake Wohlford Rd., where it exits the Survey Area and appears to terminate within a large area of ornamental landscaping and development. Therefore, D20 appears to lack connectivity to a TNW.	6, 8

Table 2, below, provides a breakdown of the acreage within the OHWM and bank to bank features, as well as the linear feet of each drainage within the Survey Area.

Table 2: Summary of Potential Jurisdictional Drainages Within the Ordinary High Water Mark (OHWM) and Bank to Bank (BTB) within the Survey Area

Drainage	Estimated Amount of Drainage within Survey Area		
	OHWM Area (acres)	BTB Width (acres)	Linear Ft
D2	0.32	3.98	2,659
D4	0.01	0.01	163
D4.1	0.02	0.04	252
D5	0.19	0.28	1,336
D5.1	0.04	0.07	612
D6	0.20	1.82	1,619
D6.1	0.01	0.06	447
D7	0.01	0.17	579
D7.1	0.04	0.06	526
D8	0.01	0.86	508
D8.1	0.004	0.01	108
D9	0.21	4.93	1,828
D11	0.10	0.16	1,511
D11.1	0.002	0.01	110
D12	3.35	6.35	2,356
D12.1	0.10	0.26	1,076
D12.2	0.02	0.87	859
D15	1.09	6.07	2,102

Drainage	Estimated Amount of Drainage within Survey Area		
	OHWM Area (acres)	BTB Width (acres)	Linear Ft
D17	0.12	0.25	1,868
D18	0.07	1.62	1,563
D20	0.08	0.36	1,812
Total	**6.00**	**28.24**	**23,894**

Vegetation communities mapped during the survey were overlaid onto the OHWM and BTB features of each drainage to determine the acreage of each community per drainage. Table 3 provides a summary of acreages of potential jurisdictional waters that occur within the OHWM and Bank to Bank within the Survey Area.

Table 3: Vegetation within Potential Jurisdictional Waters Within the Ordinary High Water Mark (OHWM) and Bank to Bank (BTB) within the Survey Area

Vegetation Communities (acres)		
	OHWM	**BTB**
Upland		
Mission Manzanita Chaparral	0.36	1.41
Disturbed Mission Manzanita Chaparral	0.01	0.08
California Buckwheat Scrub	0.01	0.04
Disturbed California Buckwheat Scrub	0.02	0.10
Laurel Sumac Scrub	0.09	0.18
Disturbed Laurel Sumac Scrub		0.002
Mulefat Thicket	0.003	0.06
Coast Live Oak Woodland	0.07	0.40
Disturbed Coast Live Oak Woodland	0.0009	0.05
Hoary Leaf Ceanothus Chaparral	0.0001	0.01
Scrub Oak Chaparral	0.05	0.13
Disturbed California Sagebrush Scrub	0.02	0.02
Rocky Outcrop	--	0.11
Riparian		
California Sycamore - Coast Live Oak Riparian Woodland	4.74	20.76
Gooddding's Willow - Red Willow Riparian Woodland	0.24	3.22
Other		
Developed	0.15	0.47
Ruderal	0.08	0.69
Bare Ground	0.08	0.14
Ornamental Landscaping	0.08	0.36
Total	**6.00**	**28.24**

5.2.3 Delineated Wetlands within the Survey Area

Five wetlands mapped in the NWI and NHD databases were found to be present during the field survey (Figure 4: NWI and NHD Map and Figure 5: Jurisdictional Waters Assessment Map). These wetlands were found within several drainages. Wetlands D2-W1, D2-W2, D12-W1, and D15-W1 were found within drainages D2, D12, and D15, which show connectivity to the San Luis Rey River, a TNW. Wetland D8-W1 was present within the downstream terminus of Drainage D8, where the drainage appeared to lose downstream connectivity. These wetlands are described in Table 4, below.

Table 4: Description of Wetlands within the Survey Area

Wetland	Description	Page # in Figure 5
D2-W1	D2-W1 was present within a portion of D2, west of Coolwater Ranch Rd. This wetland was found to be present along an approximately 750-foot stretch of the Survey Area containing Goodding's Willow - Red Willow Riparian Woodland. D2 west of this area did not contain wetland vegetation. A soil pit for Sampling Pit 1 (found to by non-hydric) was dug in a terrace of facultative vegetation adjacent to the Goodding's Willow - Red Willow Riparian Woodland community and aided in defining the wetland boundary.	1
D2-W2	Wetland D2-W2 is an NWI-mapped emergent wetland northeast of the intersection of Woods Valley Rd. and Coolwater Ranch Ln. that was found to be present with connection to D2. This wetland contained patches of cattails (*Typha* sp.) within a disturbed field that has historically been used as a parking lot during the dry season based on historical aerial imagery (Google LLC 2024). A test soil pit was dug within this wetland which confirmed presence of hydric soils.	1, 5
D8-W1	Wetland D8-W1 is an NWI-mapped wetland present within D8 at the southern terminus of Drainage D8. Goodding's Willow - Red Willow Riparian Woodland was present within the wetland. Sampling Point 5 and additional test soil pits were dug to aid in delineating the wetland south of the private driveway separate from the riparian habitat north of the driveway. The two areas were connected by a culvert under the driveway.	7
D12-W1	Wetland D12-W1 is an NWI-mapped freshwater forested/shrub wetland found to be present within Drainage D12. Test pits were dug which confirmed the presence of hydric soils. Vegetation within the wetland was dominated by California Sycamore - Coast Live Oak Riparian Woodland.	8, 13, 14, 15
D12.2-W1	Wetland D12.2-W1 is an NWI-mapped freshwater forested/shrub wetland found to be present within Drainage D12.2. Vegetation within the wetland was dominated by California Sycamore - Coast Live Oak Riparian Woodland.	14
D15-W1	Wetland D15-W1 is an NWI-mapped freshwater forested/shrub wetland found to be present within Drainage D15. Sampling Points 2 and 4 were taken within the wetland, and Sampling Point 3 was taken outside the wetland; data from these efforts helped to delineate wetland boundaries. Vegetation within the wetland was dominated by California Sycamore - Coast Live Oak Riparian Woodland.	8, 13

Table 5, below, displays a summary of the acreage of each wetlands within the Survey Area. The paragraphs following Table 5 provide details on Sampling Points where data was recorded onto Wetland Delineation Forms. These Sampling Points, along with test soil pits, aided in the delineation of wetland boundaries.

Table 5: Summary of Acreages of Wetlands Within the Survey Area

Wetland	Acreage within Survey Area
D2-W1	1.20
D2-W2	0.24
D8-W1	0.52
D12-W1	5.99
D12.2-W1	0.77
D15-W1	4.56
Total	**13.28**

The soil pit for Sampling Point 1 (shown on page 1 of Figure 5: Jurisdictional Waters Assessment Map) was dug outside the perimeter of wetland D2-W1. The whole 16-inch soil profile was identified as a sandy loam with a color of 10YR 4/2. Hydric soils were not found to be present. Hydrological indicators included a high water table that was present at a depth of 14 inches within the soil pit, and saturation. Hydrophytic vegetation indicators included the dominance test being over 50 percent, and the prevalence index being at 3.0. Therefore, Sampling Point 1 was not considered to be within a wetland.

The soil pit for Sampling Point 2 (shown on page 13 of Figure 5: Jurisdictional Waters Assessment Map) was dug within the wetland boundary of wetland D15-W1. Hydric soils were found to be present. The top 8 inches of the soil profile was identified as a silty clay loam with a color of 92 percent 10YR 2/1, with 8 percent 2.5YR 4/6 redox feature concentrations in matrix. From 8 to 12 inches, the soil profile revealed clay loam with a color of 80 percent 10YR 2/1, with 20 percent 2.5YR 4/6 redox feature concentrations in matrix. From 12 to 16 inches, the soil profile was identified as sandy loam with a color of 2.5/N. Hydric soils exist as redoximorphic features were observed in the soil pit. Hydrological indicators included surface water, high water table present at a depth of 10 inches within the soil pit, water-stained leaves, hydrogen sulfide odor, water marks, and sediment and drift deposits. Hydrophytic vegetation indicators included the dominance test being over 50 percent, and the prevalence index being below 3.0. Therefore, Sampling Point 2 was considered to be within a wetland.

The soil pit for Sampling Point 3 (shown on page 13 of Figure 5: Jurisdictional Waters Assessment Map) was dug outside the wetland boundary of wetland D15-W1. Hydric soils were not found to be present. The top 4 inches of the soil profile was identified as a silty loam with a color of 10YR 4/3. From 4 to 6 inches, the soil profile revealed sandy soil of 10YR 4/2. From 6 to 16 inches, the soil profile was identified as sandy loam with a color of 97 percent 10YR 3/3, with 3 percent 2.5YR 4/6 redox feature concentrations in matrix. No hydrological indicators exist at the top of the bank slope. No hydrophytic vegetation indicators exist, with the dominance test being under 50 percent, and the prevalence index being above 3.0. Therefore, Sampling Point 3 was not considered to be within a wetland.

The soil pit for Sampling Point 4 (shown on page 13 of Figure 5: Jurisdictional Waters Assessment Map) was dug within the wetland boundary of wetland D15-W1. The top 6 inches of the soil profile was identified as sandy clay loam with a color of 10YR 2/1. From 6 to 8 inches the soil profile revealed sandy clay loam with a color of 90 percent 10YR 2/2, with 10 percent 2.5YR 3/6 redox feature concentrations in matrix. From 8-12 inches the soil profile was identified as sandy loam with a color of 90 percent 10YR 3/3, with 10 percent 2.5YR 3/6 redox feature concentrations in matrix. From 12 to 16 inches the soil profile was revealed to be sand. Hydric soils exist as redoximorphic features were observed in the soil pit. Hydrological indicators included surface water with a depth of 8 inches, water-stained leaves, water marks, drainage patterns, and sediment and drift deposits. Hydrophytic vegetation indicators included the dominance test being over 50 percent, and the prevalence index being below 3.0. Therefore, Sampling Point 4 was considered to be within a wetland.

The soil pit for Sampling Point 5 (shown on page 7 of Figure 5: Jurisdictional Waters Assessment Map) was dug within the Bank to Bank limits of Drainage D8 and aided in the delineation of wetland D8-D1 south of the soil pit. The top 5 inches of the soil profile was identified as sand. From 5 to 9 inches the soil profile was revealed to be sandy clay loam with a color of 10YR 3/3. From 9 to 12 inches the soil profile was identified as sand. From 12 to 14 inches the soil profile was identified as sandy clay loam with a color of 10YR 3/3 and had a black organic layer. From 14 to 16 inches the soil profile was identified as sand. No wetland hydrology was present as only a secondary indicator of saturation visible on aerial imagery was observed. There was a hydrophytic vegetation indicator of the dominance test being over 50 percent, but the prevalence index was over 3.0. Therefore, Sampling Point 5 was not considered to be within a wetland.

Vegetation Communities within Wetlands

Vegetation communities that dominated wetlands within the Survey Area included California Sycamore - Coast Live Oak Riparian Woodland and Goodding's Willow - Red Willow Riparian Woodland as shown in Table 6, below. These vegetation communities are described in Section 5.3.

Table 6: Vegetation Communities within Wetlands Delineated Within the Survey Area

Vegetation Communities	Acreage within Wetlands
Disturbed Mission Manzanita Chaparral	0.004
California Buckwheat Scrub	0.01
Disturbed Laurel Sumac Scrub	0.002
Coast Live Oak Woodland	0.10
Disturbed Coast Live Oak Woodland	0.01
California Sycamore - Coast Live Oak Riparian Woodland	11.23
Goodding's Willow - Red Willow Riparian Woodland	1.69
Cattail Marshes	0.27
Rocky Outcrop	0.10
Developed	0.06
Ruderal	0.37
Ornamental Landscaping	0.01
Total	**13.86**

5.2.4 Potential USACE Jurisdiction

The USACE regulates discharge of dredged and/or fill material into WoUS. These waters include wetland and non-wetland bodies of water that meet specific criteria, outlined in Section 2 – Applicable Regulations. USACE regulatory jurisdiction pursuant to Section 404 of the CWA is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct or through a tributary system linking a stream channel with a TNW.

Based on the database review and field observations during the delineation, several drainages within the Survey Area appear to directly connect to the San Luis Rey River, a TNW. As defined by the OHWMs, a total of 5.04 acres of potential non-wetland WoUS are present within the Survey Area and are potentially under the jurisdiction of the USACE. Approximately 0.27 acre of potential non-wetland WoUS is present within Temporary Impact Areas and 0.01 acre of potential non-wetland WoUS is present within Permanent Impact Areas. Permanent Impact Areas include permanent Project facilities. Temporary Impact Areas include all other portions of the Action Area and six proposed Staging Areas. These impact areas are shown in Figure 5. A breakdown of this acreage is provided in Table 7, below.

Table 7: Summary of Acreages of Potential Jurisdictional Non-Wetland Drainages within the Survey Area and Impact Areas

Drainage	Acreage within OHWM (Survey Area)	Acreage within OHWM (Temp. Impact Areas)	Acreage within OHWM (Perm. Impact Areas)
D2	0.32	0.01	0.0007
D7	0.01	0.0005	--
D7.1	0.04	0.01	--
D11	0.10	0.01	0.0002

Drainage	Acreage within OHWM (Survey Area)	Acreage within OHWM (Temp. Impact Areas)	Acreage within OHWM (Perm. Impact Areas)
D11.1	0.002	0.001	0.00005
D12	3.35	0.21	0.01
D12.1	0.10	0.01	0.00003
D12.2	0.02	0.01	--
D15	1.10	0.004	--
Total	**5.04**	**0.27**	**0.01**

Additionally, several wetlands are within drainages that appear to connect to a TNW. These wetlands include D2-W1, D2-W2, D12-W1, D12.2-W1, and D15-W1. D8-W1 is located at the southern, downstream terminus of Drainage 8 and does not appear to have connectivity to a TNW. As such, a total of 12.76 acres of wetland vegetation are present within the OHWM boundaries of the Survey Area and are potentially under the jurisdiction of the USACE. Approximately 0.65 acre of wetland vegetation is present within Temporary Impact Areas and 0.01 acre of wetland vegetation is present within Permanent Impact Areas. Wetland vegetation within the Survey Area was dominated by California Sycamore - Coast Live Oak Riparian Woodland and Goodding's Willow - Red Willow Riparian Woodland. A summary of acreages of each of these wetlands within the Survey Area is provided in Table 8, below.

Table 8: Summary of Acreages of Potential Jurisdictional Wetlands within the Survey Area and Impact Areas

Wetland	Acreage Within Survey Area	Acreage within Temp. Impact Areas	Acreage within Perm. Impact Areas
D2-W1	1.20	--	--
D2-W2	0.24	0.01	--
D12-W1	5.99	0.48	0.02
D12.2-W1	0.77	--	--
D15-W1	4.56	0.16	--
Total	**12.76**	**0.65**	**0.02**

5.3 VEGETATION COMMUNITIES

Seventeen native vegetation communities and five other land cover types were identified within the Survey Area (Table 9). These communities and land cover types are described in the following subsections and a map showing their distribution within the Survey Area is provided in Figure 6a: Vegetation Communities Map. Figure 6b: Vegetation Communities Map – WWTP Location, shows a zoomed-in view of vegetation communities within and immediately surrounding the WWTP location. Approximately 224.54 acres of native vegetation communities are present within the Survey Area, including 28.82 acres within Temporary Impact Areas and 1.16 acre in Permanent Impact Areas. Approximately 357.04 acres of other land cover types are present within the Survey Area, including 135.36 acres within Temporary Impact Areas and 4.40 acre in Permanent Impact Areas. Permanent Impact Areas for vegetation impacts include permanent Project facilities, minus the sewer lines; although the sewer lines are permanent project features and calculated as such for impacts to waters under potential USACE jurisdiction, vegetation communities along the sewer right-of-way are anticipated to be restored as part of Project close-out. Temporary Impact Areas include all other portions of the Action Area and six proposed Staging Areas. The Project has been designed to utilize existing developed areas including roads, bare ground, and disturbed areas to the greatest extent feasible to avoid impacts to native vegetation communities.

Table 9: Vegetation Communities and Land Cover Types Occurring Within the Survey Area

Vegetation Communities	Acreage within Survey Area	Acreage within Temp. Impact Areas	Acreage within Perm. Impact Areas
Native			
Mission Manzanita Chaparral	86.26	8.14	--
Disturbed Mission Manzanita Chaparral	6.13	0.92	--
California Buckwheat Scrub	8.46	1.64	--
Disturbed California Buckwheat Scrub	7.69	2.28	0.12
Laurel Sumac Scrub	24.78	2.99	--
Disturbed Laurel Sumac Scrub	3.49	0.77	--
Mulefat Thicket	0.06	--	--
Coast Live Oak Woodland	23.34	3.75	0.71
Disturbed Coast Live Oak Woodland	11.99	2.71	--
California Sycamore-Coast Live Oak Riparian Woodland	26.67	3.47	0.33
Goodding's Willow-Red Willow Riparian Woodland	3.70	0.21	--
Hoary Leaf Ceanothus Chaparral	7.01	0.36	--
Disturbed Hoary Leaf Ceanothus Chaparral	0.11	--	--
Scrub Oak Chaparral	9.67	0.87	--
Cattail Marshes	0.32	0.12	--
California Sagebrush Scrub	0.35	0.10	--
Disturbed California Sagebrush Scrub	3.41	0.39	--
Rocky Outcrop	1.10	0.10	--
Total Native	**224.54**	**28.82**	**1.16**
Other			
Developed	174.28	76.18	0.17
Ruderal	104.58	32.41	4.05
Bare Ground	13.64	9.37	0.07
Ornamental Landscaping	64.54	17.60	0.11
Total Other	**357.04**	**135.56**	**4.40**
Grand Total	**581.58**	**164.38**	**5.56**

5.3.1 Mission Manzanita Chaparral

Mission Manzanita Chaparral is found growing on the lower to upper portions of slopes of all aspects. Soils within this community are typically shallow and sandy (Sawyer et al. 2009). Stands occur in the Santa Ana Mountains (Klein and Evens 2005), and central and western San Diego Co. (Evens and San 2005, Gordon and White 1994) on soils derived from granite, though some occur on. In this vegetation community, mission manzanita (*Xylococcus bicolor*) is dominant or co-dominant with chamise (*Adenostoma fasciculatum*) in the shrub canopy with hoary leaf ceanothus (*Ceanothus crassifolius*), Ramona lilac (*Ceanothus tomentosus*), chaparral yucca (*Hesperoyucca whipplei*), toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), scrub oak (*Quercus berberidifolia*), holly leaf redberry (*Rhamnus ilicifolia)*, sugarbush (*Rhus ovata*), white sage (*Salvia apiana*) and black sage (*Salvia mellifera*). The canopy is intermittent to continuous, and the herbaceous layer is sparse to intermittent (Sawyer et al. 2009).

Areas with Mission Manzanita Chaparral vegetation are present within 86.26 acres of the Survey Area, on various aspects of slopes within the northern and northwestern portions of the Survey Area, primarily adjacent to roads or Developed areas. Native plant species found on the Survey Area typical of this vegetation community included: mission manzanita, hoary leaf ceanothus, California buckwheat (*Eriogonum fasciculatum*)*,* deerweed (*Acmispon glaber*), black sage, and sugarbush. Non-native species include: broad-lobed filaree (*Erodium botrys*), red-stemmed filaree (*Erodium cicutarium*), and shortpod mustard (*Hirschfeldia incana*).

5.3.2 Disturbed Mission Manzanita Chaparral

Disturbed Mission Manzanita Chaparral areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed Mission Manzanita Chaparral vegetation is present within 6.13 acres of the Survey Area on various slope aspects within the center of the Survey Area adjacent to larger Developed areas. Native plant species found on the Survey Area typical of this vegetation community included: mission manzanita, chamise, hoary leaf ceanothus, Ramona lilac, chaparral yucca, toyon, laurel sumac, scrub oak, holly leaf redberry, sugarbush, and black sage. Non-native species include: ripgut grass (*Bromus diandrus*), tocalote (*Centaurea melitensis*), shortpod mustard, and common sow thistle (*Sonchus oleraceus*).

5.3.3 California Buckwheat Scrub

California Buckwheat Scrub is found in upland slopes, intermittently flooded arroyos, channels and washes, and rarely flooded low-gradient deposits. Soils are coarse, well drained, and moderately acidic to slightly saline (Sawyer et al. 2009). Stands do well on rocky sites and in shallow soils, and they establish after disturbance by fire or flood or after heavy grazing. In southern coastal California, this alliance is usually one of the first of the coastal scrubs to establish in mechanically disturbed areas such as road cuts or slope failures, and it persists in areas with light to moderate grazing (Sawyer et al. 2009). In this vegetation community, California buckwheat or yucca is dominant or co-dominant in the shrub canopy in cismontane stands with California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), sticky monkeyflower (*Diplacus aurantiacus*), brittlebush sunflower (*Encelia californica*), brittlebush (*Encelia farinosa*), coast goldenbush (*Isocoma menziesii)*, deerweed, white sage, or black sage. The herbaceous layer is variable and may be grassy (Sawyer et al. 2009).

Areas with California Buckwheat Scrub vegetation are present within 8.46 acres of the Survey Area on upland slopes and washes within the southern and southwestern portions of the Survey Area. Native plant species found on the Survey Area typical of this vegetation community included: California buckwheat, black sage, and California sagebrush. Non-native species include: giant reed (*Arundo donax)*, blue gum (*Eucalyptus globulus*), and silver dollar eucalyptus (*Eucalyptus pulverulenta*).

5.3.4 Disturbed California Buckwheat Scrub

Disturbed California Buckwheat Scrub areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed California Buckwheat Scrub vegetation is present within 7.69 acres of the Survey Area within the southern and southwestern portions of the Survey Area adjacent to Developed or Ruderal areas. Native plant species found on the Survey Area typical of this vegetation community included: California sagebrush, California buckwheat, chamise, deerweed, and golden yarrow (*Eriophyllum confertiflorum*). Non-native species include: ripgut grass, tocalote, shortpod mustard, and blue-eye cape marigold *(Dimorpotheca sinuata*).

5.3.5 Laurel Sumac Scrub

Laurel Sumac Scrub is found along often steep slopes with soils that are shallow and fine textured (Sawyer et al. 2009). Laurel sumac produces large lignotubers, especially with age, which sprout prodigiously when plants are top-killed by fire. Seeds geminate after being scarified by heat and chemicals. Seed germination is moderate in the post-fire conditions as the shrubs renew their crowns (Howard 1992). Laurel sumac has an advantage over coastal sage scrub species that are not stimulated by fire to germinate. However, it is unclear what the natural fire return interval is for this alliance. The shorter fire return intervals in the past 50 years in southern California may account for its dominance in the shrub canopy and the highly variable species composition among stands. Laurel sumac is dominant or co-dominant in the shrub canopy with California sagebrush, big pod ceanothus (*Ceanothus megacarpus*), sticky monkeyflower, California brittle bush, ashy buckwheat, California buckwheat, chaparral yucca, toyon, chaparral beard tongue (*Keckiella antirrhinoides*), holly leaf redberry, lemonadeberry (*Rhus integrifolia*), sugarbush, purple sage (*Salvia leucophylla*), black sage, Parry's tetracoccus (*Tetracoccus dioicus*) and poison oak (*Toxicodendron diversilobum*). Membership rules for vegetation mapping state that chamise should be greater than 50 percent cover or is greater than 30 percent relative cover if co-dominant with California buckwheat or black sage in the shrub canopy (Keeler-Wolf and Evens 2006). Emergent trees or tall shrubs may be present at low cover, including California black walnut, California sycamore (*Platanus racemosa*), coast live oak, and/or blue elderberry.

Areas with Laurel Sumac Scrub vegetation are present within 24.78 acres of the Survey Area along steep slopes primarily within the northwestern section of the Survey Area. Native plant species found on the Survey Area typical of this vegetation community included: laurel sumac, hoary leaf ceanothus, deerweed, black sage, and mission manzanita. Non-native species include: ripgut grass, shortpod mustard, and bristly oxtongue *(Helminthotheca ecioides*).

5.3.6 Disturbed Laurel Sumac Scrub

Disturbed Laurel Sumac Scrub areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed Laurel Sumac Scrub vegetation is present within 3.49 acres of the Survey Area at the northern and southern ends of the Survey Area adjacent to Developed areas. Native plant species found on the Survey Area typical of this vegetation community included: laurel sumac, hoary leaf ceanothus, deerweed, black sage, and mission manzanita. Non-native species include: ripgut grass, tocalote, shortpod mustard, and bristly oxtongue.

5.3.7 Coast Live Oak Woodland

Coast Live Oak Woodland is found in alluvial terraces, canyon bottoms, stream banks, slopes, and flats with soils that are deep, sandy, or loamy with high organic matter (Sawyer et al. 2009). Coast live oak (*Quercus agrifolia*) may be dominant or co-dominant in the tree canopy with black walnut (*Juglans californica*), bigleaf maple (*Acer macrophyllum*), blue oak (*Quercus douglasii*), Engelmann Oak (*Quercus engelmannii*), black oak (*Quercus kelloggii*), valley oak (*Quercus lobata*) and California bay (*Umbellularia californica*). Membership rules for this community state that coast live oak must be greater than 50 percent relative cover in the tree canopy and if California bay trees are present, then those must be less than 33 percent relative cover in the tree canopy (Keeler-Wolf et al. 2003, Evens and San. 2004, Keeler-Wolf and Evens 2006). The canopy is open to continuous, with a shrub layer that is sparse to intermittent and herbaceous layer that is sparse or grassy (Sawyer et al. 2009).

Areas with Coast Live Oak Woodland vegetation are present within 32.34 acres of the Survey Area spanning from the southwestern corner of the project, along the southern border, and into the eastern edge of the Survey Area. Native plant species found on the Survey Area typical of this vegetation community included: coast live oak, Englemann oak, and valley oak. Non-native species include: ripgut grass, stinging nettle (*Urtica dioica*), and dwarf nettle (*Urtica urens).*

5.3.8 Disturbed Coast Live Oak Woodland

Disturbed Coast Live Oak Woodland areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed Coast Live Oak Woodland vegetation is present within 11.99 acres of the Survey Area along the southern and eastern borders of the Survey Area, often in between Developed and Ruderal areas. Native plant species found on the Survey Area typical of this vegetation community included: coast live oak, Englemann oak, and valley oak. Non-native species include: silver dollar eucalyptus, ripgut grass, stinging nettle, and dwarf nettle.

5.3.9 Scrub Oak Chaparral

Scrub Oak Chaparral is primarily found on north-facing, steep slopes, though topography becomes more varied where chamise co-dominates. Soils are typically deep to shallow, are well to extensively drained, and may be rocky. Scrub oak is dominant or co-dominant in the shrub canopy with chamise, redshanks (*Adenostoma sparsifolium*), eastwood manzanita (*Arctostaphylos glandulosa*), big berry manzanita (*Arctostaphylos glauca*), hoary leaf ceanothus, buck brush (*Ceanothus cuneatus*), desert ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), chaparral whitethorn (*Ceanothus leucodermis*), hairy ceanothus (*Ceanothus oliganthus*), greenbark ceanothus (*Ceanothus spinosus*), blueblossom (*Ceanothus thyrsiflorus*), Romona lilac, mountain mahogany (*Cercocarpus betuloides*), California coffeeberry (*Frangula californica*), two petaled ash (*Fraxinus dipetala*), toyon, chaparral pea (*Pickeringia* *montana*), holly leaf cherry (*Prunus ilicifolia*), interior live oak (*Quercus wislizeni*), holly leaf redberry, sugarbush, Poison oak and mission manzanita. Emergent trees may be present at low cover, including California buckeye (*Aesculus californica*), California black walnut, knobcone pine (*Pinus attenuata*), gray pine (*Pinus sabiniana*), coast live oak or Engelmann oak. Membership rules for vegetation mapping state that scrub oak should be greater than 50 percent of the relative cover in the shrub canopy, or greater than 30 percent relative cover with chamise, buck brush and/or other chaparral shrubs (Reyes et al. 2023). Shrubs are typically less than 6 meters tall with a canopy that is continuous and an herbaceous layer that is sparse.

Areas with Scrub Oak Chaparral vegetation are present within 9.67 acres of the Survey Area on north facing slopes within the southeastern and southwestern corners of the Survey Area. Native plant species found on the Survey Area typical of this vegetation community included: scrub oak, chaparral whitethorn, red maids (*Calandrinia menziesii)*, and Miner's lettuce (*Claytonia perfoliata*). Non-native species include: ripgut grass, stinging nettle, and dwarf nettle.

5.3.10 Hoary Leaf Ceanothus Chaparral

Hoary Leaf Ceanothus Chaparral can be found on slopes, often south facing with soils that are typically shallow and rocky. Hoary leaf ceanothus is dominant or co-dominant in the shrub canopy with chamise, big berry manzanita, chaparral whitethorn, mountain mahogany, sticky monkeyflower, California buckwheat, chaparral yucca, toyon, chaparral beard tongue, laurel sumac, scrub oak, sugarbush and black sage. Membership rules state that both hoary leaf ceanothus and chamise have 30 – 60 percent relative cover in the shrub canopy. Emergent trees may be present at low cover, including coast live oak. The shrub canopy is typically less than 3.5 meters and is intermittent to continuous with an herbaceous layer that is open.

Areas with Hoary Leaf Ceanothus Chaparral vegetation are present within 7.01 acres of the Survey Area at higher elevations along the slope within the southeastern and southwestern corners of the Survey Area. Native plant species found on the Survey Area typical of this vegetation community included: hoary leaf ceanothus, chamise, chaparral yucca, chaparral beard tongue, laurel sumac, and sugarbush. Non-native species include: ripgut grass, stinging nettle, shortpod mustard, and London rocket (*Sisymbrium irio)*.

5.3.11 Disturbed Hoary Leaf Ceanothus Chaparral

Disturbed Hoary Leaf Ceanothus Chaparral areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed Hoary Leaf Ceanothus Chaparral vegetation is present within 0.11 acres of the Survey Area at higher elevations along the slope within the southeastern and southwestern corners of the Survey Area, adjacent to Developed areas. Native plant species found on the Survey Area typical of this vegetation community included: hoary leaf ceanothus, chamise, chaparral yucca, black sage, laurel sumac, and sugarbush. Non-native species include: ripgut grass, stinging nettle, shortpod mustard, and London rocket.

5.3.12 California Sagebrush Scrub

California Sagebrush Scrub can be found on steep, east to southwest facing slopes where soils are usually colluvial derived. California sagebrush is dominant or co-dominant in the shrub canopy with black sage, chamise, California bush sunflower, California Buckwheat, chaparral yucca, laurel sumac, lemonadeberry, sugarbush, and white sage. Membership rules state that both California sagebrush and black sage have 30 – 60 percent relative cover in the shrub canopy. Emergent taller shrubs may be present at low cover, including laurel sumac. The shrub canopy is typically less than 2 meters and is intermittent to continuous with an herbaceous layer that is variable (Sawyer et al. 2009).

Areas with California Sagebrush Scrub vegetation are present within 0.35 acres of the Survey Area on the east side of Oos Place where the road turns east. Native plant species found on the Survey Area typical of this vegetation community included: California sagebrush, black sage, chamise, California bush sunflower, laurel sumac, sugarbush, and white sage. Non-native species include: ripgut grass and shortpod mustard.

5.3.13 Disturbed California Sagebrush Scrub

Disturbed California Sagebrush Scrub areas are those devoid of vegetation (cleared or graded) such as dirt roads or those with a high percentage of non-native weedy species (i.e., greater than 25 percent of the species cover).

Areas with Disturbed California Sagebrush Scrub vegetation is present within 3.41 acres of the Survey Area on the west side of Oos Place where the road turns east. Native plant species found on the Survey Area typical of this vegetation community included: California sagebrush, black sage, and sugarbush. Non-native species include: ripgut grass, tocalote, and shortpod mustard.

5.3.14 Rocky Outcrop

Rocky Outcrop is found within steep slopes and cliffs. Substrates are rocky or skeletal thin gravely soils, including igneous (granitic and volcanic), sedimentary, and metamorphic parent material (Sawyer et. Al. 2009). Lance-leaf Dudleya (*Dudleya lanceolata*) is a characteristic herb for this alliance. Other herbs include bromes (*Bromus* spp.), clarkia (*Clarkia* spp.), forget-me-notes (*Crypthantha* spp.), seaside daisy (*Erigeron glaucus*), seaside buckwheat (*Eriogonum latifolium*), fescue (*Festuca* spp.), bitter root (*Lewisia rediviva*), phacelia (*Phacelia* spp.), and squirreltail fescue (*Vulpia bromoides*). Shrubs may be present at sparse cover, including mountain mahogany (*Cercocarpus montanus var. glaber*), sticky monkeyflower, buckwheat (*Eriogonum* spp.), and toyon. Moss and lichen are often well developed.

Areas with Rocky Outcrop vegetation are present within 1.10 acres of the Survey Area on the south side of Kewaak Way, and just east of Morning Star Drive. Native plant species found on the Survey Area typical of this vegetation community included: Englemann's prickly-pear (*Opuntia engelmanii*), ashy spike-moss (*Selaginella cinerascens*), Bigelow's spike-moss (*Selaginella bigelovii*), sliver leaf lotus (*Acmispon argophyllus*), and California peony (*Paeonia californica*). Non-native species include: natal grass (*Melinis rubens* subsp*. rubens*) and olive (*Olea europaea*).

5.3.15 California Sycamore - Coast Live Oak Riparian Woodlands

California Sycamore - Coast Live Oak Riparian Woodland is found in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. Soils are rocky or cobbly alluvium with permanent moisture at depth (Sawyer et al. 2009). The USFWS Wetland Inventory (2024a) recognizes California sycamore as a FACW plant. California sycamore and/or coast live oak is dominant or co-dominant in the tree canopy, often with white alder (*Alnus rhombifolia*), black walnut, Fremont cottonwood (*Populus fremontii*), valley oak, narrow-leaved willow (*Salix exigua*), black willow (*Salix gooddingii*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), Peruvian pepper tree (*Schinus molle*), and California bay. This alliance has been expanded since the 2009 publication of the Manual of California Vegetation, second edition, to include riparian stands dominated by coast live oak. Coast live oaks are fire-hardy with a thick epidermis, have low flammability and readily sprout after fire. Stands occur in watercourses across the southern California coast, such as in the Santa Monica Mountains (Keeler-Wolf and Evens 2006), along the Santa Clara River drainage (Stillwater Sciences and URS 2007), and in areas further north into Santa Barbara County and the Santa Ynez River area. The shrub layer is open to intermittent with an herbaceous layer that is sparse or grassy (Sawyer et al. 2009).

Areas with California Sycamore - Coast Live Oak Riparian Woodlands vegetation are present within 26.67 acres of the Survey Area along Woods Valley Road, Kewaak Way and in between N Lake Wohlford Road and S Canal Road. Native plant species found on the Survey Area typical of this vegetation community included: California sycamore, London plane (*Platanus hispanica*), red willow, and coast live oak. Non-native species include: ripgut grass and bitter dock (*Rumex obtusifolius*).

5.3.16 <u>Goodding's Willow - Red Willow Riparian Woodland and Forest</u>

Goodding's Willow - Red Willow Riparian Woodland and Forest is found along terraces by large rivers, canyons, along floodplains of streams, seeps, springs, ditches, floodplains, lake edges, low-gradient depositions (Sawyer et al. 2009). Goodding’s willow and/or red willow is dominant or co-dominant in the tree or shrub canopy with boxelder (*Acer negundo*), California buckeye, white alder, incense cedar (*Calocedrus decurrens*), Oregon ash, gray pine, California sycamore, Fremont cottonwood, coast live oak, canyon live oak (*Quercus chrysolepis*), valley oak, Pacific willow (*Salix lucida* var. *lasiandra*) or California fan palm (*Washingtonia filifera*). Shrubs include mule fat (*Baccharis salicifolia*), red twig dogwood (*Cornus sericea*), California rose (*Rosa californica*), Himalayan blackberry (*Rubus armeniacus*), sand bar willow, arroyo willow or blue elderberry (*Sambucus mexicana*). Goodding’s willow and red willow were formerly described and treated as separate alliances, but the two types have been merged since they often occur together and share similar habitats (Sawyer et al. 2009). The tree canopy in this community is open to continuous with a sparse-to- continuous shrub layer and a variable herbaceous layer.

Areas with Goodding's Willow - Red Willow Riparian Woodland and Forest vegetation are present within 3.7 acres of the Survey Area along streams and canals adjacent to roads like S Canal Road and Eshash Road. Native plant species found on the Survey Area typical of this vegetation community included: California sycamore, London plane, red willow, and coast live oak. Non-native species include: ripgut grass and bitter dock.

5.3.17 <u>Cattail Marshes</u>

Cattail Marshes are found in semi-permanently flooded freshwater or brackish marshes. Soils in this community are typically clayey or silty (Sawyer et al. 2009). The USFWS Wetland Inventory (2024a) recognizes narrow leaf cattail (*Typha angustifolia*), Slender cattail (*Typha domingensis*), and broadleaf cattail (*Typha latifolia*) as OBL plants. Slender cattail, narrow leaf cattail, or broadleaf cattail is dominant or co-dominant in the herbaceous layer with sedge (*Cyperus* spp.), salt grass (*Distichlis spicata*), barnyard grass (*Echinochloa crus-galli*), rushes (*Juncus* spp.), common reed (*Phragmites australis*), Chairmaker's bulrush (*Schoenoplectus americanus*), California bulrush (*Schoenoplectus californicus*), and rough cocklebur (*Xanthium strumarium*). Emergent trees may be present at low cover, including willows (*Salix* spp.) and herbs are less than 1.5 meters tall. Cover in this community is intermittent to continuous.

Areas with Cattail Marsh vegetation are present within 0.32 acres of the Survey Area east of N Lake Wohlford Road and south of Armstrong Ranch Road. Native plant species found on the Survey Area typical of this vegetation community included: broad-leaved cattail. Non-native species include: ripgut grass.

5.3.18 <u>Mulefat Thicket</u>

Mulefat Thickets are found within Canyon bottoms, floodplains, irrigation ditches, lake margins, stream channels (Sawyer et al. 2009). Soils within this community are typically mixed alluvium. The USFWS Wetland Inventory (2024a) recognizes mulefat as a Facultative Wetland (FACW) plant. Mulefat is dominant or co-dominant in the shrub canopy with California sagebrush *,* willow baccharis (*Baccharis emoryi*), coyote bush, laurel sumac, tree tobacco (*Nicotiana glauca*), arrow weed (*Pluchea sericea*), *Rubus* spp., sandbar willow, arroyo willow, blue elderberry *and Tamarix* spp. Emergent trees may be present at low cover, including grey pine, California sycamore, Fremont cottonwood, *Quercus* spp. or *Salix* spp. The alliance occurs in both seasonally or intermittently flooded habitats, and stands are inherently variable depending on the amount of inundation and scouring. Stands usually form open shrublands or thickets in riparian corridors and along lake margins. They are especially common in southern California. Shrubs in this community are generally less than 5 m with a continuous canopy with two tiers at less than 2 m and less than 5 m with a sparse herbaceous layer (Sawyer et al. 2009).

Mulefat Thickets are present within 0.06 acres of the Survey Area east of S San Pasqual Road and north of Kumeyaay Way. Native plant species found on the Survey Area typical of this vegetation community included: mulefat, red willow, wild cucumber (*Marah macrocarpa*), and smooth mountain-mahogany (*Cercocarpus minutiflorus)*. Non-native species include: ripgut grass and giant reed.

5.3.19 <u>Ornamental Landscaping</u>

Ornamental Landscaping includes areas where the vegetation is dominated by non-native horticultural plants (Gray and Bramlet 1992). Typically, the species composition consists of introduced trees, shrubs, flowers and turf grass.

There are 64.54 acres of Ornamental Landscaping in the Survey Area. Ornamental Landscaping is present within the project adjacent to Developed areas. Plant species found on the Survey Area typical of this community include: California buckwheat, chamise, tamarisk (*Tamarix chinensis*), Italian cypress (*Cupressus sempervirens*), Brazilian pepper tree (*Schinus terebinthifolius*), and iceplant (*Carpobrotus* sp.).

5.3.20 <u>Developed</u>

Developed areas are areas that have been altered by humans and now display man-made structures such as houses, paved roads, buildings, parks, and other maintained areas.

Developed areas are present throughout the Survey Area. There are 174.28 acres of Developed areas in the Survey Area.

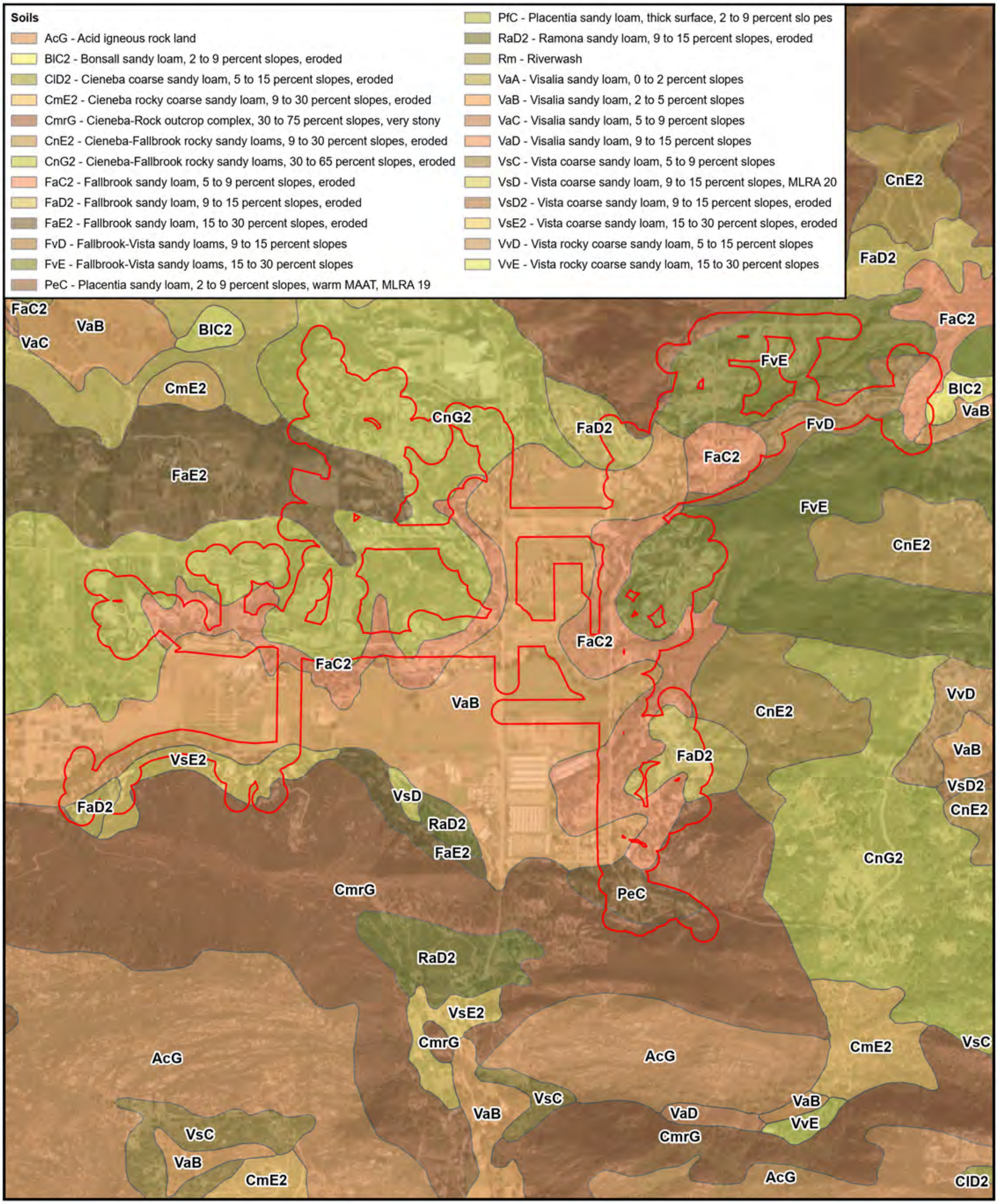
5.3.21 Bare Ground

Bare Ground areas are present within the project intermittent within developed areas. There are 13.64 acres of Bare Ground areas in the Survey Area.

5.3.22 Ruderal

Areas classified as Ruderal tend to be dominated by pioneering herbaceous species that readily colonize disturbed ground and that are typically found in temporary, often frequently disturbed habitats (Barbour et al. 1999). The soils in ruderal areas are typically characterized as heavily compacted or frequently disturbed. The vegetation in these areas is adapted to living in compact soils where water does not readily penetrate the soil. Often, Ruderal areas are dominated by species of the *Centaurea*, *Brassica*, *Malva*, *Salsola*, *Eremocarpus, Amaranthus*, and *Atriplex* genera.

There are 104.58 acres of Ruderal Vegetation in the Survey Area. Areas with Ruderal vegetation are present throughout the Survey Area intermittent within, and adjacent to Developed areas. Ruderal plant species found on the Survey Area include: Romona lilac, goldenbush (*Hazardia squarosa*), and shortpod mustard.



Survey Area

N

0 700 1,400 2,800

Feet

Figure 2
San Pasqual Community Sewer
Soils

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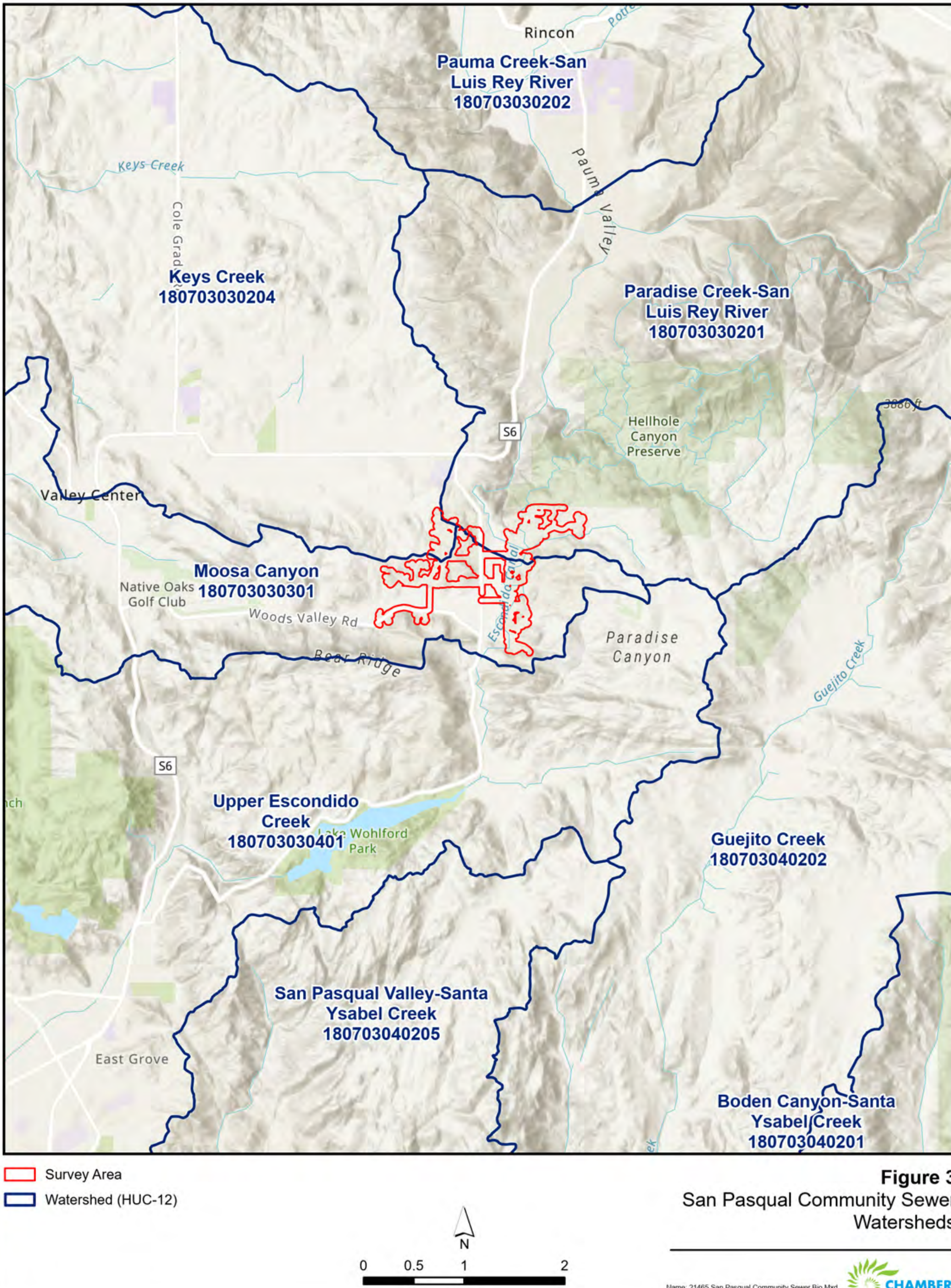

Figure 3
San Pasqual Community Sewer
Watersheds

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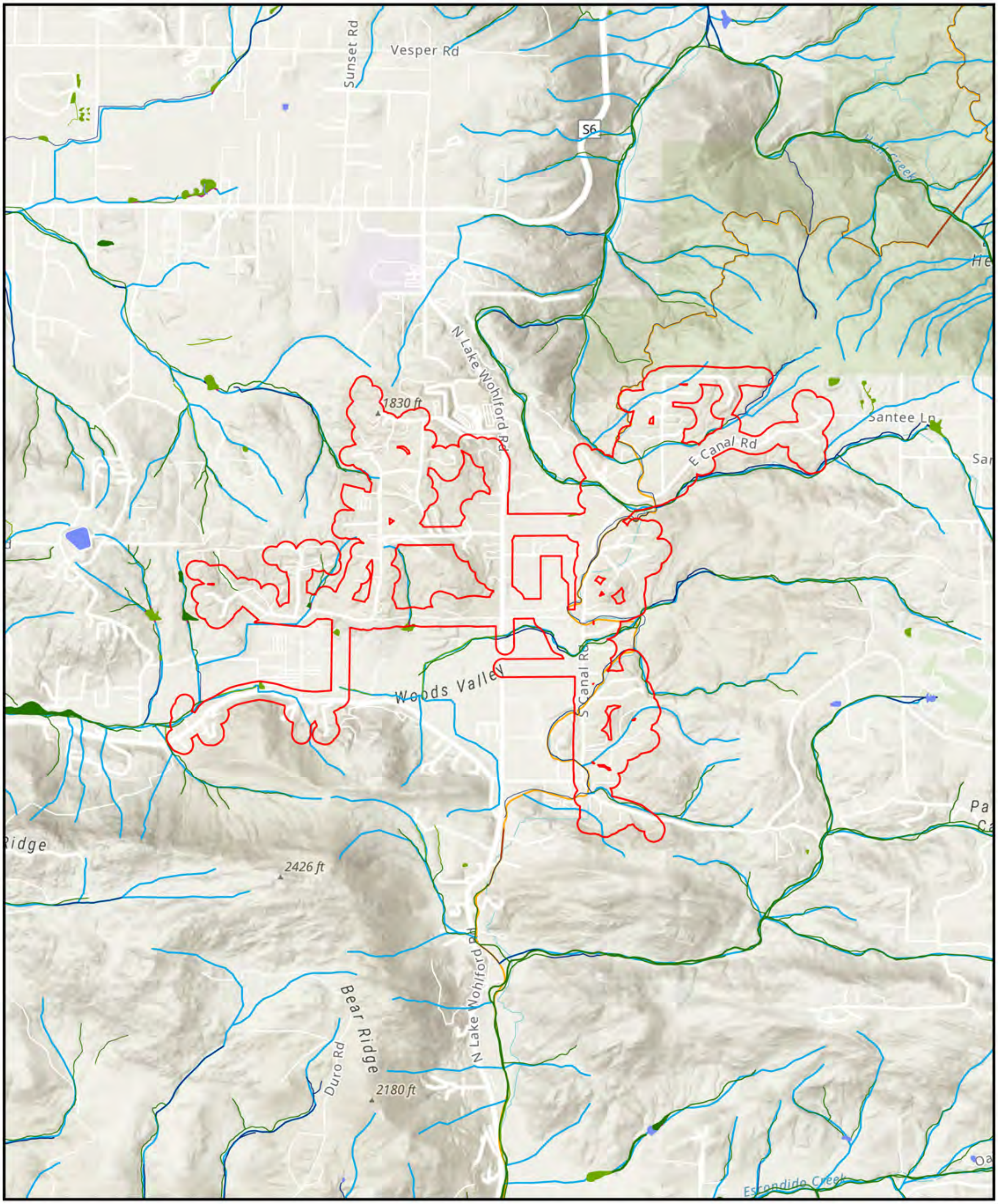

Survey Area

NHD

CanalDitch

Pipeline

StreamRiver

ArtificialPath

NWI

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Riverine

N

0 800 1,600 3,200

Feet

Figure 4
San Pasqual Community Sewer
NWI and NHD

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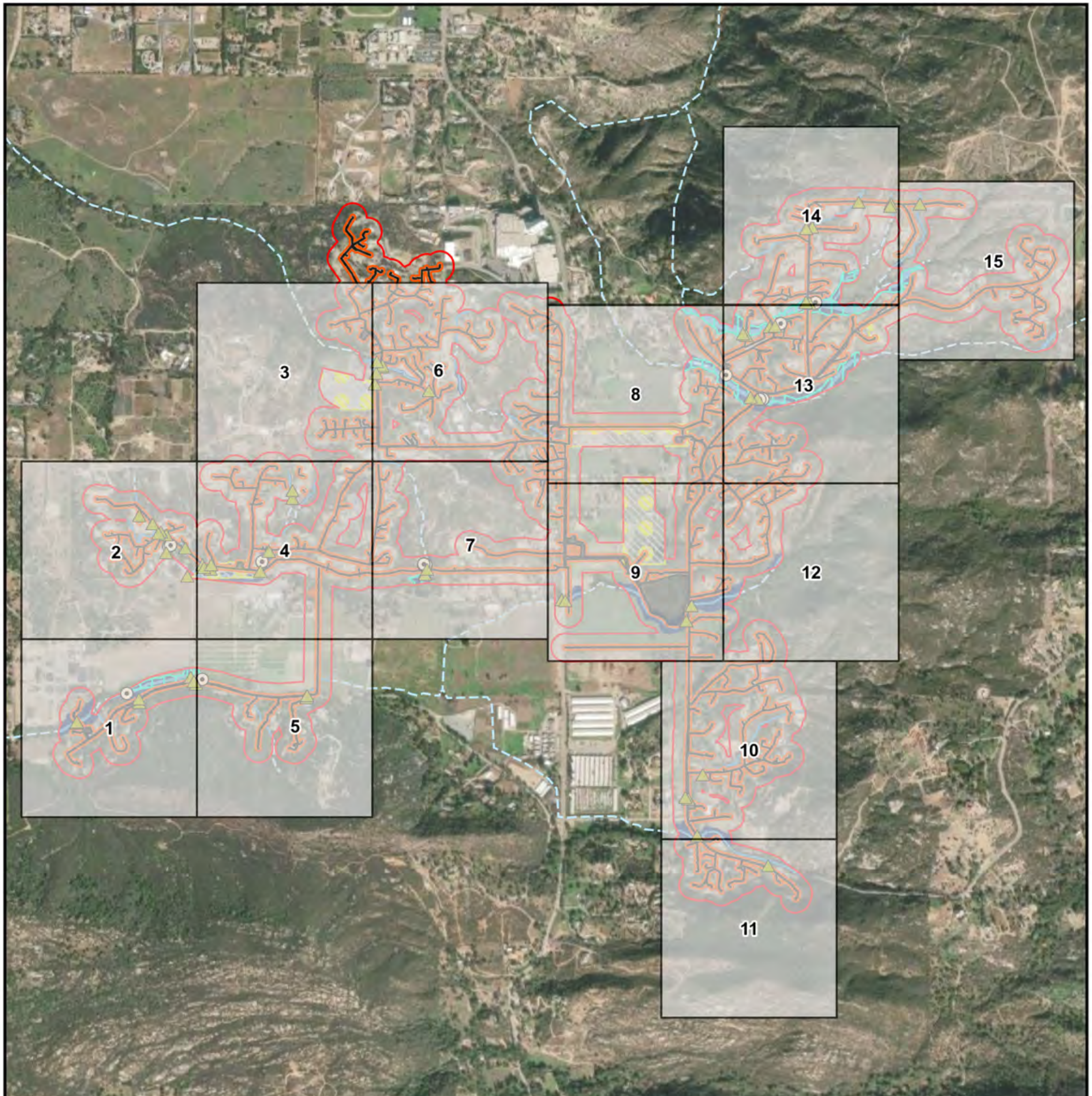
Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
OVERVIEW



- Survey Area
- Action Area
- Staging Areas
- Permanent Impact
- Temporary Impact
- Culvert
- Soil Pit
- Stream
- Topographical Depression
- Wetland
- Bank to Bank
- Ordinary High Water Mark

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Feet

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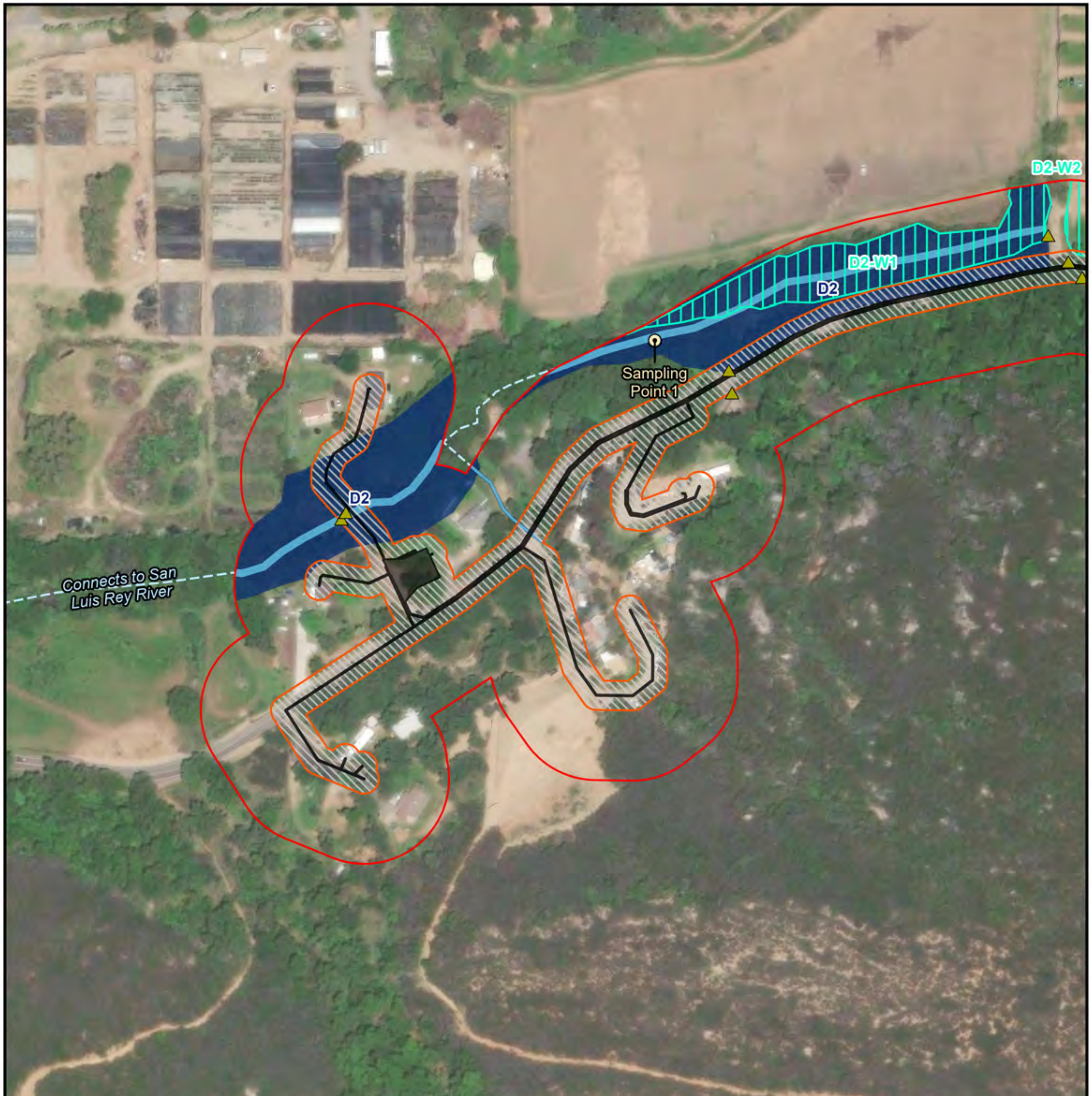

Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 1 of 15

- Survey Area
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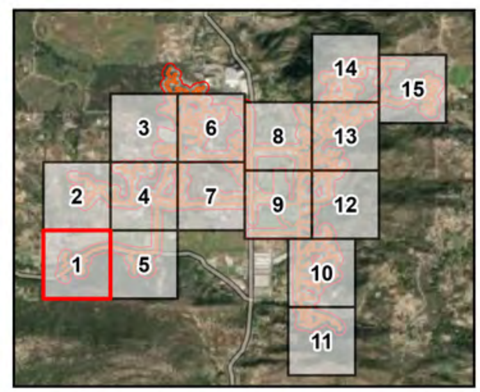

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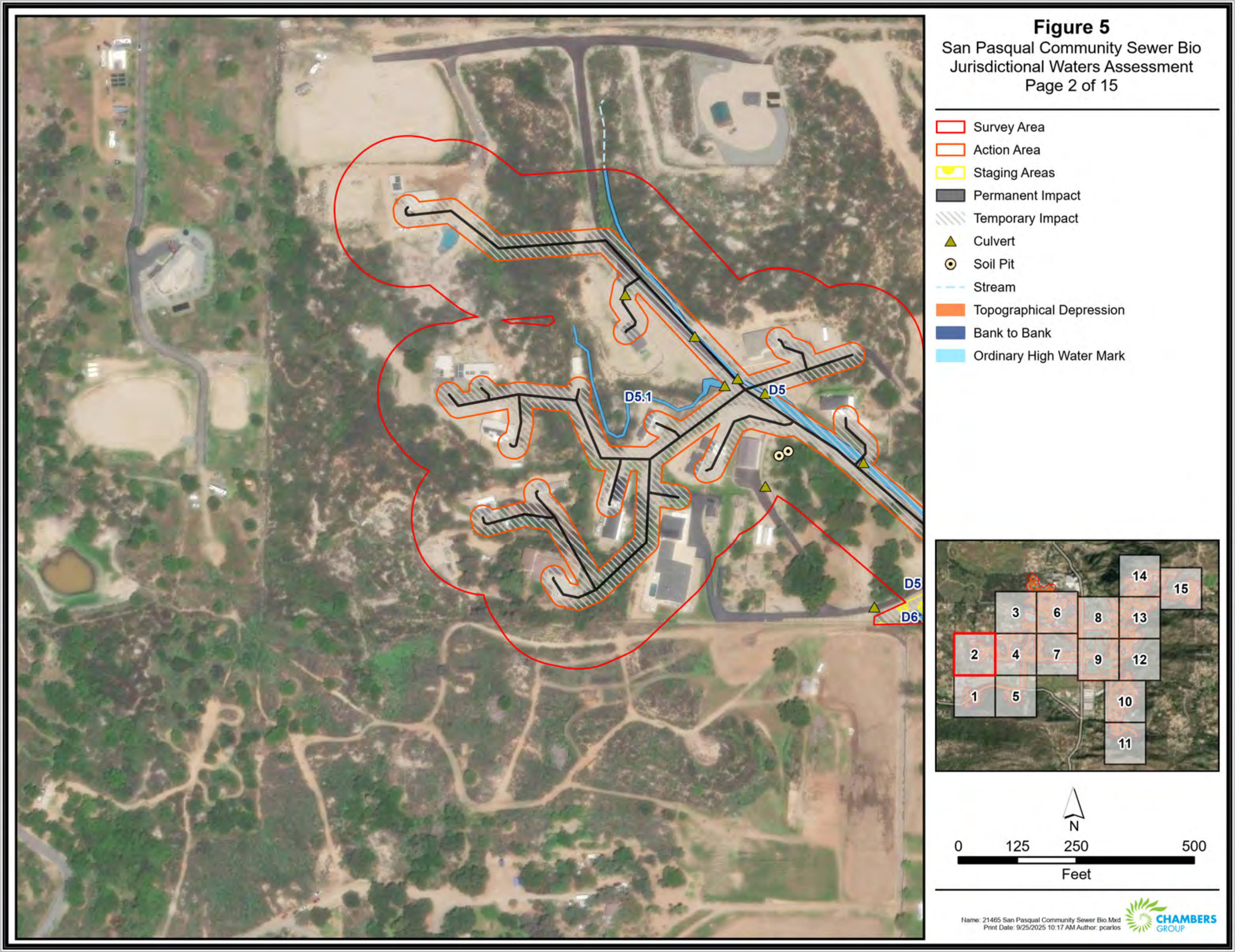

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Figure 5
San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 2 of 15
Survey Area
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Bank to Bank
Ordinary High Water Mark
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Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
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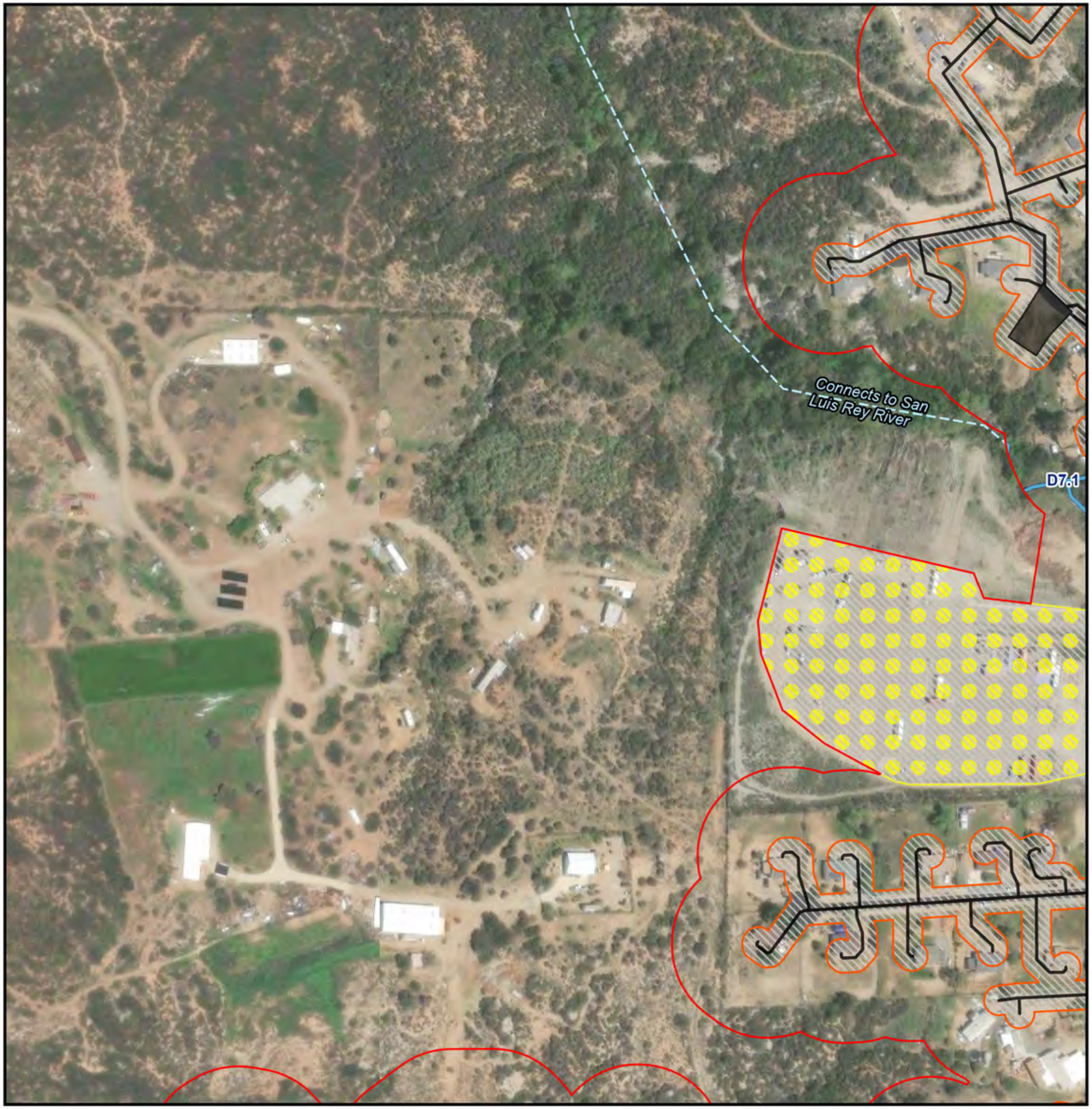

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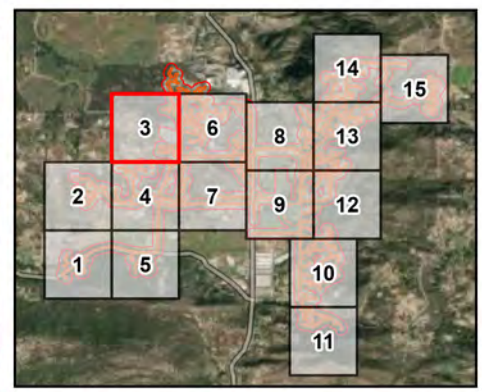

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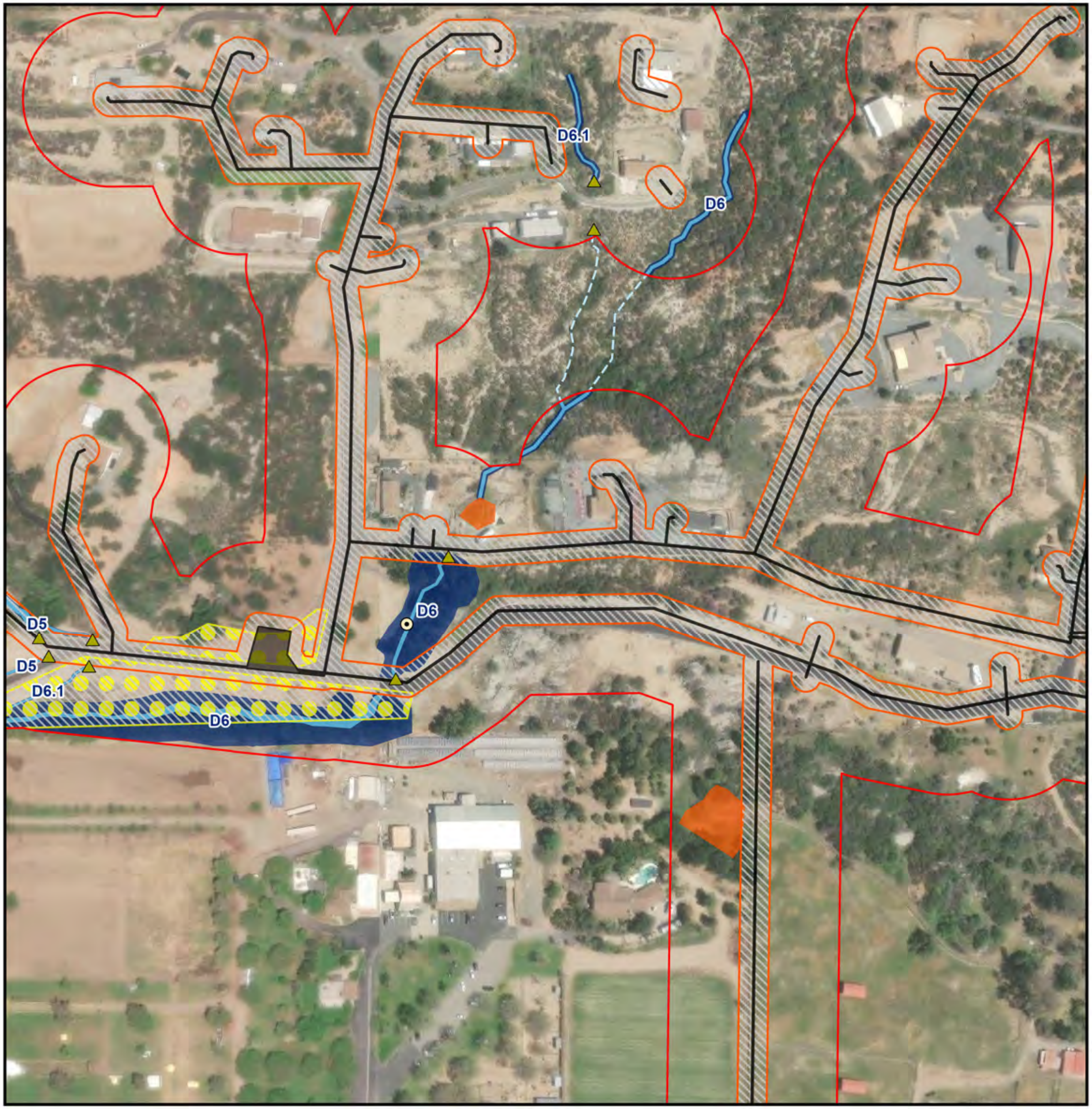
Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment



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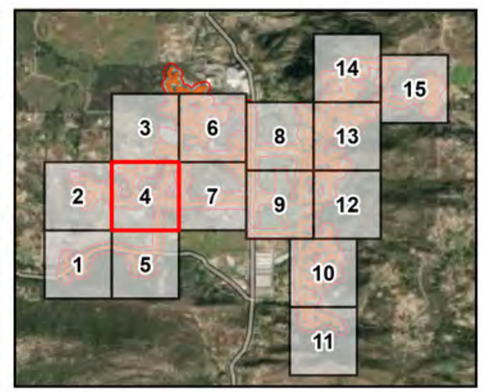

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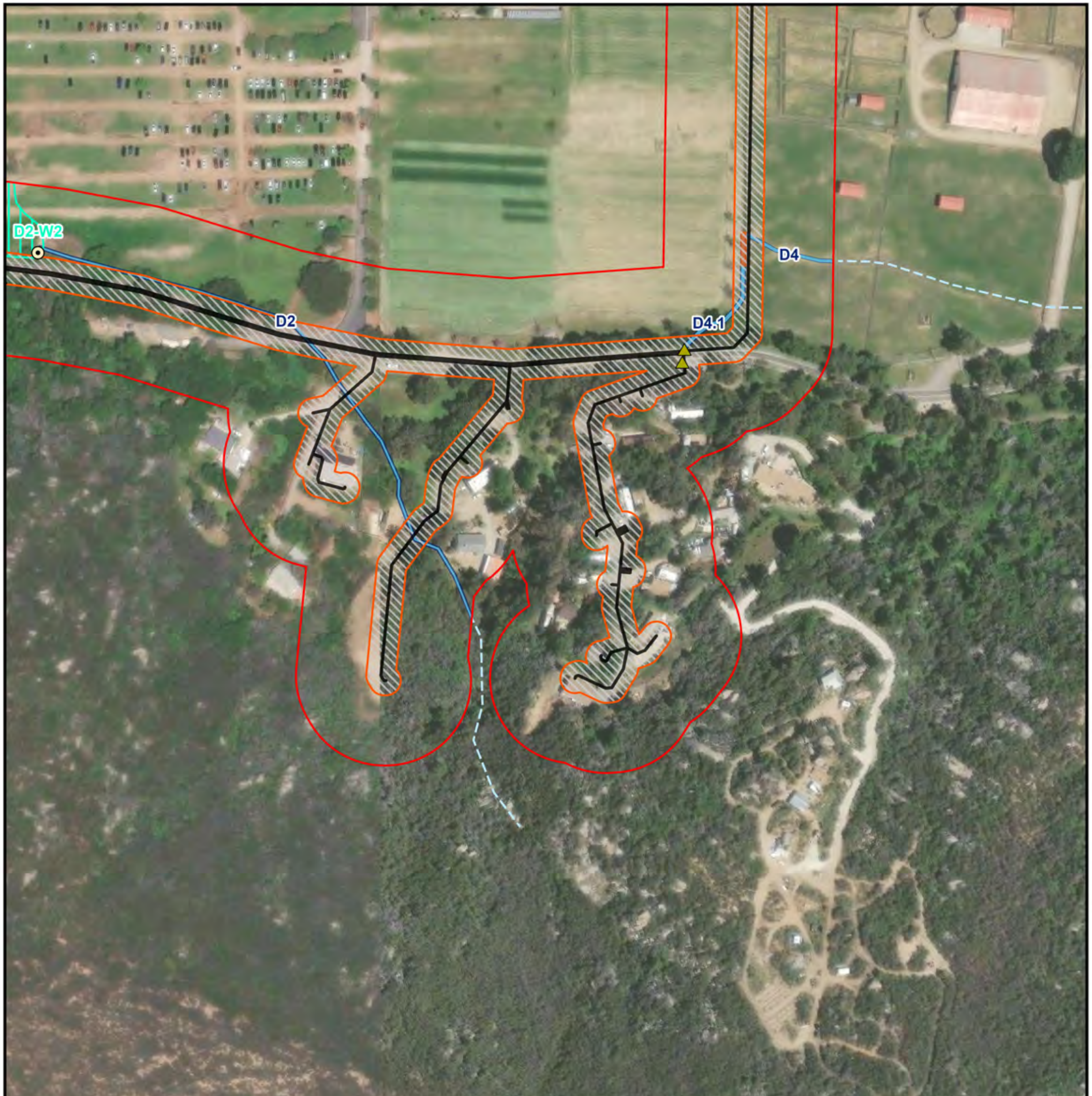
Figure 5

San Pasqual Community Sewer Bio Jurisdictional Waters Assessment
Page 5 of 15



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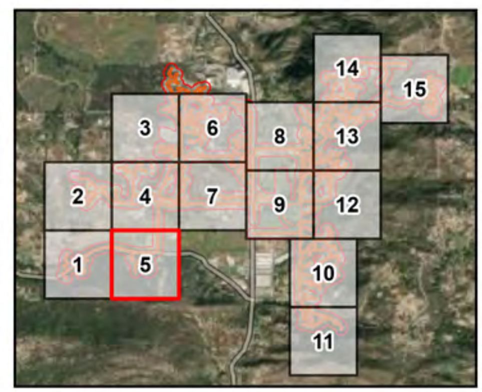

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Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
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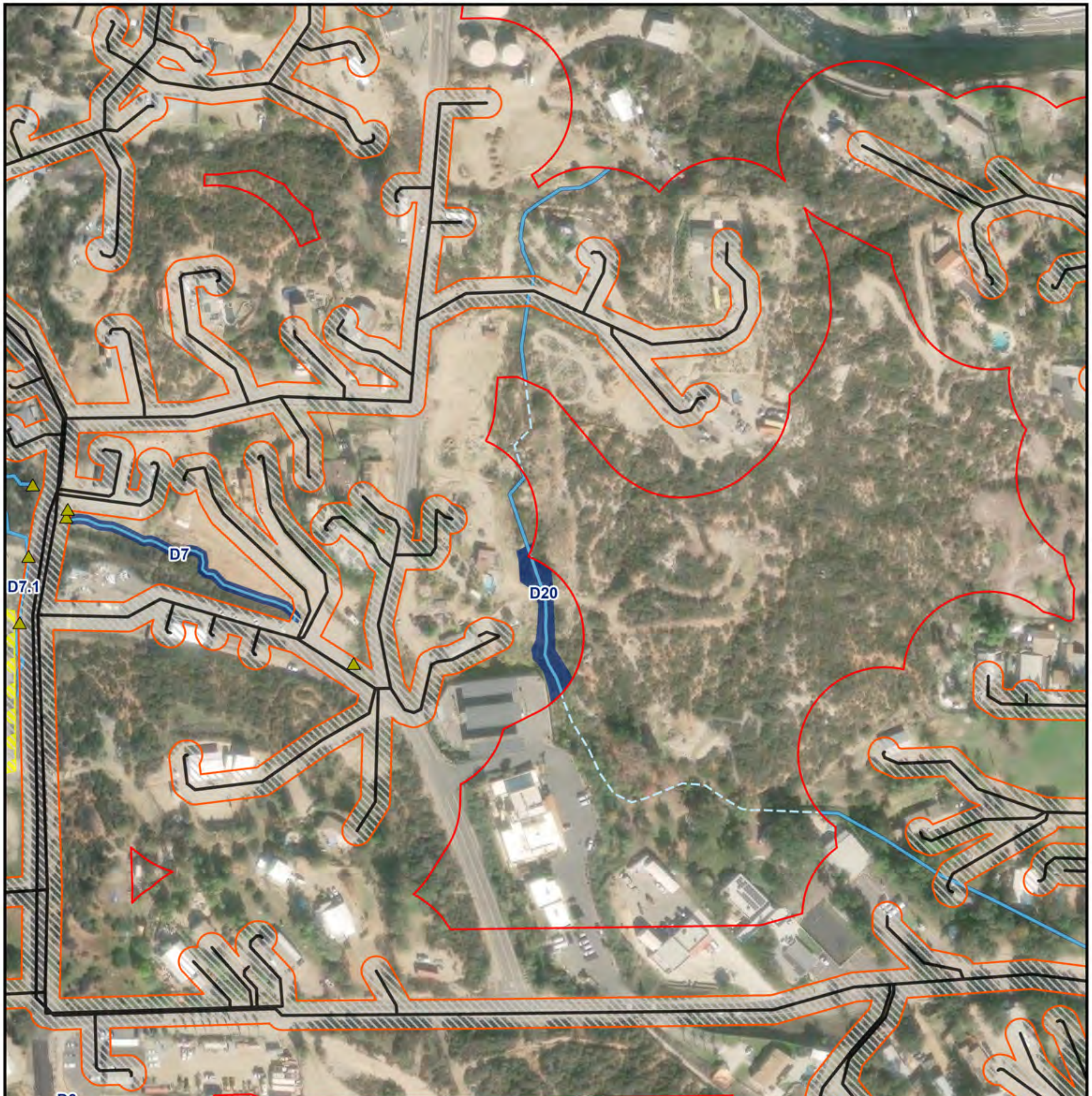

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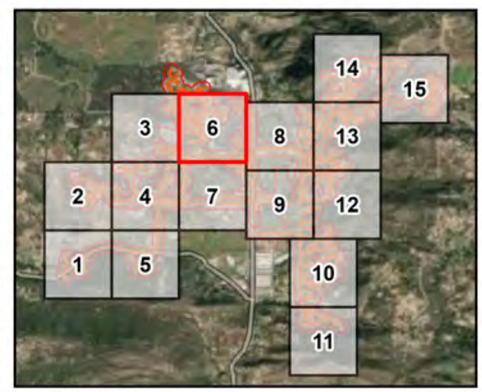

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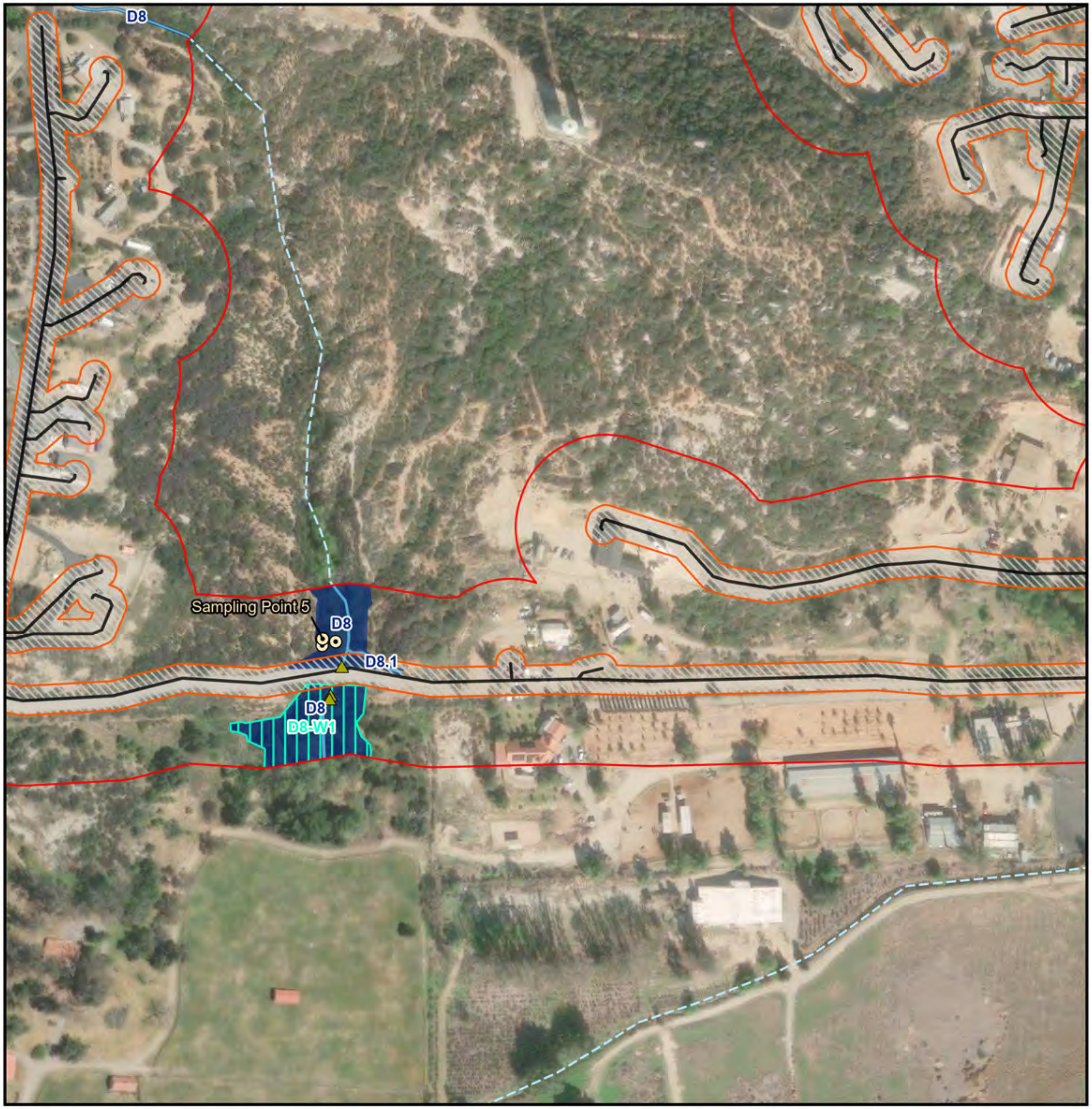
Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 7 of 15



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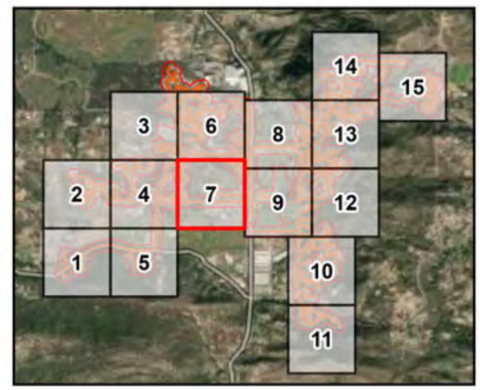

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Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
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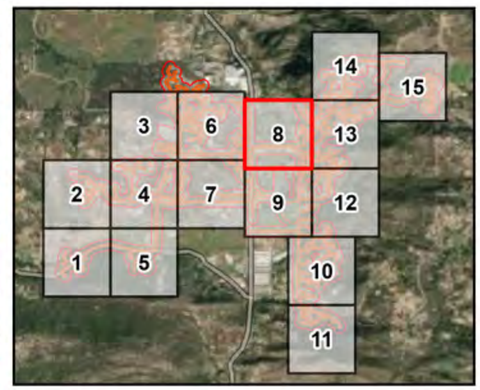

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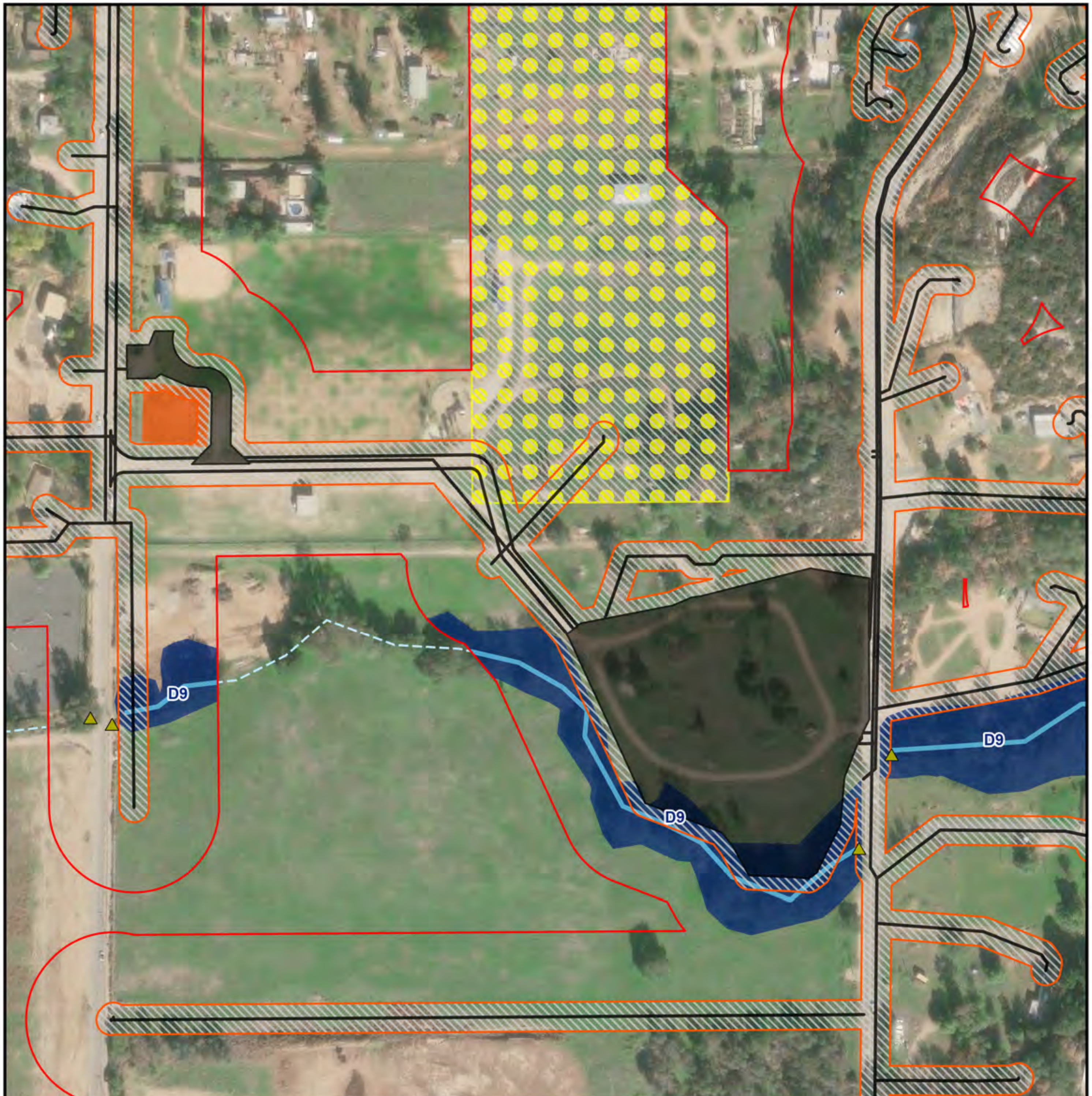

Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment

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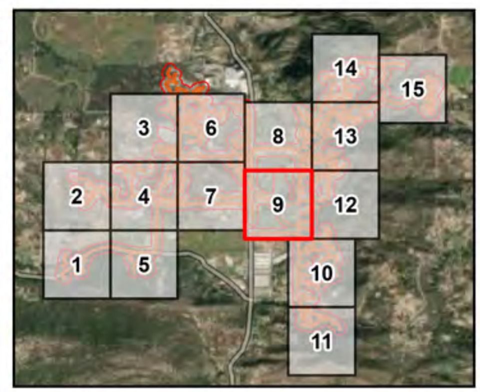

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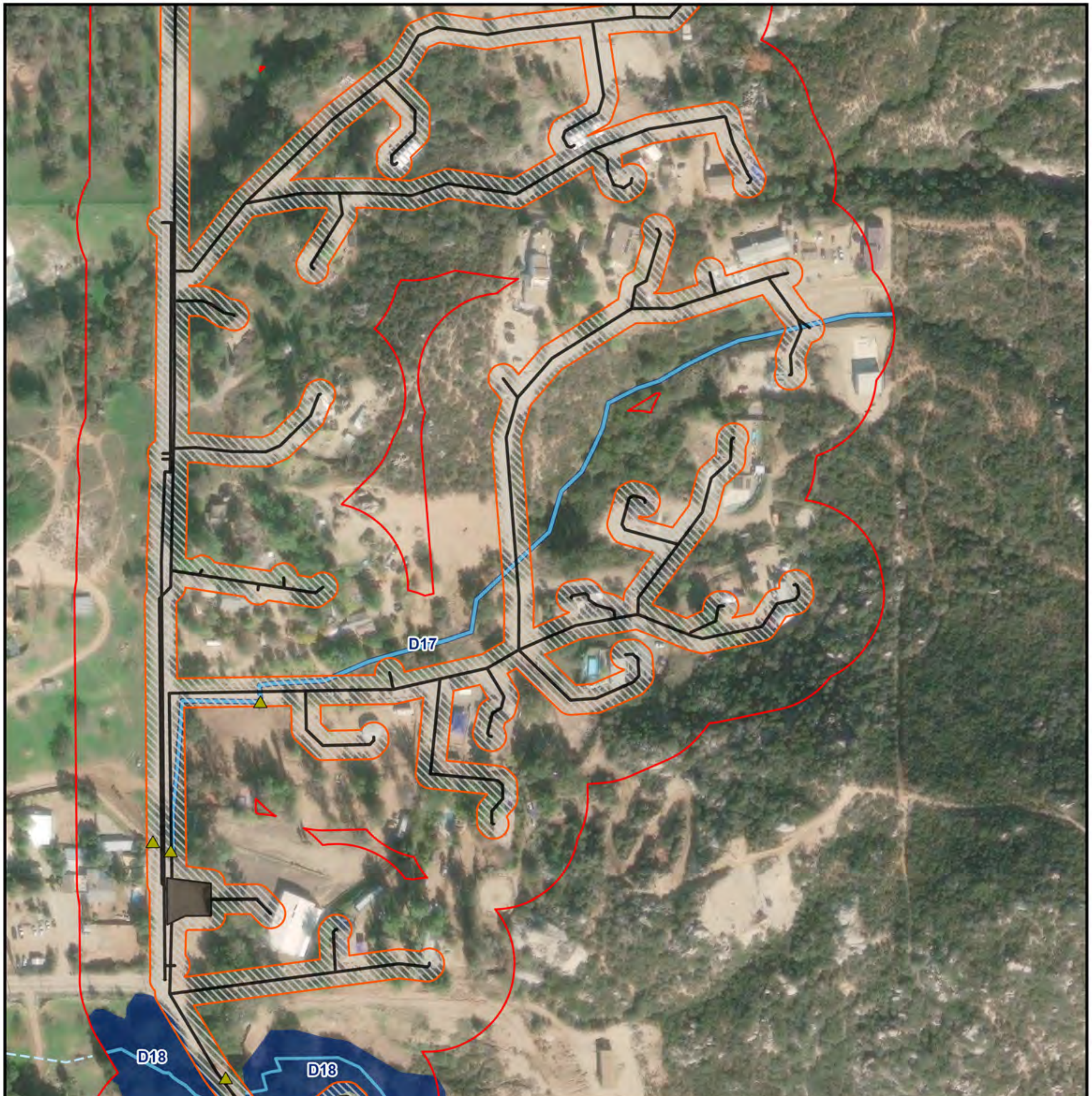
Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 10 of 15



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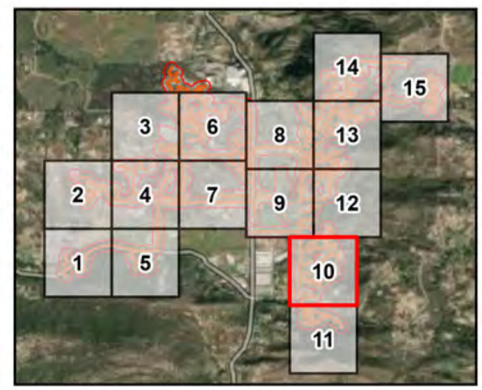

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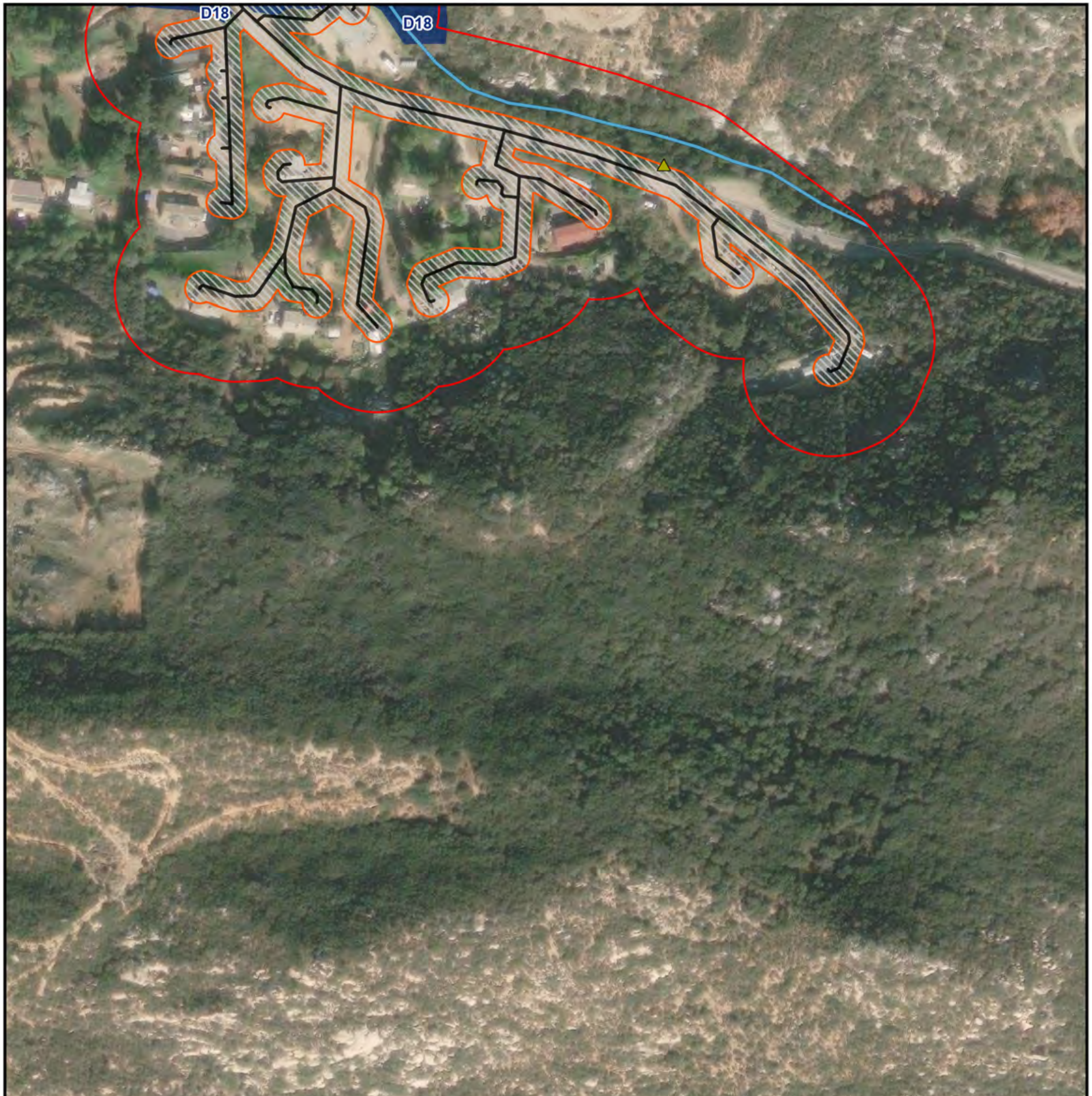

Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 11 of 15

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- Culvert
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- Ordinary High Water Mark

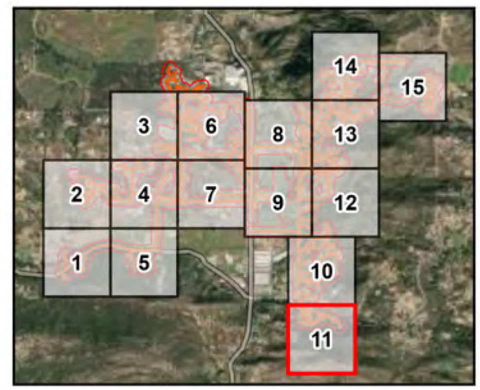

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Figure 5
San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
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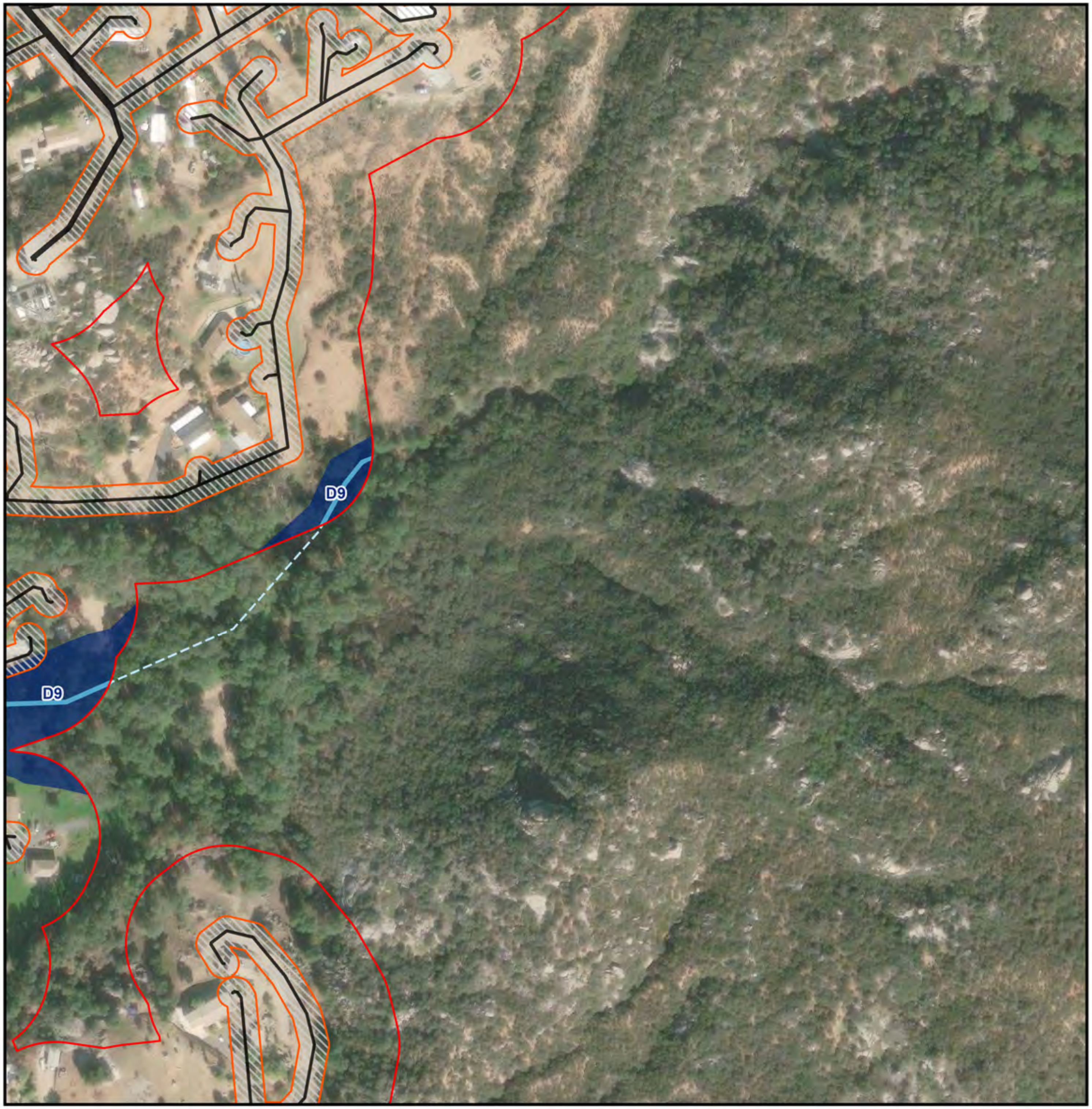

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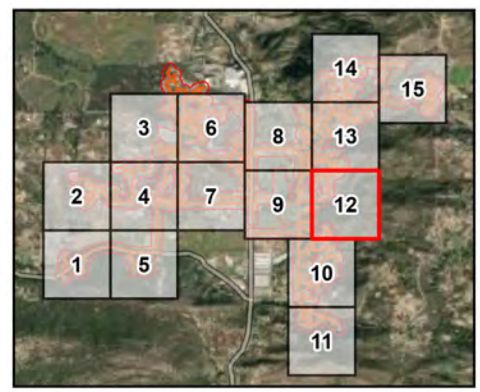

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Figure 5

San Pasqual Community Sewer Bio Jurisdictional Waters Assessment

- Survey Area
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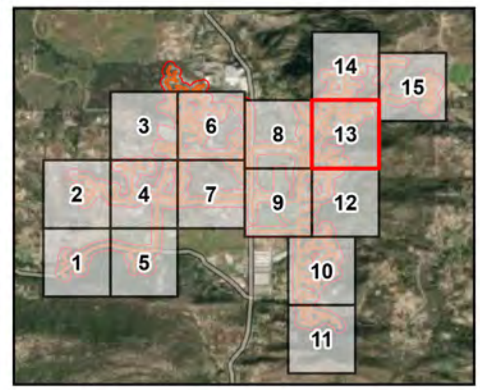

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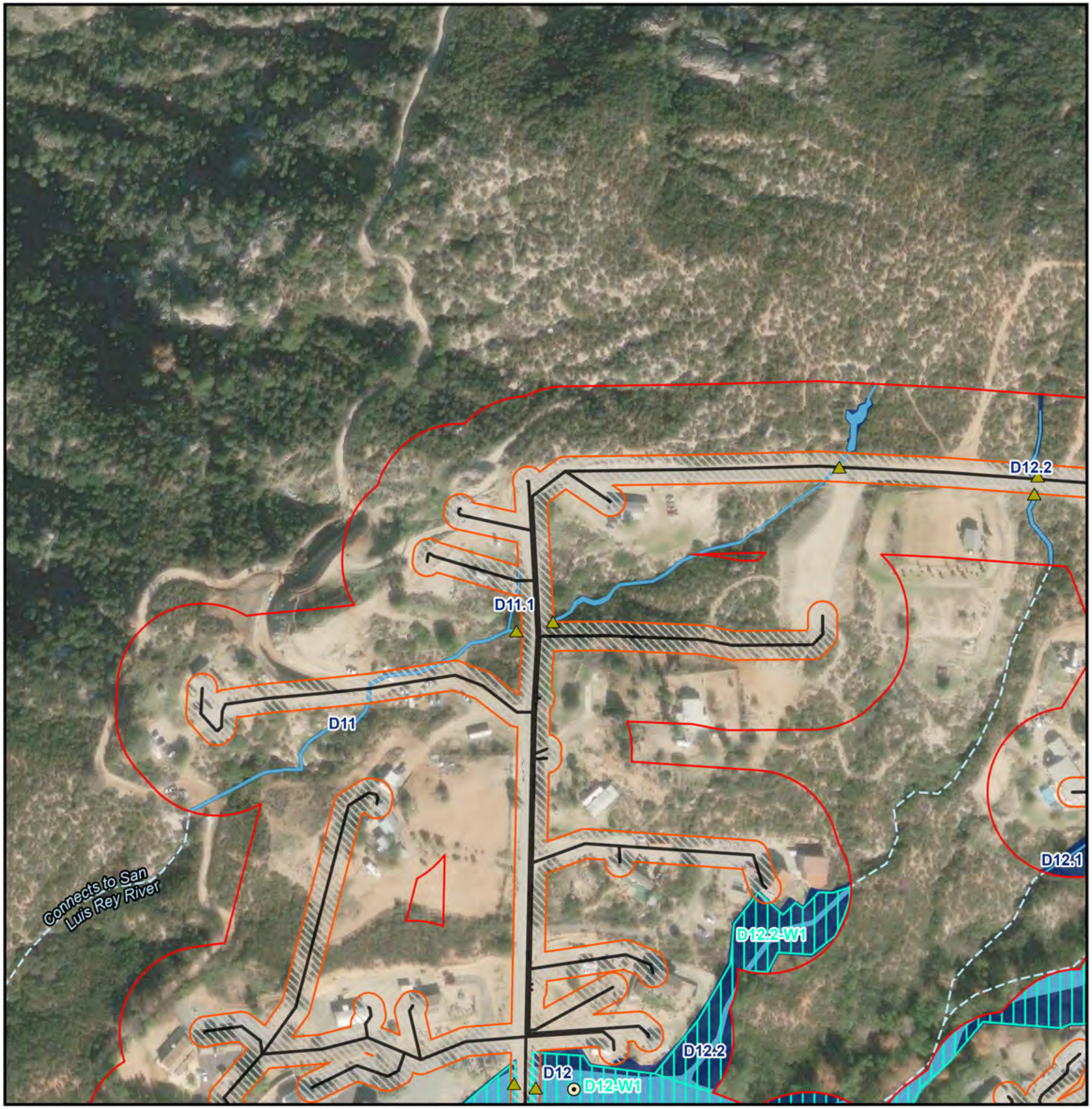

Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
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- Survey Area
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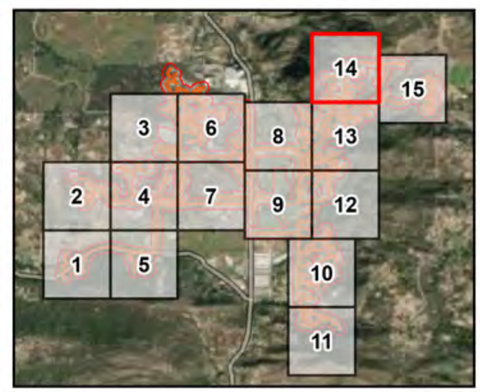

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Figure 5

San Pasqual Community Sewer Bio
Jurisdictional Waters Assessment
Page 15 of 15

- Survey Area
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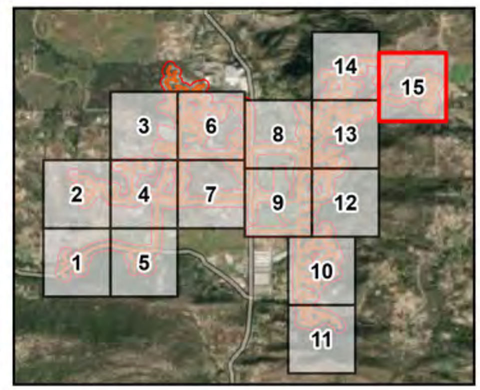

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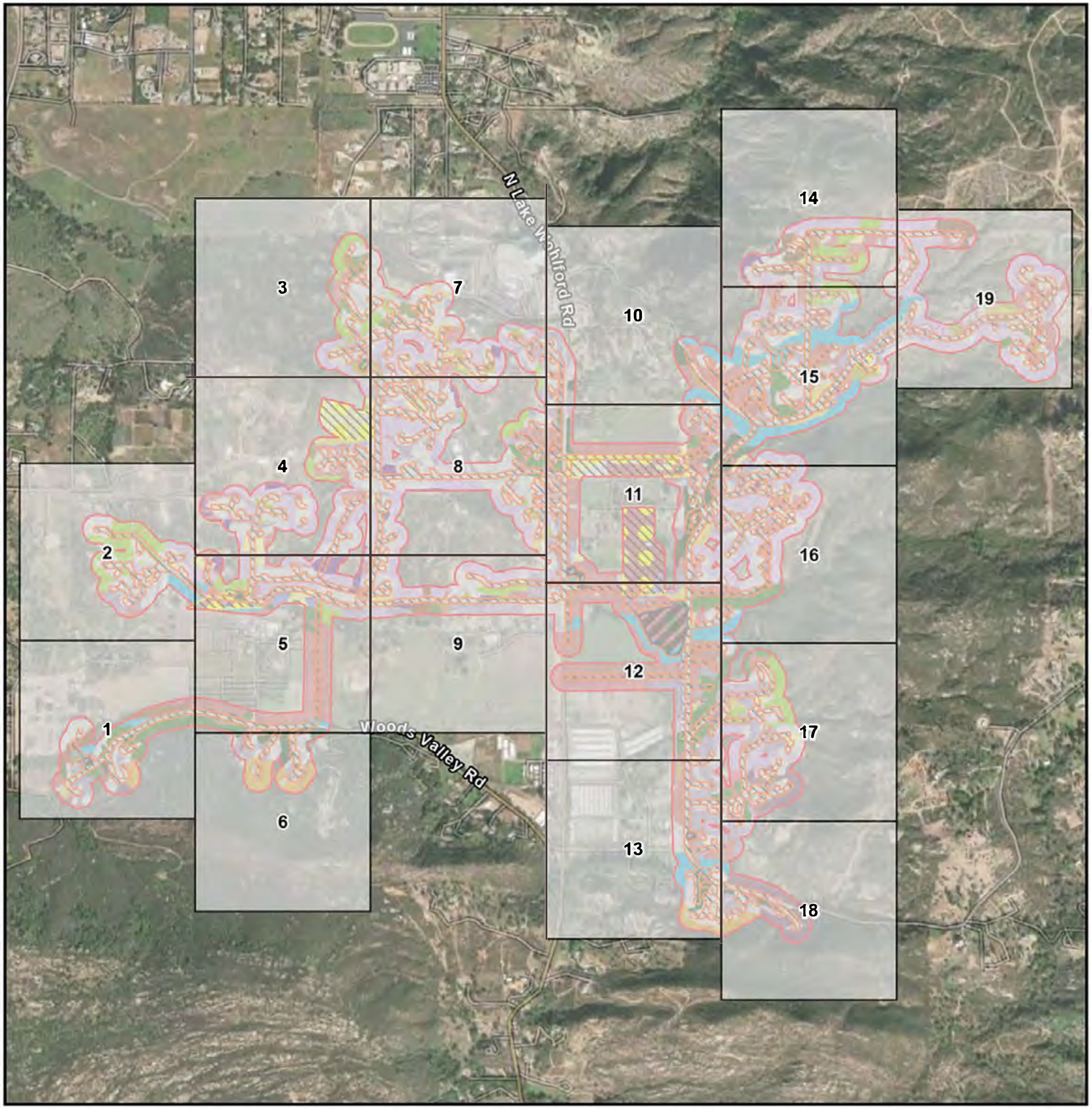
Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
OVERVIEW



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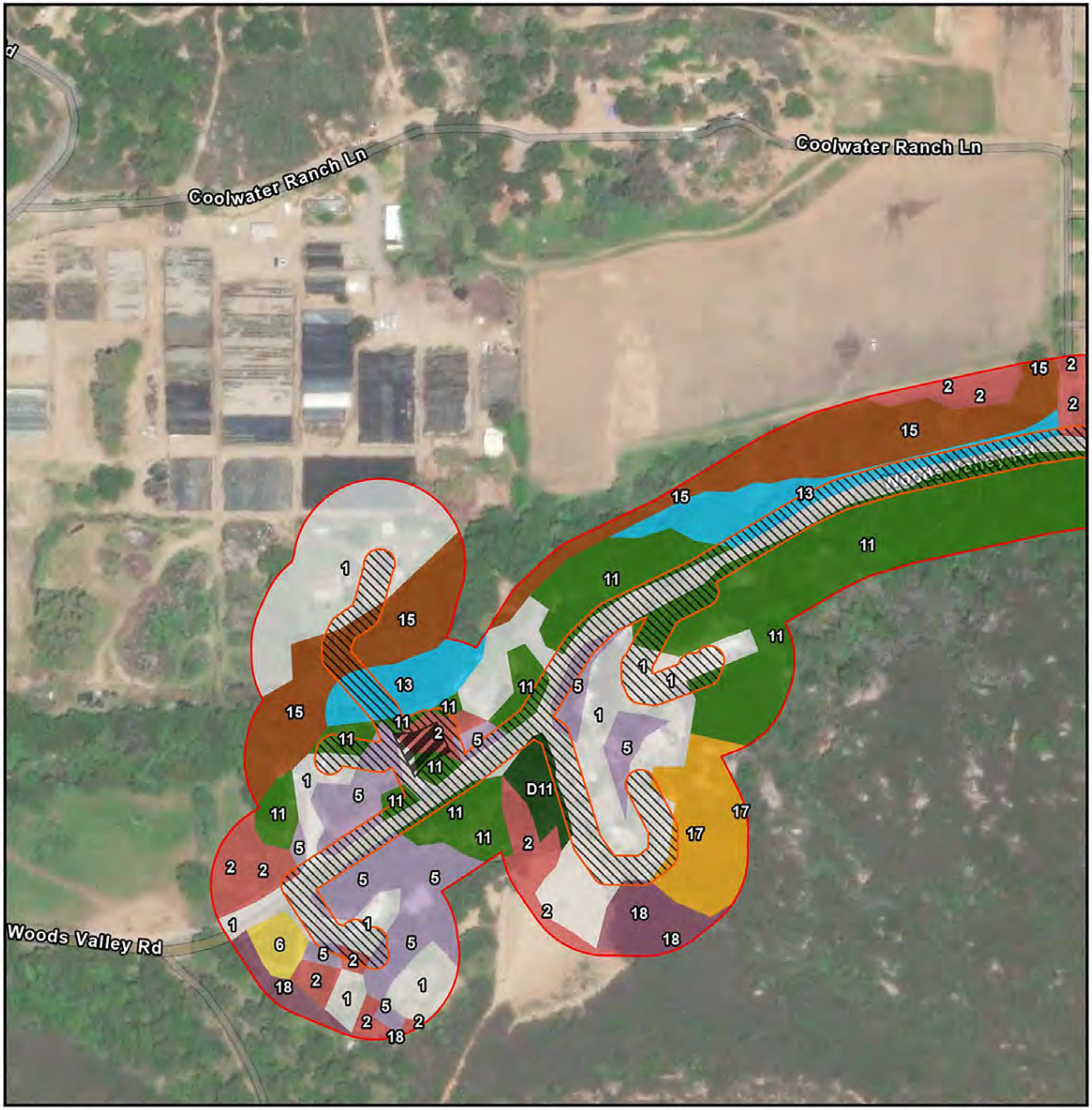
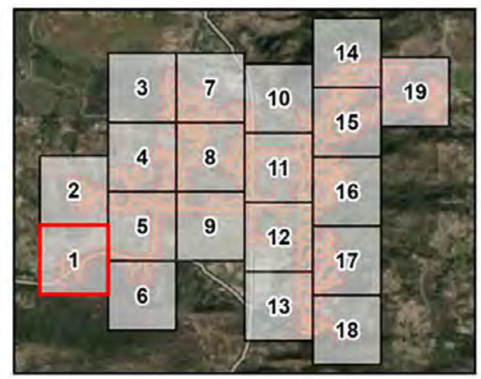


Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities
Page 1 of 19

- Survey Area
- Action Area
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 15. Gooding's Willow - Red Willow Riparian Woodland
- 17. Hoary Leaf Ceanothus Chaparral
- 18. Scrub Oak Chaparral



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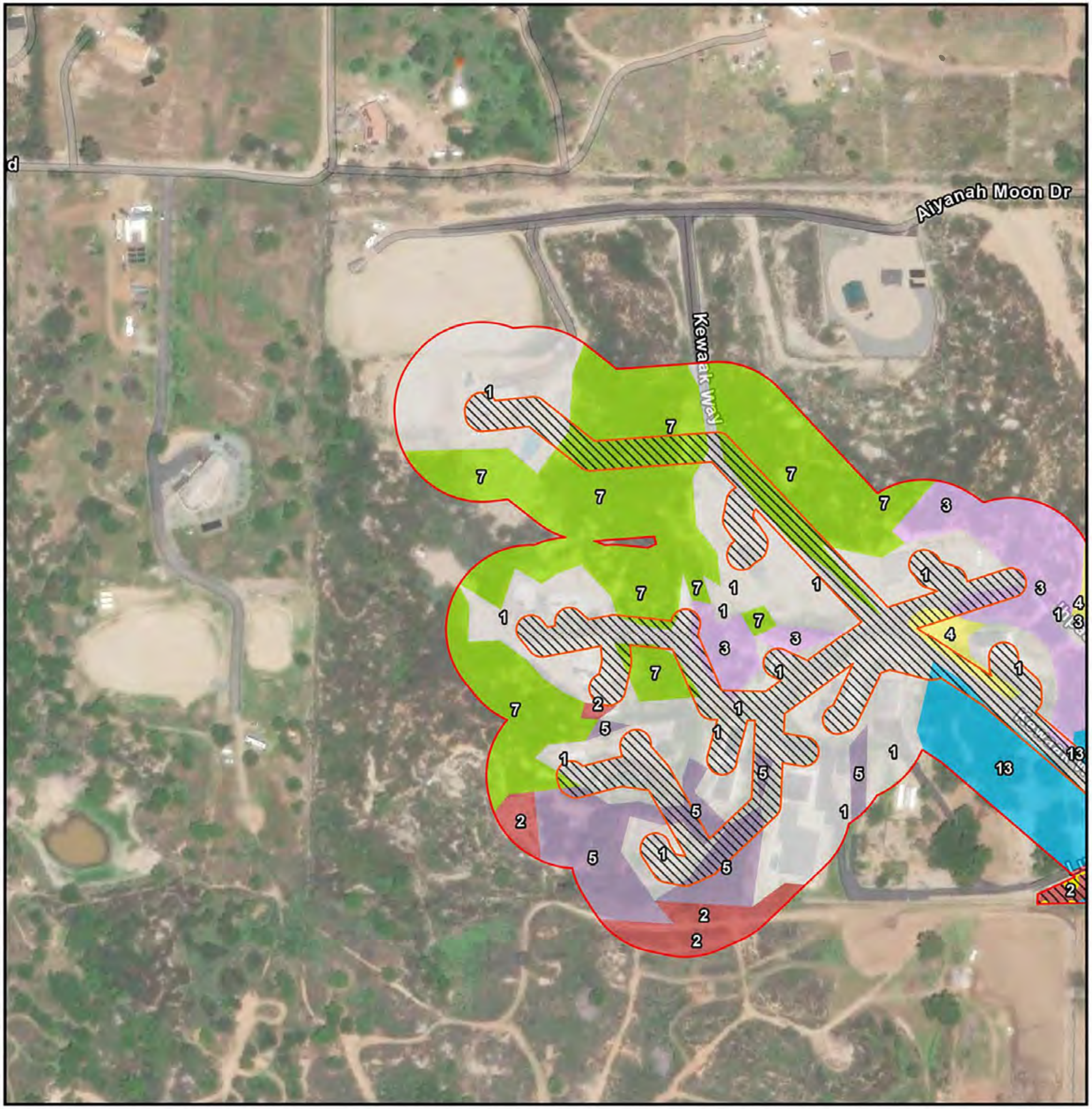

Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 2 of 19

- Survey Area
- Action Area
- Staging Areas
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 7. Laurel Sumac Scrub
- 13. California Sycamore - Coast Live Oak Riparian Woodland

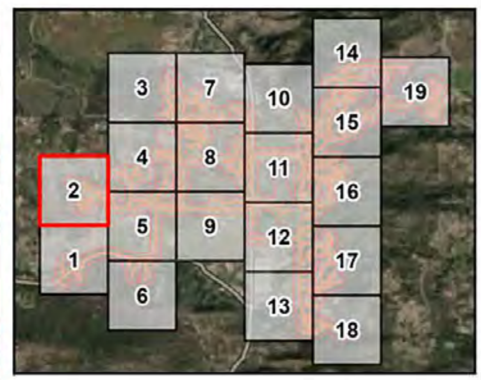

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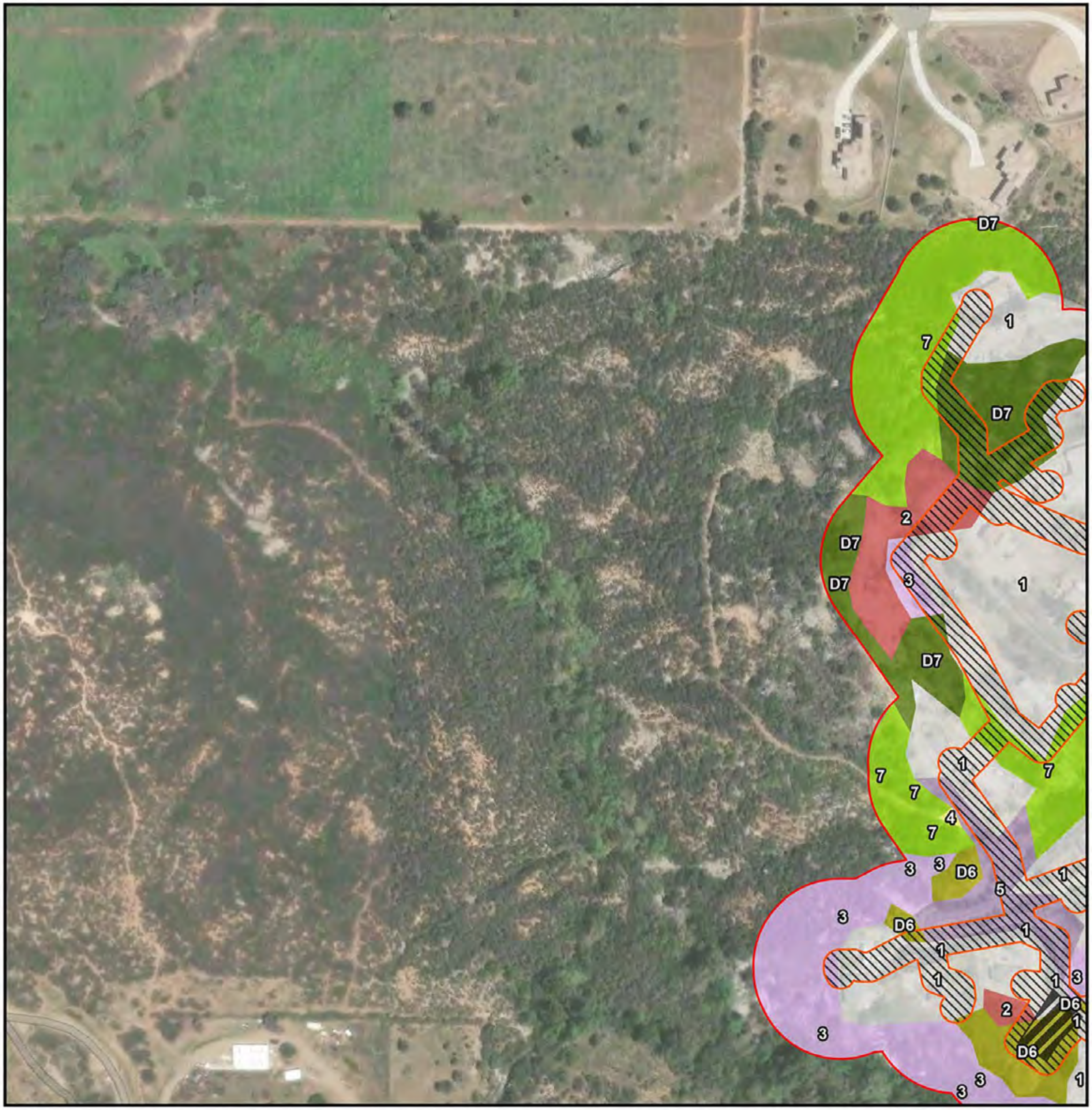
Figure 6a

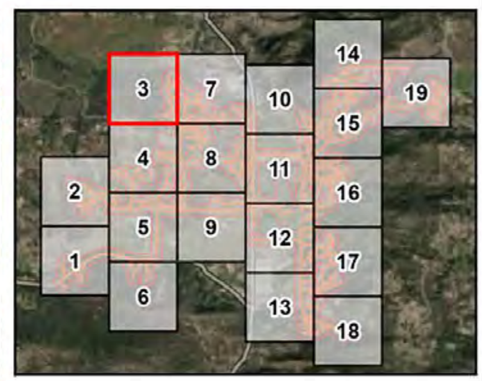
San Pasqual Community Sewer Bio
Vegetation Communities

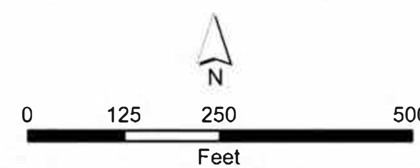


- Survey Area
- Action Area
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- D7. Disturbed Laurel Sumac Scrub





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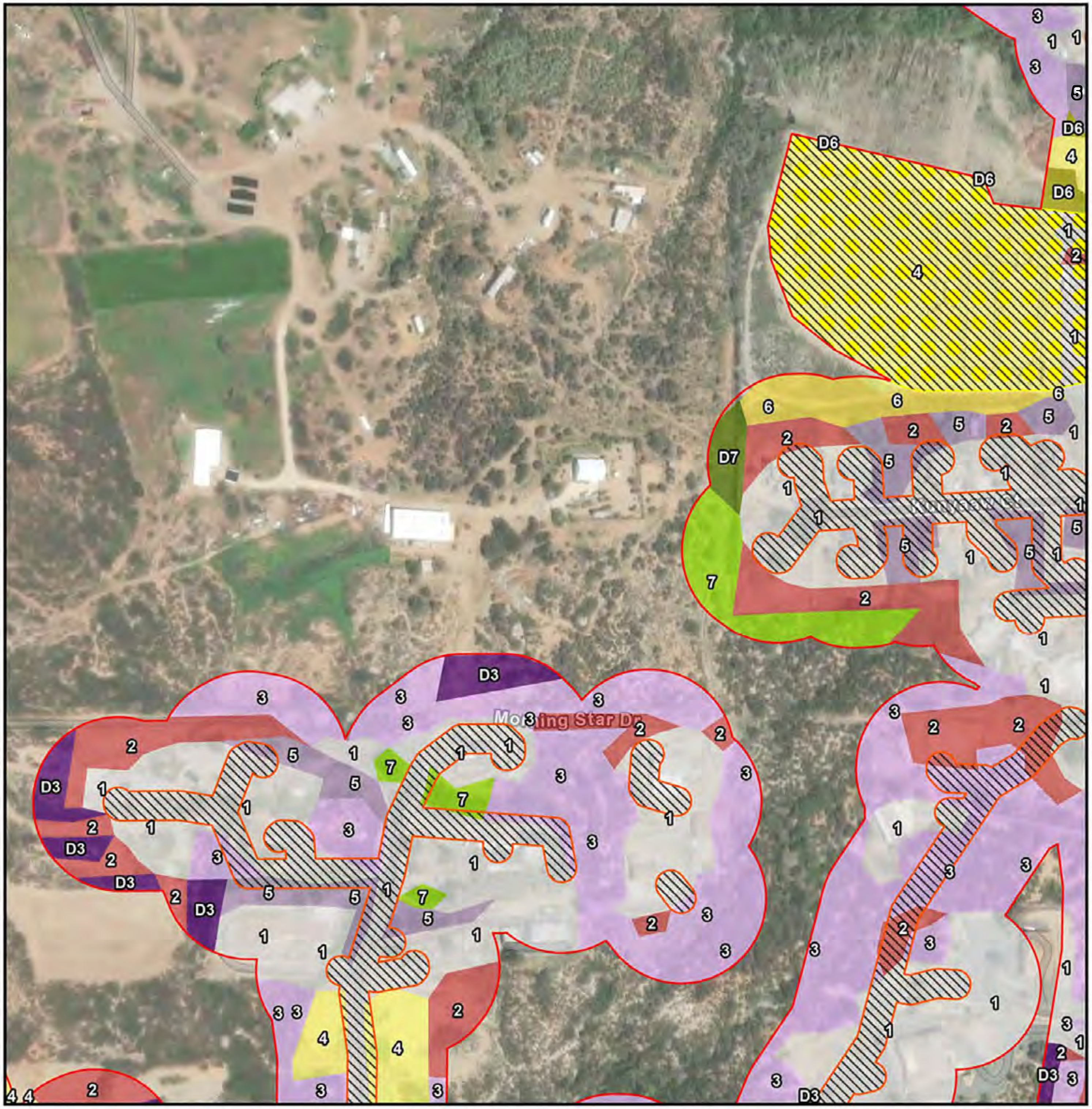


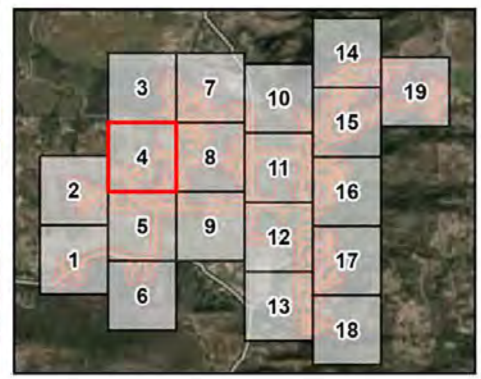
Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 4 of 19

- Survey Area
- Action Area
- Staging Areas
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- D7. Disturbed Laurel Sumac Scrub



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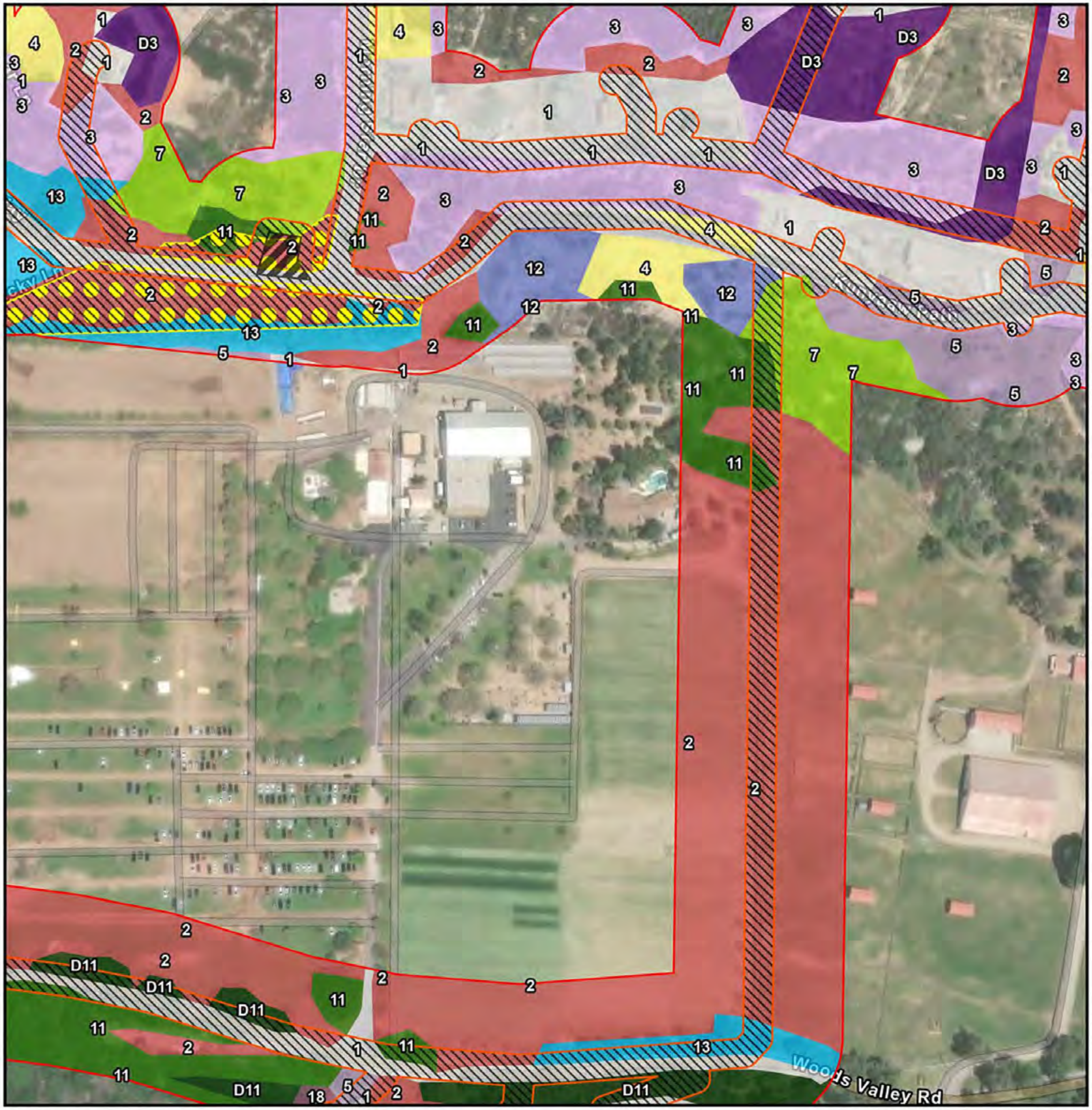
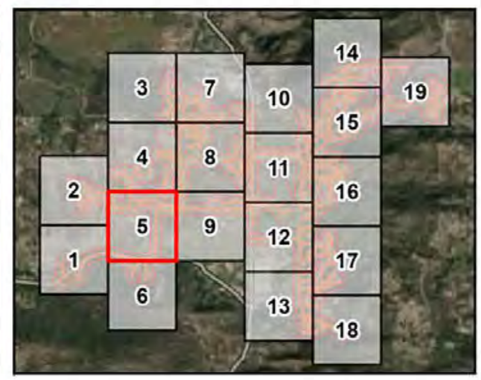


Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities
Page 5 of 19

- Survey Area
- Action Area
- Staging Areas
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 12. Rocky Outcrop
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 18. Scrub Oak Chaparral



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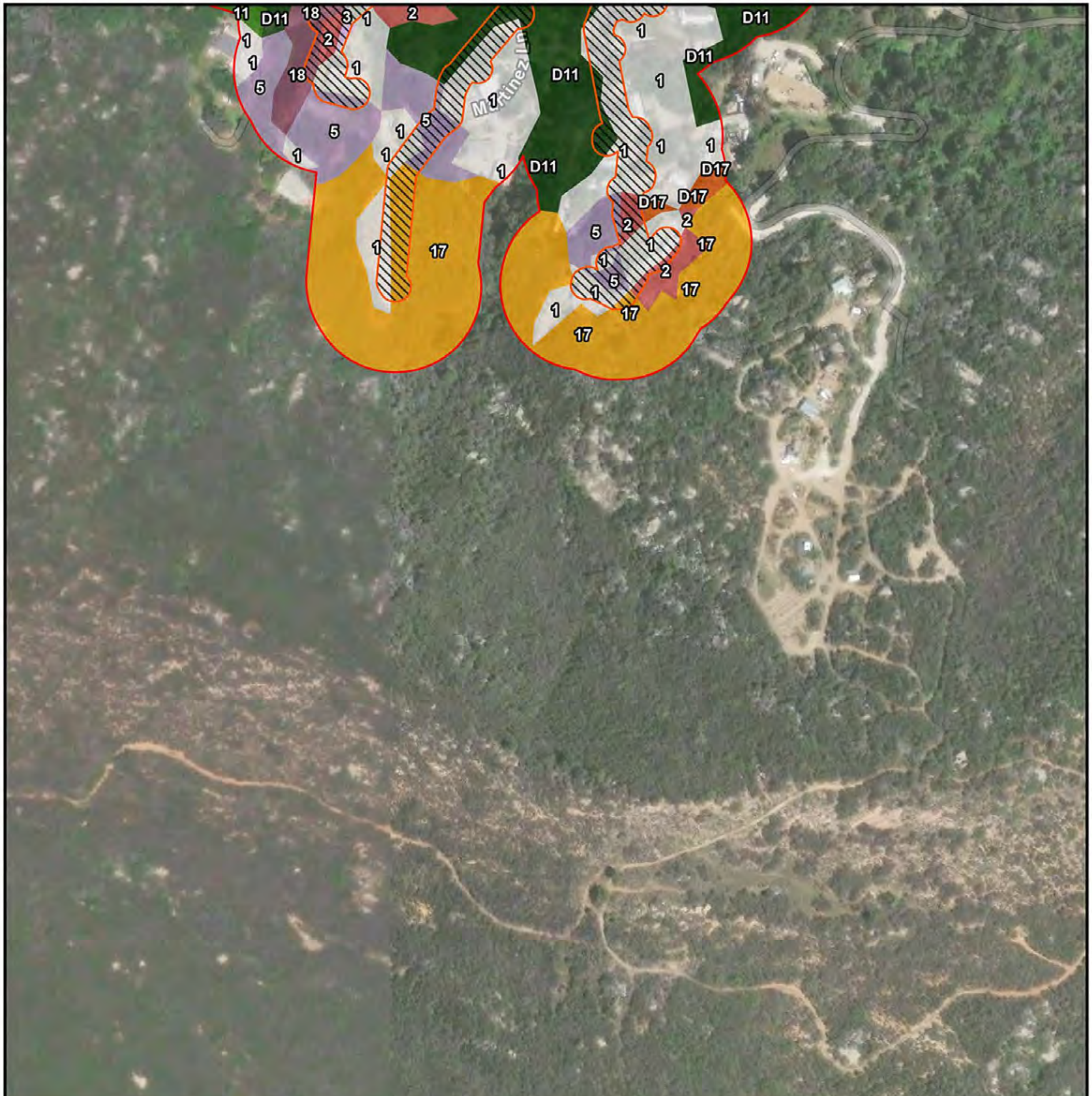


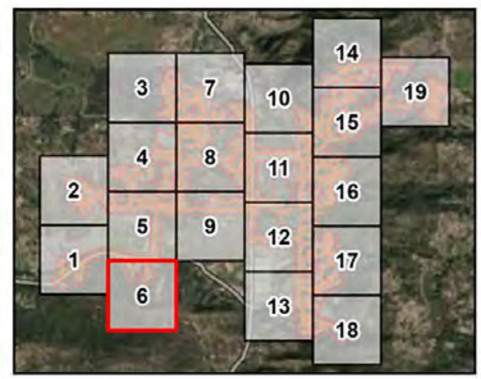
Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 6 of 19

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 17. Hoary Leaf Ceanothus Chaparral
- D17. Disturbed Hoary Leaf Ceanothus Chaparral
- 18. Scrub Oak Chaparral



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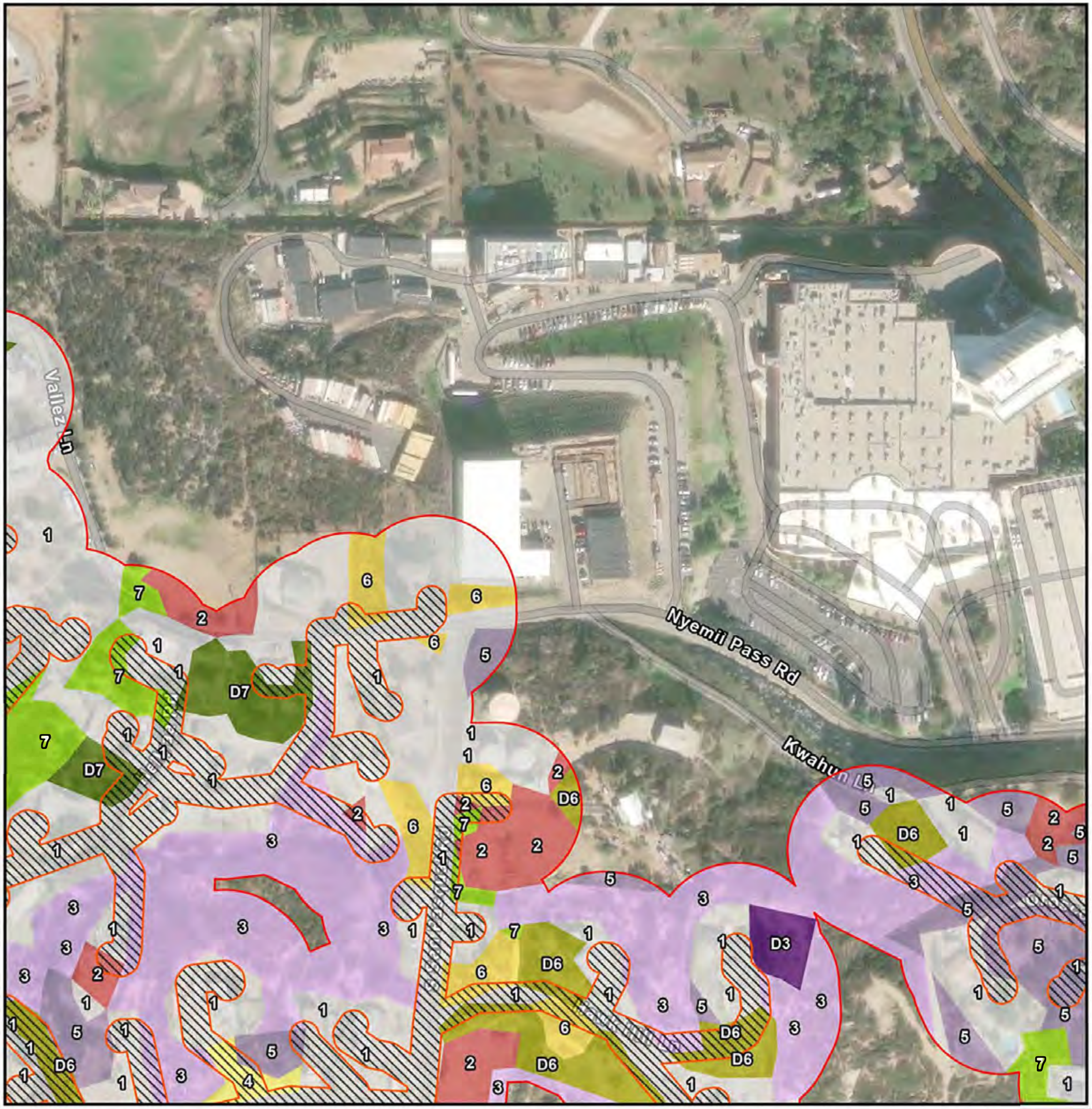

Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 7 of 19

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- D7. Disturbed Laurel Sumac Scrub

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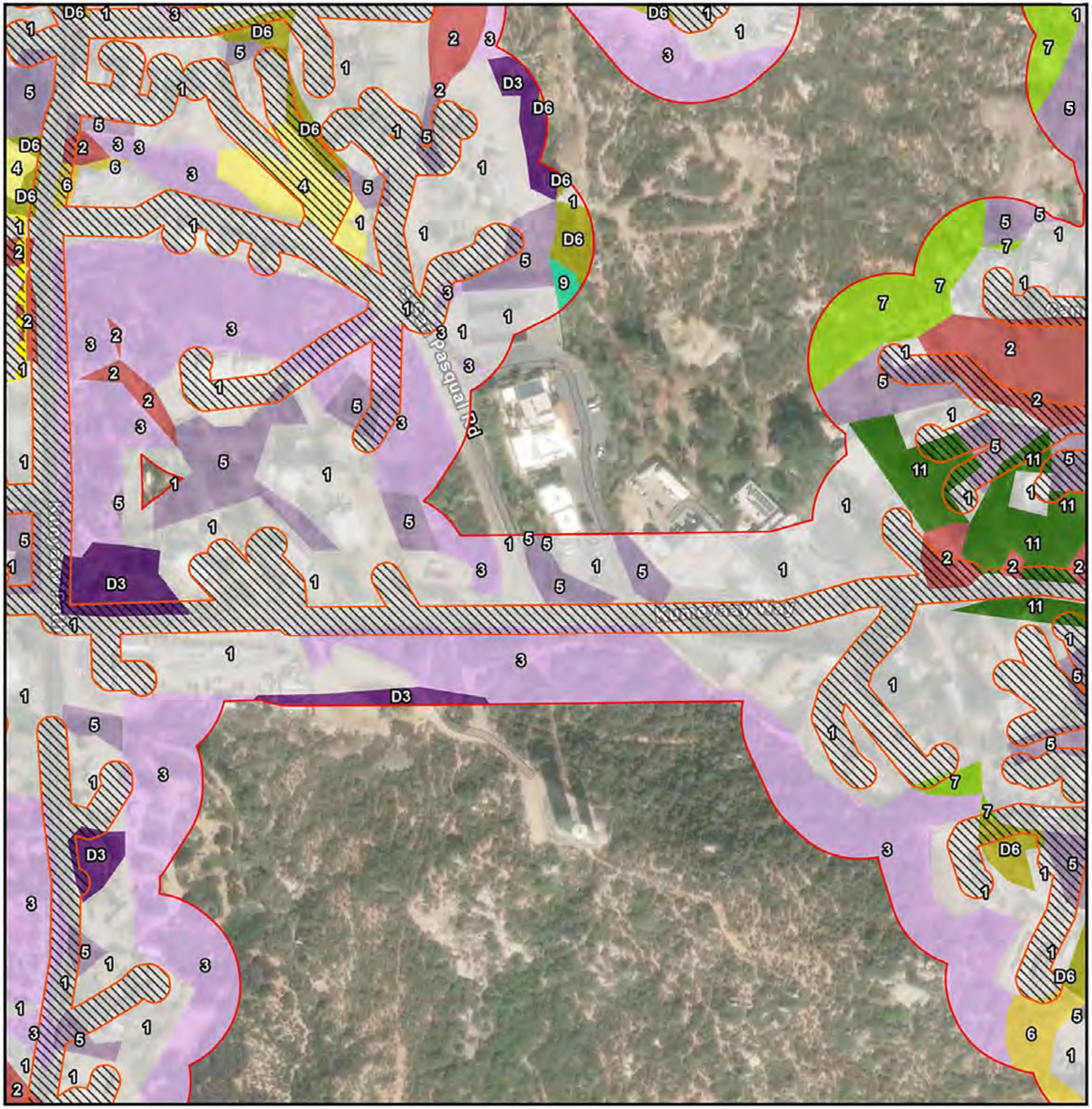
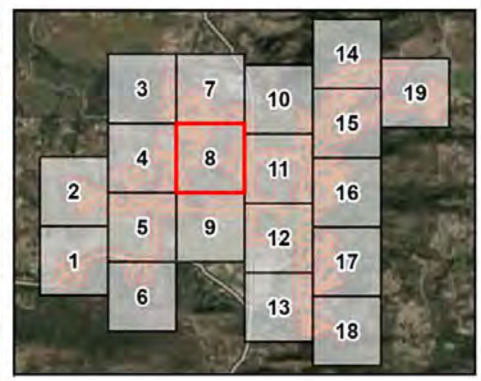


Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities
Page 8 of 19

- Survey Area
- Action Area
- Staging Areas
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 9. Mulefat Thicket
- 11. Coast Live Oak Woodland



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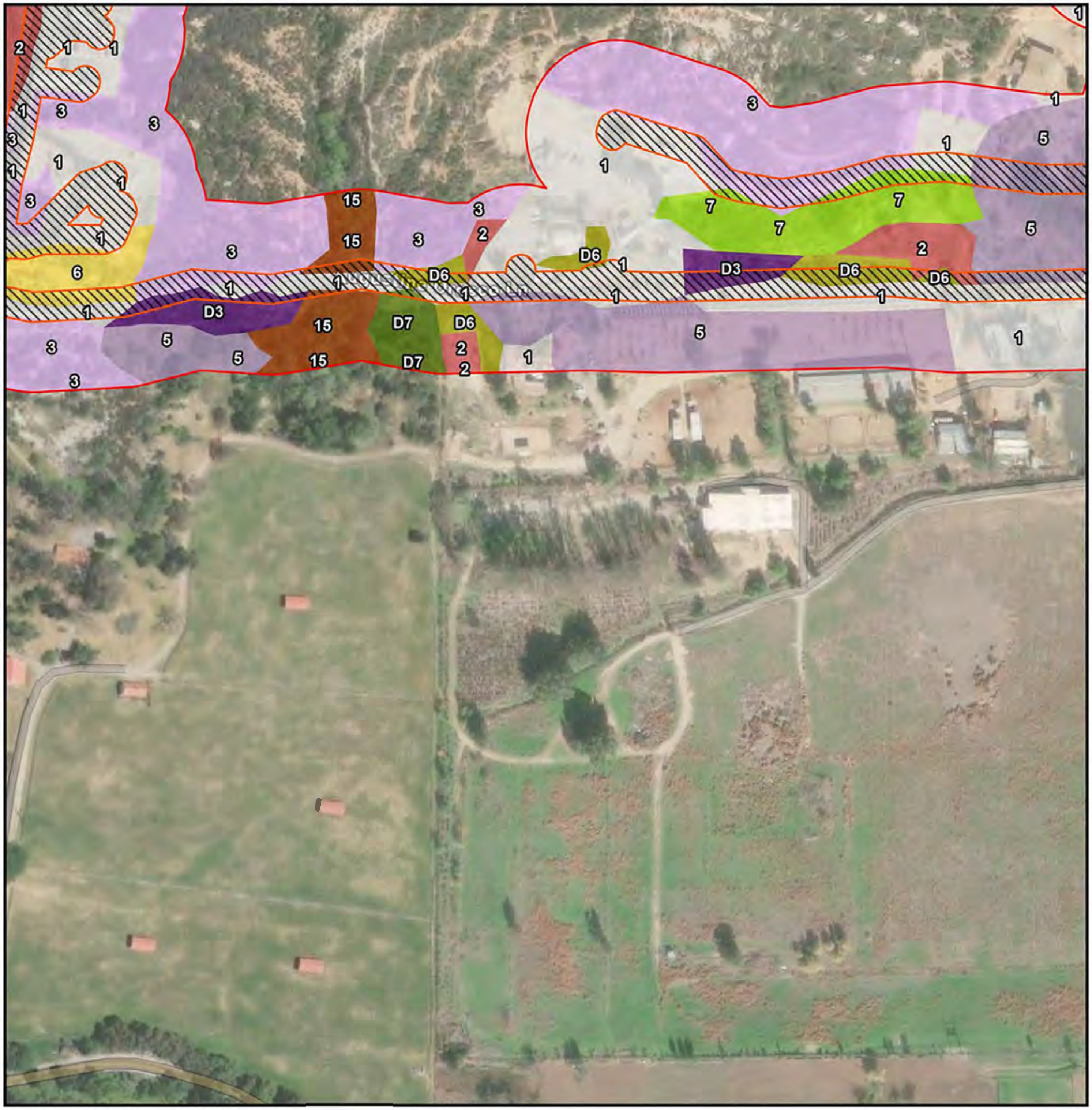

Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 9 of 19

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- D7. Disturbed Laurel Sumac Scrub
- 15. Gooding's Willow - Red Willow Riparian Woodland

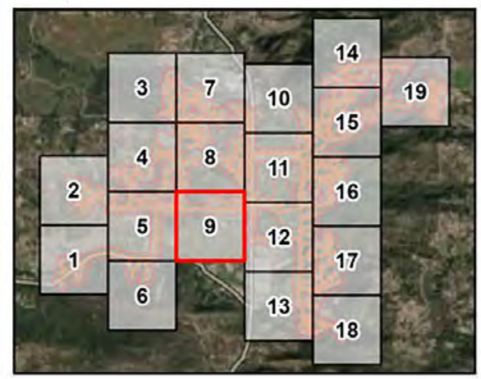

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Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
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Survey Area
Action Area
Temporary Impact

Vegetation Communities

1. Developed
2. Ruderal
5. Landscape/Ornamental

D6. Disturbed California Buckwheat Scrub

D11. Disturbed Coast Live Oak Woodland

13. California Sycamore - Coast Live Oak Riparian Woodland

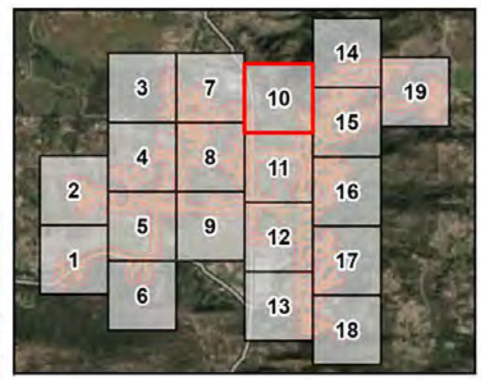

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Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 11 of 19

- Survey Area
- Action Area
- Staging Areas
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 19. Cattail Marshes

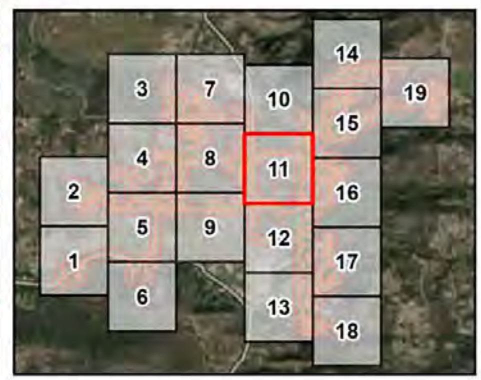

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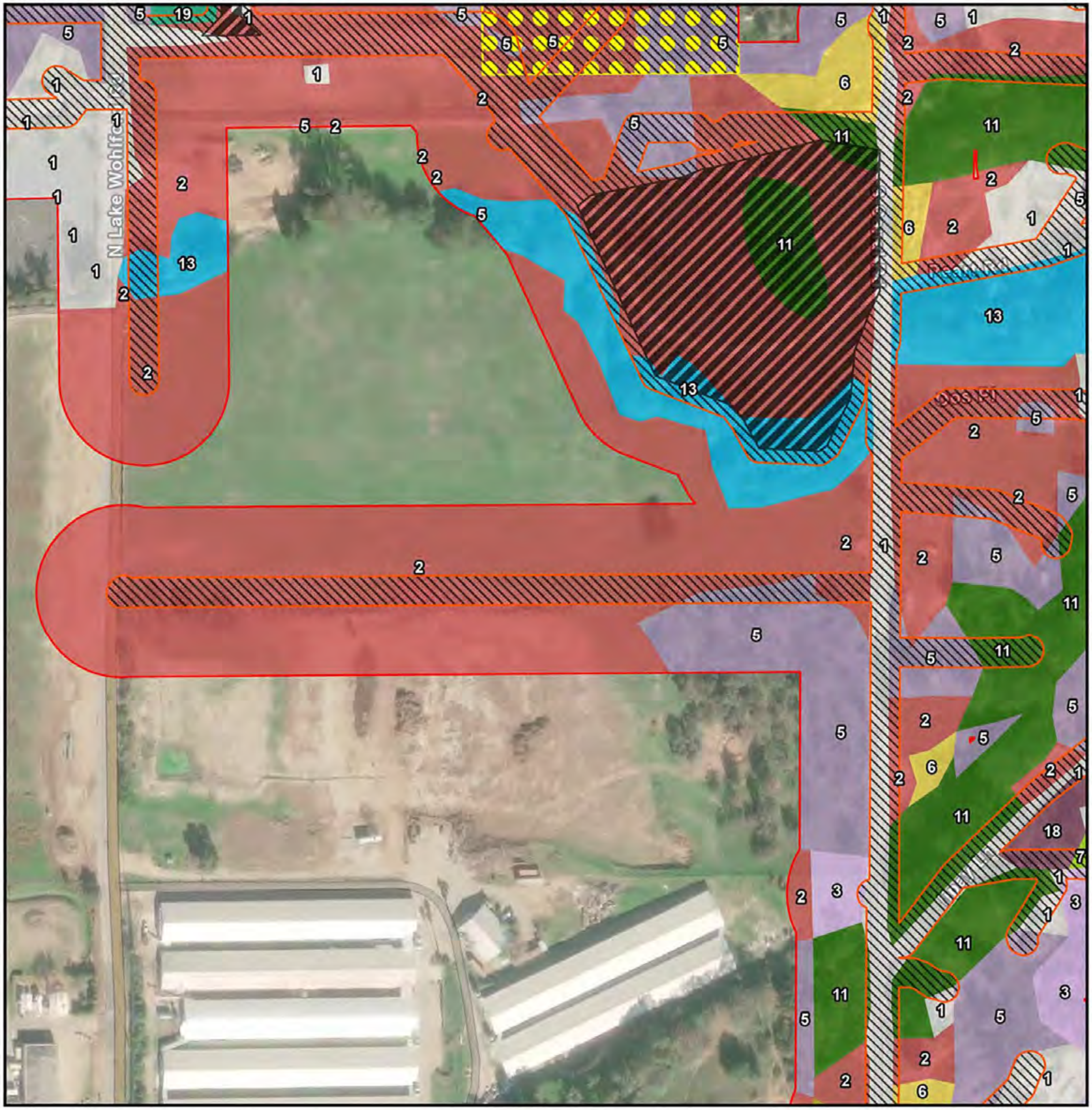
Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 12 of 19



- Survey Area
- Action Area
- Staging Areas
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 11. Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 18. Scrub Oak Chaparral
- 19. Cattail Marshes

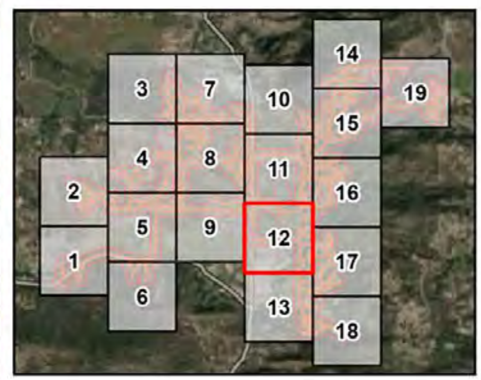


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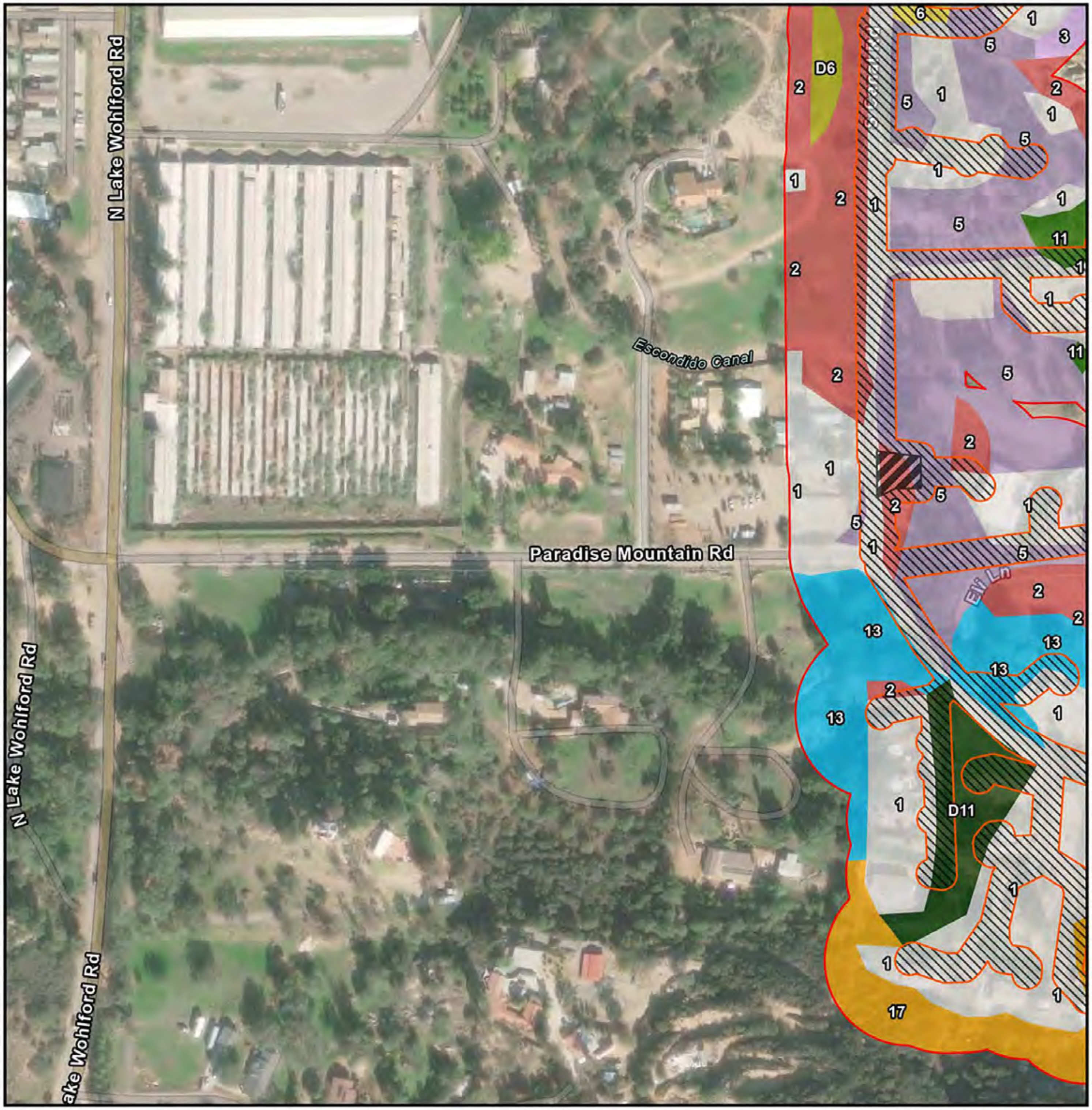
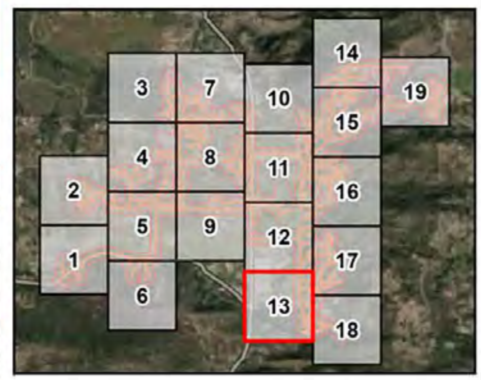
Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities



- Survey Area
- Action Area
- Permanent Impact
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 17. Hoary Leaf Ceanothus Chaparral



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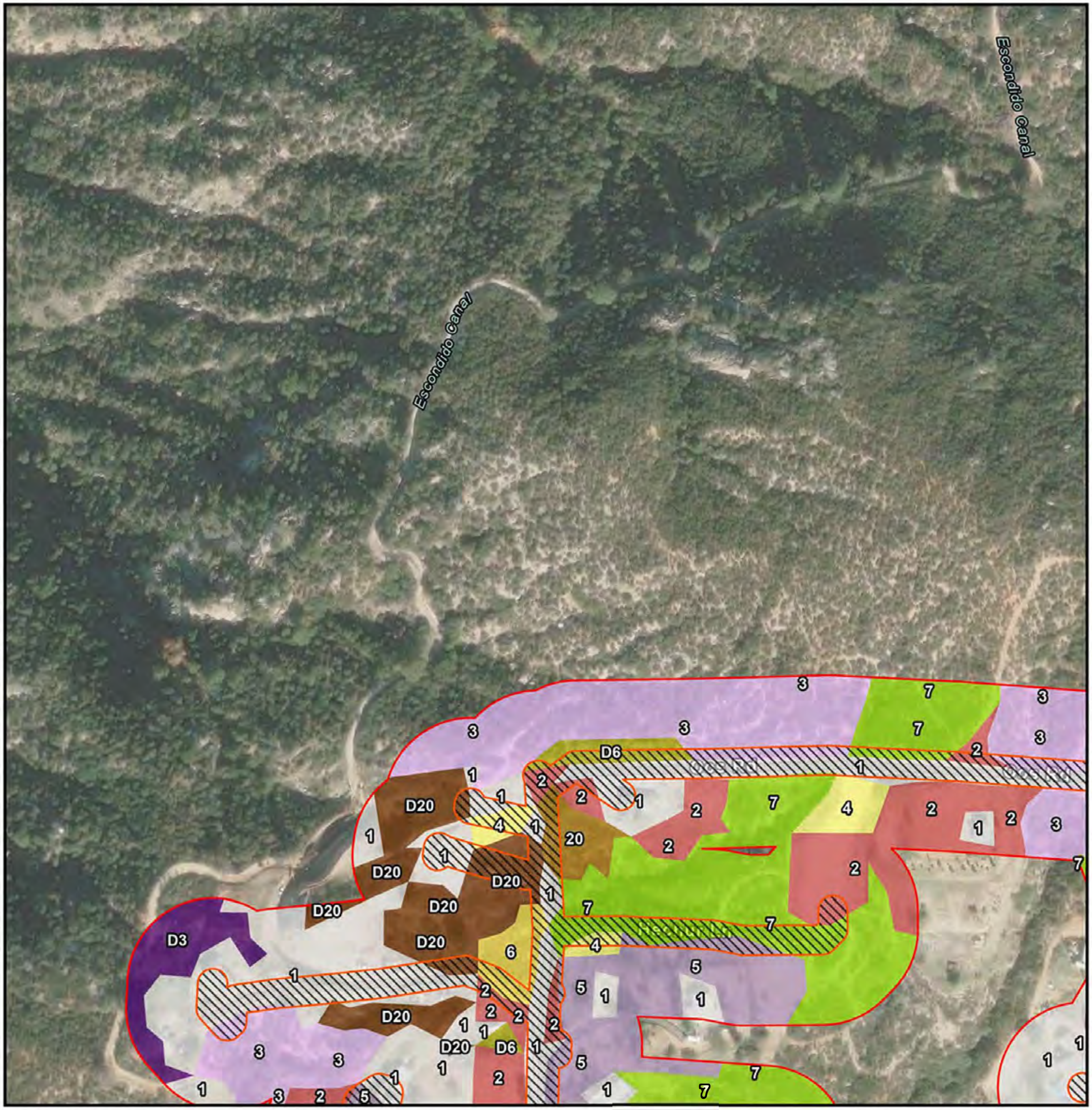

Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities
Page 14 of 19

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 20.California Sagebrush Scrub
- D20. Disturbed California Sagebrush Scrub

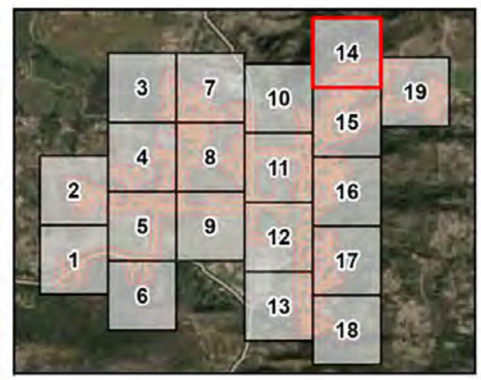

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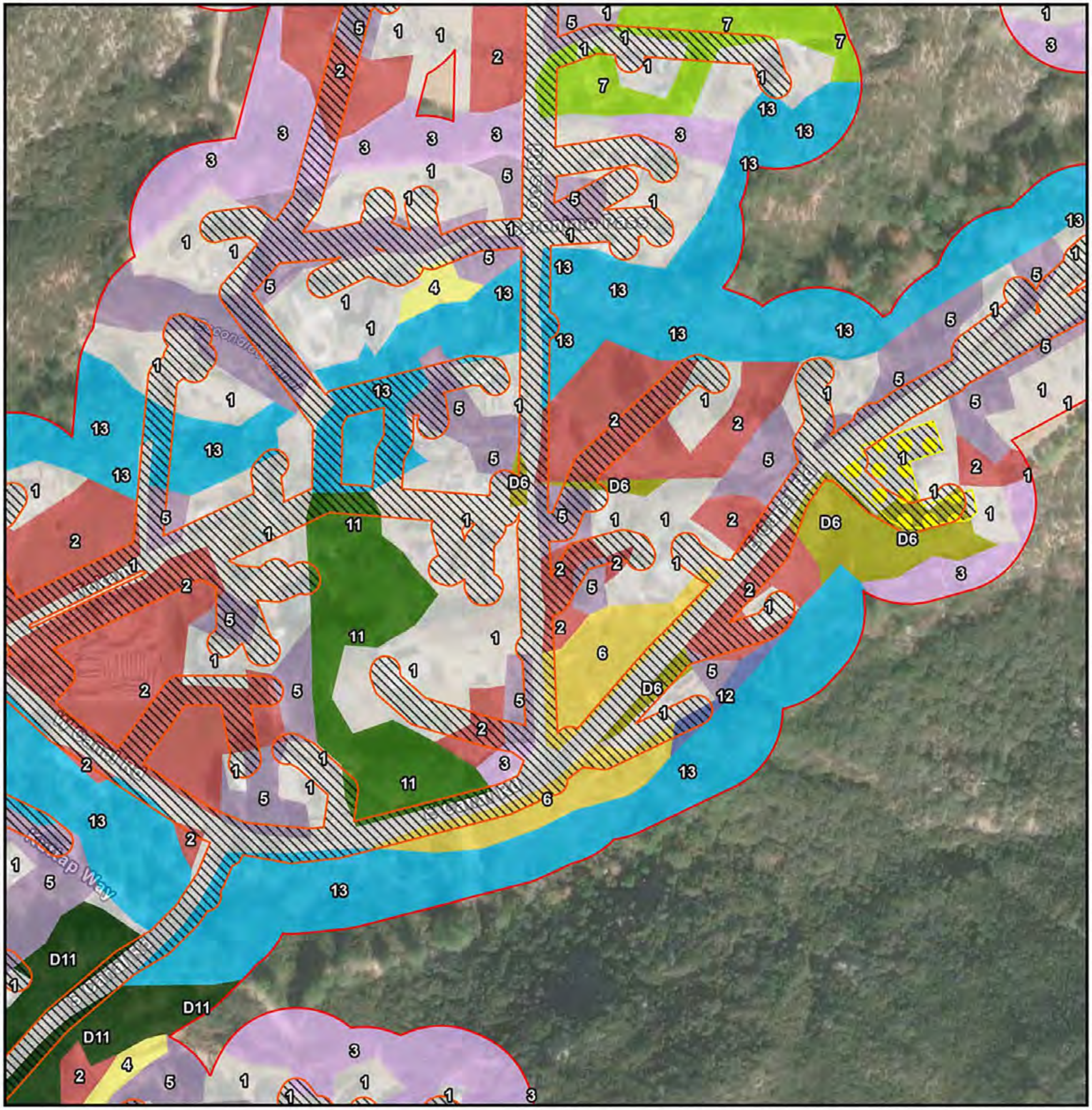
Figure 6a

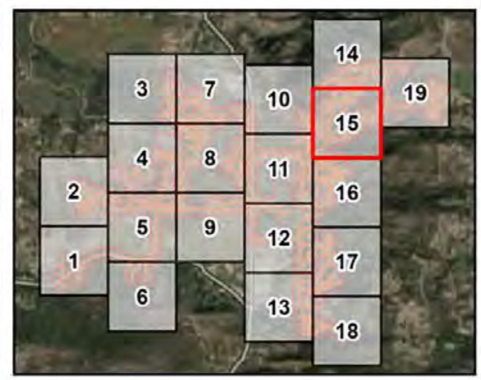
San Pasqual Community Sewer Bio
Vegetation Communities
Page 15 of 19



- Survey Area
- Action Area
- Staging Areas
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 12. Rocky Outcrop
- 13. California Sycamore - Coast Live Oak Riparian Woodland



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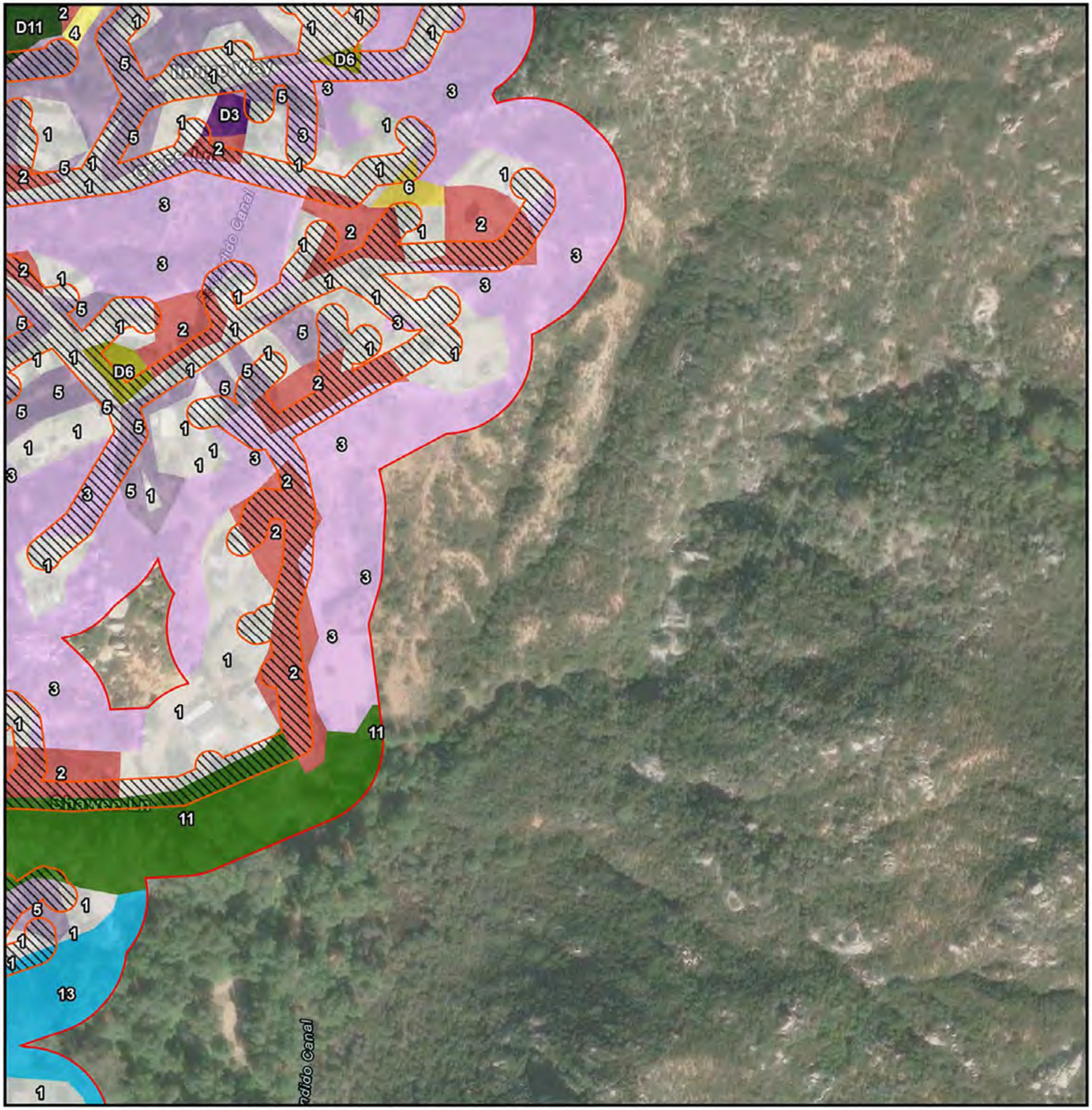

Figure 6a

San Pasqual Community Sewer Bio
Vegetation Communities

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- D3. Disturbed Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland

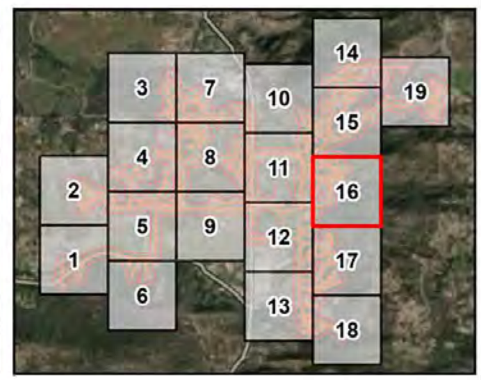

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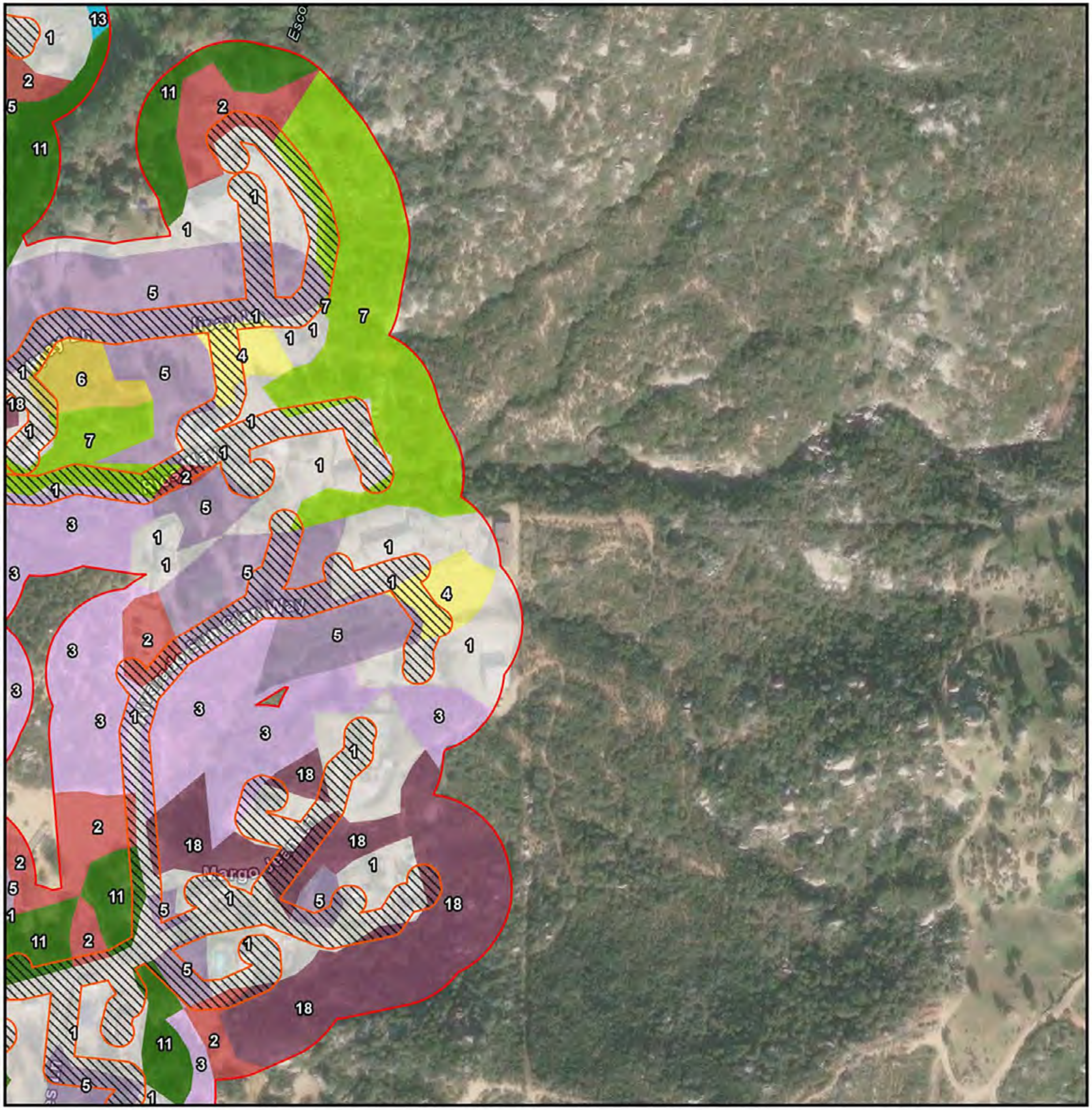
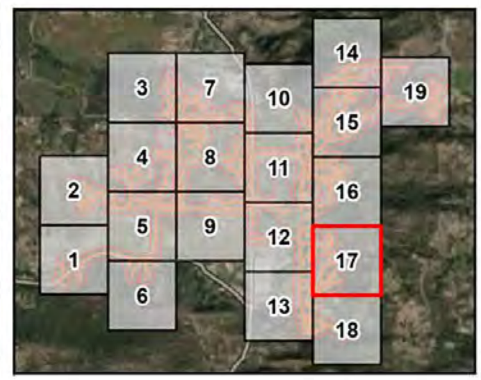
Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities
Page 17 of 19



- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- 11. Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 18. Scrub Oak Chaparral



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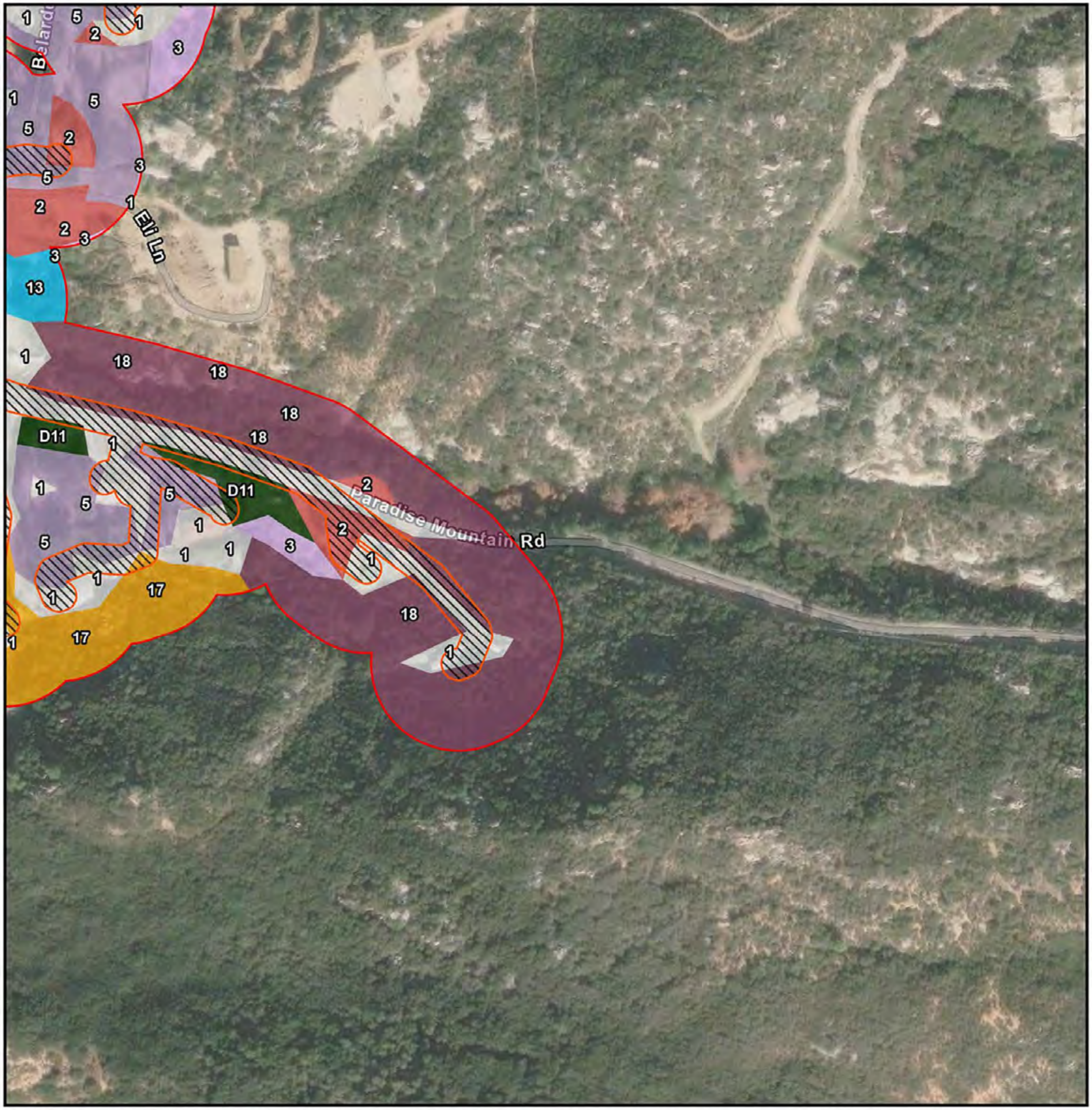

Figure 6a
San Pasqual Community Sewer Bio
Vegetation Communities
Page 18 of 19

- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- 17. Hoary Leaf Ceanothus Chaparral
- 18. Scrub Oak Chaparral

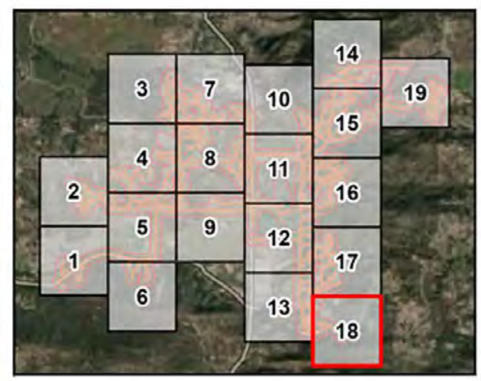

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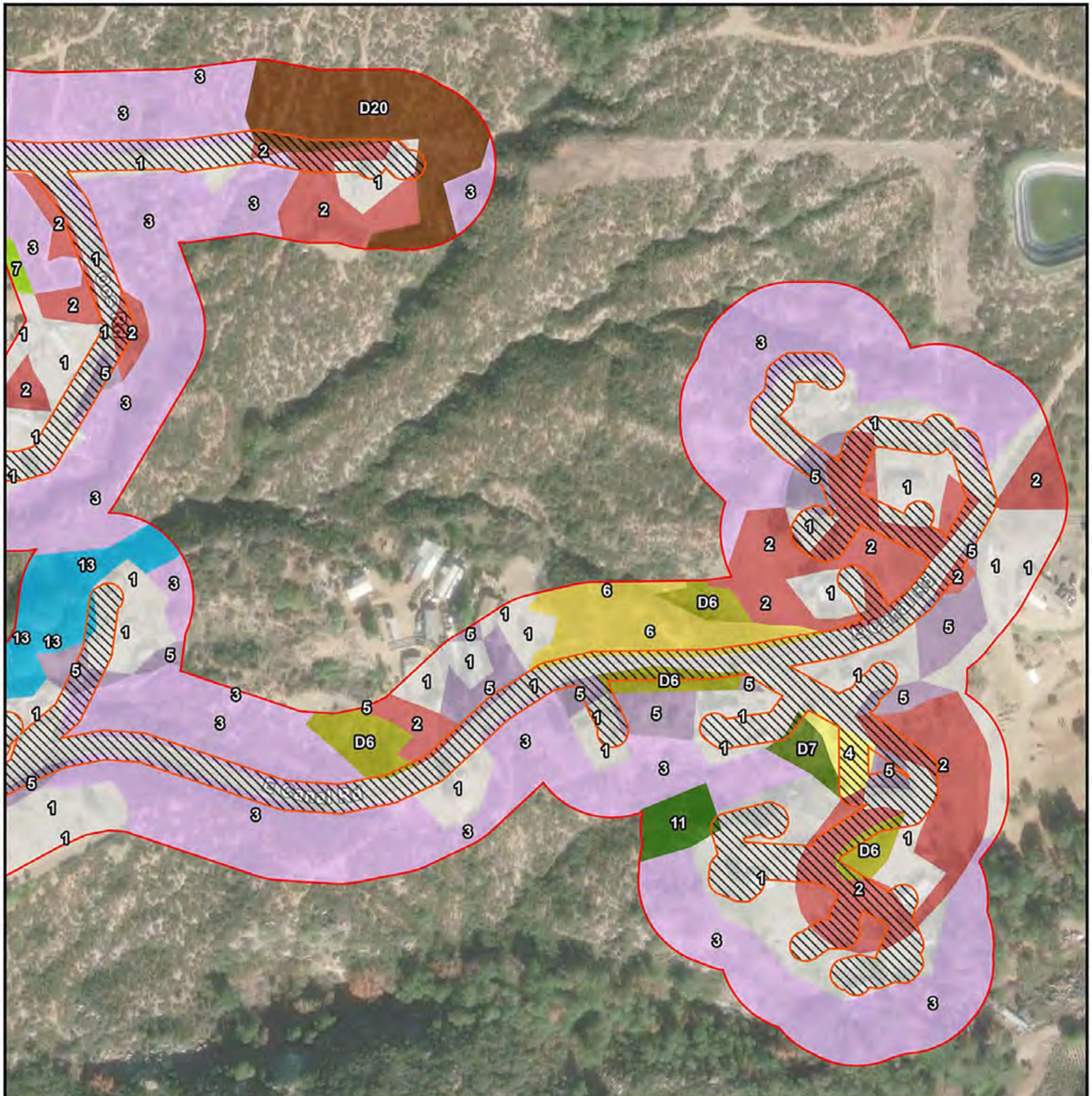
Figure 6a

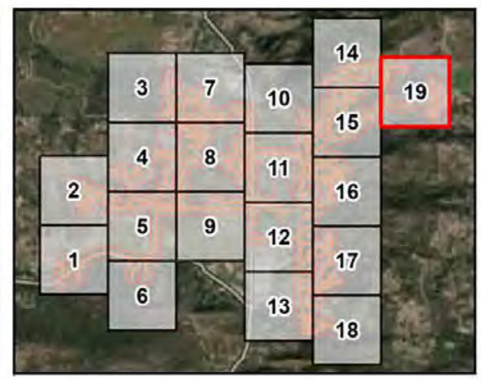
San Pasqual Community Sewer Bio
Vegetation Communities
Page 19 of 19



- Survey Area
- Action Area
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 4. Bare Ground
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- D6. Disturbed California Buckwheat Scrub
- 7. Laurel Sumac Scrub
- D7. Disturbed Laurel Sumac Scrub
- 11. Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland
- D20. Disturbed California Sagebrush Scrub



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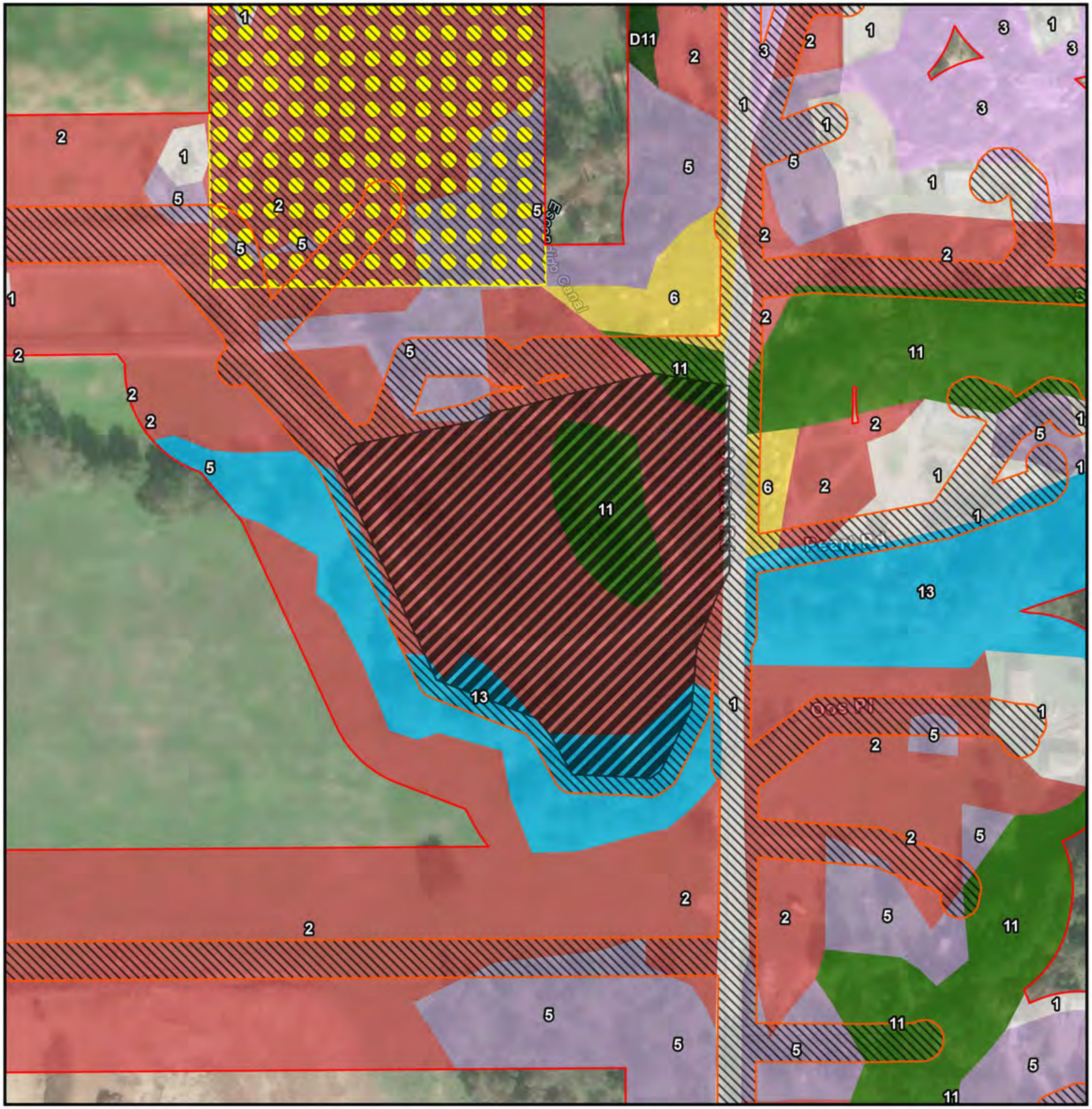

Figure 6b

San Pasqual Community Sewer Bio
Vegetation Communities
WWTP Location

- Survey Area
- Action Area
- Staging Areas
- Permanent Impact (WWTP Location)
- Temporary Impact

Vegetation Communities

- 1. Developed
- 2. Ruderal
- 3. Mission Manzanita Chaparral
- 5. Landscape/Ornamental
- 6. California Buckwheat Scrub
- 11. Coast Live Oak Woodland
- D11. Disturbed Coast Live Oak Woodland
- 13. California Sycamore - Coast Live Oak Riparian Woodland

N

0 100 200 400
Feet

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5.4 GENERAL PLANTS

A total of 98 plant species were observed during the surveys. Plant species observed or detected during the survey were characteristic of the existing Survey Area conditions. No special status species were observed during the survey effort. A complete list of plants observed is provided in Appendix B.

5.5 GENERAL WILDLIFE

A total of 54 wildlife species were detected during the survey. Wildlife species detected during the survey were characteristic of the existing Survey Area conditions. No special status species were observed during the survey effort. Habitat for nesting birds and raptors was present throughout the Survey Area. One active avian nest, Allen's hummingbird (*Selasphorus sasin*) was observed incubating within a coast live oak near the western end of the Survey Area, at GPS location 33.205199N, 116.988296W during the field survey. Several raptors, including red-tailed hawk (*Buteo jamaicensis*) and red-shouldered hawk (*Buteo lineatus*) were observed during the survey. No active raptor nests were observed. A complete list of wildlife detected is provided in Appendix C.

5.6 SPECIAL STATUS SPECIES

The following information is a list of abbreviations used to help determine the significance of biological special status resources potentially occurring on the Survey Area.

FE	=	federally listed as endangered
FT	=	federally listed as threatened
FPT	=	federally proposed for listing as threatened
BCC	=	USFWS Birds of Conservation Concern

Factors used to determine the PFO included the quality of habitat, elevation, soil type, and the results of the field survey. In addition, the locations of prior CNDDB, USFWS, and research-grade iNaturalist historical records of occurrence were used as additional data, but because these are positive-sighting databases, these data were used only in support of the analysis from the previously identified factors. The criteria used to evaluate the potential for special status species to occur on the Survey Area are outlined in Table 10.

Table 10: Criteria for Evaluating Special Status Species Potential for Occurrence (PFO)

PFO*	CRITERIA
Absent:	Species is restricted to habitats or environmental conditions that do not occur within the Survey Area.
Low:	Historical records for this species do not exist within the immediate vicinity (approximately 5 miles) of the Survey Area, and/or habitats or environmental conditions needed to support the species are of poor quality.
Moderate:	Either a historical record exists of the species within the immediate vicinity of the Survey Area (approximately 3 miles) and marginal habitat exists on the Survey Area, or the habitat requirements or environmental conditions associated with the species occur within the Survey Area, but no historical records exist within 5 miles of the Survey Area.
High:	Both a historical record exists of the species within the Survey Area or its immediate vicinity (approximately 1 mile), and the habitat requirements and environmental conditions associated with the species occur within the Survey Area.
Present:	Species was detected within the Survey Area at the time of the survey.

* PFO: Potential for Occurrence

5.6.1 Special Status Plant Species

A current database search (CDFW 2024; CNPS 2024) resulted in a list of nine special status plant species known to occur within the Project vicinity (Figure 7: Special Status Species Historical Occurrences Map). Of these nine plant species, four are considered **Absent**, one has a **Low** potential, and four have a **Moderate** PFO within the Survey Area. Appendix D provides a table with the federal listing status, flowering season, habitat and distribution, and PFO discussion for these nine species. Figure 8: Suitable Habitat for Special Status Plant Species Map displays approximate suitable habitat for special status plants within the Survey Area and Action Area, based on the vegetation mapping effort.

The following four plant species are considered **Absent** from the Survey Area due to it being restricted to habitats or environmental conditions that do not occur within the Survey Area:

- Encinitas Baccharis (*Baccharis vanessae*) – **FT**
- salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*) – **FE**
- San Bernardino blue grass (*Poa atropurpurea*) – **FE**
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*) – **FE**

The following one plant species have a **Low** PFO within the Survey Area because habitat needed to support the species is limited and of poor quality within the Survey Area:

- spreading navarretia (*Navarretia fossalis*) – **FT**

The following four plant species have a **Moderate** PFO within the Survey Area because a historical record exists of the species within the immediate vicinity of the Survey Area (approximately 3 miles) and marginal habitat exists on the Survey Area, or the habitat requirements or environmental conditions associated with the species occur within the Survey Area, but no historical records exist within 5 miles of the Survey Area. These species are further discussed in the paragraphs below:

- San Diego thorn-mint (*Acanthomintha ilicifolia*) – **FT**
- San Diego ambrosia (*Ambrosia pumila*) – **FE**
- Nevin's barberry (*Berberis nevinii*) – **FE**
- thread-leaved brodiaea (*Brodiaea filifolia*) – **FT**

<u>San Diego thorn-mint – FT</u>

San Diego thorn-mint is a federally listed endangered species. This annual herb flowers between April and June in chaparral, coastal sage scrub, and valley and foothill grasslands. This species is endemic to active vertisol clay soils and clay depressions on mesas and valleys and can sometimes be found in vernal pools at elevations from 30 to over 3,000 feet amsl. San Diego thorn-mint ranges from southwest San Diego County to Baja. Threats to this species include urbanization, road construction, vehicles, grazing, trampling, erosion, and competition from non-native plants.

A limited amount of chaparral and coastal scrub habitat with clay soils suitable to support San Diego thorn-mint is scattered throughout the Survey Area and five research-grade iNaturalist historical records of occurrence are documented within four miles south and southeast of the Survey Area from 2023, the closest being approximately 0.7 mile southeast. Therefore, this species has a **Moderate** PFO within the Survey Area.

<u>San Diego ambrosia – FE</u>

San Diego ambrosia is a federally listed endangered species. This perennial herb flowers between June and September in dry, sunny areas along roadsides and disturbed sites of chaparral, coastal sage scrub, foothill, and valley grasslands at elevations between 60 and 1400 feet amsl. San Diego ambrosia ranges from San Diego County Lake Hodges to National City. This species is threatened by development, road maintenance, trampling, and competition from non-native plants. Often times this species is confused with Mexican ragweed (*Ambrosia confertiflora*).

Sandy clay loam soils within chaparral and coastal scrub habitat suitable to support San Diego ambrosia are present within the Survey Area, and one research-grade iNaturalist historical record of occurrence is documented approximately 3.9 miles southwest of Survey Area from 2017. Therefore, this species has a **Moderate** PFO within the Survey Area.

<u>Nevin's barberry – FE</u>

Nevin's barberry is a federally listed endangered species. This evergreen shrub flowers between March and June in sandy or gravelly soils on steep north-facing slopes or in low grade, sandy washes often on banks of ephemeral streams in foothills of transverse and peninsular ranges at elevations between 1,000 to 2,700 feet amsl. Habitats include chaparral, cismontane woodland, coastal scrub, and riparian scrub. Known ranges include: Los Angeles, Riverside, San Bernardino, and San Diego counties. Many historical occurrences have been extirpated. Threats to Nevin's barberry include development and road maintenance.

Although no historical records of Nevin's barberry are documented within 5 miles of the Survey Area, chaparral, cismontane woodland, and coastal scrub habitats with sandy soils suitable to support this species occur throughout the Survey Area. Therefore, this species has a **Moderate** PFO within the Survey Area.

thread-leaved brodiaea – FT

Thread-leaved brodiaea is a federally listed threatened species. This perennial herb flowers between March and June in heavy clay soils of chaparral, cismontane woodland, coastal scrub, playas, vernal pools, and valley and foothill grassland at elevations 80 to 2,800 feet amsl. Known ranges include Los Angeles, Orange, Riverside, San Diego, and San Luis Obispo counties. Threats to thread-leaved brodiaea include residential development, agriculture, grazing, and vehicles. This species has also been known to hybridize with Orcutt's brodiaea (*Brodiaea orcuttii*) and dwarf brodiaea (*Brodiaea terrestris* ssp. *kernensis*) facilitated by European honeybees.

Clay soils within chaparral, cismontane woodland, and coastal scrub habitat suitable to support thread-leaved brodiaea are present within the Survey Area, and six research-grade iNaturalist historical records of occurrence are documented within five miles of the Survey Area from 2019 to 2022, with the closest being approximately 1.1 miles southwest of the Survey Area in 2022. Therefore, this species has a **Moderate** PFO within the Survey Area.

5.6.2 Special Status Wildlife

A current database search (CDFW 2024; USFWS 2024b and 2024d) resulted in a list of 10 federally listed or proposed listed as endangered or threatened species, or Birds of Conservation Concern (BCC), known to occur within the Project vicinity (Figure 7: Special Status Species Historical Occurrences Map). After the literature review, biological reconnaissance survey, assessment of the various habitat types within the Survey Area, and focused surveys for coastal California gnatcatcher and least Bell's vireo, it was determined that six special status wildlife species are considered **Absent** from the Survey Area, three species have a **Low** PFO, and one species has a **Moderate** potential of occurrence. No special status species were observed during the surveys. Factors used to determine PFO included the quality of habitat, date and location of prior CNDDB and USFWS records of occurrence, and results of focused surveys. Appendix E provides a table with the federal listing status, habitat and distribution, and PFO discussion for these 10 species. Figure 9: Suitable Habitat for Special Status Wildlife Species Map displays approximate suitable habitat for special status plants within the Survey Area and Action Area, based on the vegetation mapping effort.

The analysis of the CNDDB, USFWS occurrences database, and USFWS IPaC search and field survey resulted in three species considered **Absent** since habitat and environmental conditions do not exist within the Survey Area:

- western pond turtle (*Emys marmorata*) – **FPT**
- Swainson's hawk (*Buteo swainsoni*) – **BCC**
- bald eagle (*Haliaeetus leucocephalus*) – **BCC** (nesting and wintering)
- tricolored blackbird (*Agelaius tricolor*) – **BCC** (nesting colony)

Based on the database search and biological reconnaissance survey and prior to conducted focused surveys, the following two species were considered to have a moderate PFO within the Survey Area.

Focused surveys were subsequently conducted in 2025 and the findings were negative. Therefore, these two species can be considered **Absent** from the Survey Area. These species are further discussed in the paragraphs below:

- coastal California gnatcatcher (*Polioptila californica californica*) – **FT** (foraging and nesting)
- least Bell's vireo (*Vireo bellii pusillus*) – **FE** (nesting)

coastal California gnatcatcher – FT (foraging and nesting)

The coastal California gnatcatcher is a federally threatened species. The range of this subspecies extends from southern California west of the Peninsular and Transverse ranges south into northwestern Baja California, Mexico. The gnatcatcher has a short and slender bill; tail is mostly black with white edges, grayish overall, back and wings grey with brown tinge and a white eye ring. Breeding males have a black cap. It is a permanent resident of Diegan, Riversidian, and Venturan sage scrub sub-associations found from sea level to 2,500 feet in elevation. The species lives and breeds within California sagebrush dominant habitats and mixed scrub habitats with lesser percentages of this favored shrub (Atwood and Bontrager 2001). The subspecies generally begins nest building in mid-March, dependent on winter precipitation, with most nesting attempts completed by mid-July (Grishaver et al. 1998). Coastal California gnatcatchers primarily feed upon beetles, bugs, caterpillars, spiders, and grasshoppers. The largest threat to the species is a loss of coastal sage scrub habitat and habitat fragmentation; other threats include wildfires and nest parasitism (Atwood and Bontrager 2020).

Patches of moderately suitable coastal sage scrub habitat to support foraging and nesting of the coastal California gnatcatcher are present within the northern half of the Survey Area. While the Survey Area does not occur within critical habitat for the coastal California gnatcatcher, there is critical habitat mapped for this species approximately 2.2 miles southwest of the Survey Area (Figure 10: USFWS Critical Habitat Map). There are 2 CNDDB and 3 USFWS historical occurrences within 5 miles of the Survey Area, approximately 1.2 miles northeast and 3.9 miles southwest. Based on these findings from the database search and biological reconnaissance survey alone, this species was considered to have a moderate PFO within the Survey Area. Informal consultant with the USFWS was completed, and the USFWS requested that focused surveys be conducted. Chambers Group subsequently completed focused surveys in the breeding season of 2025 which were negative. Therefore, coastal California gnatcatcher can be considered **Absent** from the Survey Area.

least Bell's vireo – FE (nesting)

The least Bell's vireo (nesting) is a federally listed endangered subspecies of the Bell's vireo. This small passerine subspecies has a breeding range that is restricted to lower elevations of coastal California and northwestern Baja California, Mexico with a few inland populations (Franzreb 1989). Its winter range extends into southern Baja California, Mexico (R. Hutto, pers. comm., cited in Franzreb 1989). This bird is approximately 4.3 to 4.7 inches in length with an overall drab appearance consisting of brownish grey upperparts and a whitish underside, and a faint white eye-ring. Its unique song most easily identifies it. The least Bell's vireo typically nests in willows (*Salix* spp.) and other riparian trees or shrubs, and typically nests three to six feet above the ground. This species requires densely vegetated riparian habitat along streams and rivers during the breeding season, which occurs from April to July, and foraging in habitat adjacent to its nesting territory, which is typically riparian or chaparral (Gray and Greaves 1984; Franzreb 1989; USFWS 1994). Least Bell's vireos forage by gleaning insects from the leaves of trees and shrubs. The major threats and subsequent factors in the decline of least Bell's vireo populations are the loss of riparian habitat from urban and agricultural development, overgrazing, flood control projects and logging operations, exotic plant invasion, and nest parasitism by the brown-headed cowbird (Brown 1993, Franzreb 1989, Kus 2022). The introduction of the invasive shot hole borer (*Euwallacea spp.*), which has infested and killed large numbers of willow trees in native riparian habitat, poses an emerging threat to the Arizona Bell's vireo (Kus et al. 2022). Despite historic least Bell's vireo population losses followed by federal protection in 1986, recent trends indicate that populations are increasing with populations returning to parts of their former range and colonizing some new areas (USFWS 1998). With numbers having declined to approximately 300 territorial males in 1986 (USFWS 1998), the population had rebounded to 3,000 territorial males in 2006 (USFWS 2006).

Patches of moderately suitable riparian habitat for foraging and nesting of the least Bell's vireo are present, particularly in the northeastern and southwestern portions of the Survey Area. Critical habitat for this species is not mapped within 5 miles of the Survey Area. There are 16 CNDDB/USFWS historical occurrences documented within 5 miles of the Survey Area, primarily at Lake Wohlford Park to the south and along the Moosa Canyon Stream system to the west. The closest historical occurrence was 1.7 miles southwest of the Survey Area in 2009. Based on these findings from the database search and biological reconnaissance survey, this species was considered to have a moderate PFO within the Survey Area. Informal consultant with the USFWS was completed, and the USFWS requested that focused surveys be conducted. Chambers Group subsequently completed focused surveys in the breeding season of 2025 which were negative. Therefore, coastal California gnatcatcher can be considered **Absent** from the Survey Area.

The analysis of the CNDDB, USFWS occurrences database, and USFWS IPaC search and field survey resulted in three species with a **Low** PFO within the Survey Area since habitat is of poor quality and/or historical records of these species do not exist within 5 miles of the Survey Area:

- southwestern willow flycatcher (*Empidonax traillii extimus*) - **FE** (nesting)
- Stephens' kangaroo rat (*Dipodomys stephensi*) – **FT**
- western spadefoot (*Spea hammondii*) – **FPT**

The analysis of the CNDDB, USFWS occurrences database, and USFWS IPaC search and field survey resulted in one species with a **Moderate** PFO within the Survey Area since either a historical record exists of the species within the immediate vicinity of the Survey Area (approximately 3 miles) and marginal habitat exists on the Survey Area, or the habitat requirements or environmental conditions associated with the species occur within the Survey Area, but no historical records exist within 5 miles of the Survey Area. This species is further discussed in the paragraph below:

- arroyo toad (*Anaxyrus californicus*) – **FE**

arroyo toad – FE

The arroyo toad is a federally listed endangered species. The range of this species is within coastal California from Monterey County into northwestern Baja California, Mexico. This small to moderately sized species is distinguished from other toads by its chevron-shaped marking between the eyes and by the lack of a mid-dorsal stripe. Coloration may vary from light olive-gray to tannish brown above, and the unmarked undersurfaces are creamy to dirty white. The iris is dark brown with scattered gold iridophores on the upper and lower portions of the iris. It is found in washes, streams, and arroyos; and preferred habitats include sandy banks within riparian woodlands such as willow, cottonwood, sycamore, mule fat, and/or coast live oak. It breeds in shallow, sandy or gravelly riverine pools with low silt content, and normally disperses onto adjacent uplands after breeding. Individuals have been observed up to two kilometers (km) from the streams in which they breed, but most often they are within 0.5 km of those streams (USFWS 1992). During the breeding season, males call nocturnally from open areas on banks at the edges of streams. Males typically precede females at breeding sites. Females lay their eggs among gravel, leaves, or sticks on mud or clean sand within low to moderately flowing sections of streams in areas with little or no emergent vegetation and little woody marginal growth. Newly metamorphosed individuals remain near pools for up to several weeks until the areas are dry. Juveniles begin feeding primarily on ants and shift to small beetles as they grow (Sweet 1991) before moving into adjacent wintering grounds. Arroyo toads are known to migrate thousands of feet into wintering grounds. Many spend the next six to eight months overwintering in burrows up to 20 centimeters deep in sandy substrates of these habitats. Adults obtain shelter primarily by burrowing into fine, sandy soils in both adjacent and upland habitats (Sweet 1991). The primary threat to this species is habitat loss.

There is moderately suitable habitat present along several drainages within the Survey Area that may support this species. While the Survey Area does not occur within critical habitat for the arroyo toad, USFWS critical habitat is mapped approximately 2.2 miles southeast and 3.0 miles north of the Survey Area (Figure 10: USFWS Critical Habitat Map). There are USFWS and CNDDB occurrences documented during surveys in 2008 as close as 2.16 miles from the Survey Area. In addition, there are research-grade iNaturalist historical occurrences documented approximately 1,000 feet and 0.4 mile southwest of the Survey Area, east of Lake Wohlford Road and south of Paradise Mountain Road. Therefore, this species has a **Moderate** PFO within the Survey Area.

5.7 UNITED STATES FISH AND WILDLIFE SERVICE CRITICAL HABITAT

USFWS Critical Habitat is defined as areas of land, water, and air space containing the physical and biological features essential for the survival and recovery of endangered and threatened species. Designated Critical Habitat includes sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter. Designated Critical Habitats require special management and protection of existing resources, including water quality and quantity, host animals and plants, food availability, pollinators, sunlight, and specific soil types. Designated Critical Habitat delineates all suitable habitat, occupied or not, that is essential to the survival and recovery of the species. According to the USFWS Critical Habitat WebGIS map, the Survey Area does not occur within designated Critical Habitat (USFWS 2024b). The closest Critical Habitat is located approximately 2.2 miles southwest of the Survey Area (for coastal California gnatcatcher), 2.2 miles southeast of the Survey Area (arroyo toad), and 3.6 miles northeast of the Survey Area (southwestern willow flycatcher). No effects to USFWS designated Critical Habitat is anticipated. Figure 10: USFWS Critical Habitat Map shows the location of Critical Habitat within 5 miles of the Survey Area.

5.8 WILDLIFE CORRIDORS

Wildlife corridors are areas that connect fragmented habitats. They serve as wildlife linkages (wildlife travel corridors) between otherwise fragmented patches of habitat caused by changes in vegetation communities, rugged terrain, and human disturbances. These linkages may be drainages, canyons, or ridgelines that provide access to foraging areas, water, breeding sites, and dispersal areas. These corridors provide cover and shelter during travel. Disturbance to wildlife corridors such as anthropogenic activity and development can cause harm to migrating species, cause species to exceed their population thresholds, and/or prevent healthy gene flow between populations.

The Project is in a marginal wildlife corridor for mammals and local birds that travel through the mountain range and use the many waterways within the Survey Area. However, much of the surrounding area, contains agricultural and low-density residential development, making much of the Project suboptimal for wildlife movement. Furthermore, there is ample open space to the south and west of the Survey Area to allow for species movement. There are ephemeral and intermittent drainages that cross through the Survey Area which offer movement corridors for wildlife including migratory and riparian birds. The Escondido Canal previously meandered through the Survey Area and acted as a corridor for fish, toad, and riparian bird species with connectivity to Lake Wohlford. As part of the San Pasqual Undergrounding Project to remove, relocate, and replace approximately 2.5 miles of the Escondido Canal that crosses through the San Pasqual Indian Reservation, the Escondido Canal was largely re-routed outside of the Survey Area and undergrounded along North Wohlford Road in 2022. The original canal right-of-way (ROW) remains undeveloped and still acts as a corridor for wildlife but lacks an open water source for wildlife to drink from or aquatic movement.

Construction activities near drainages and the former Escondido Canal ROW within the Survey Area are not expected to have an effect on wildlife movement, as these features only briefly cross the Survey Area along their path between areas of open space. Construction activities will be intermittent in nature and allow for sufficient wildlife movement between natural habitat areas. Also, Project facilities will mainly be installed underground; therefore, new Project facilities are not expected to permanently change existing wildlife corridors. Therefore, the Project is not anticipated to have an effect on wildlife corridors.

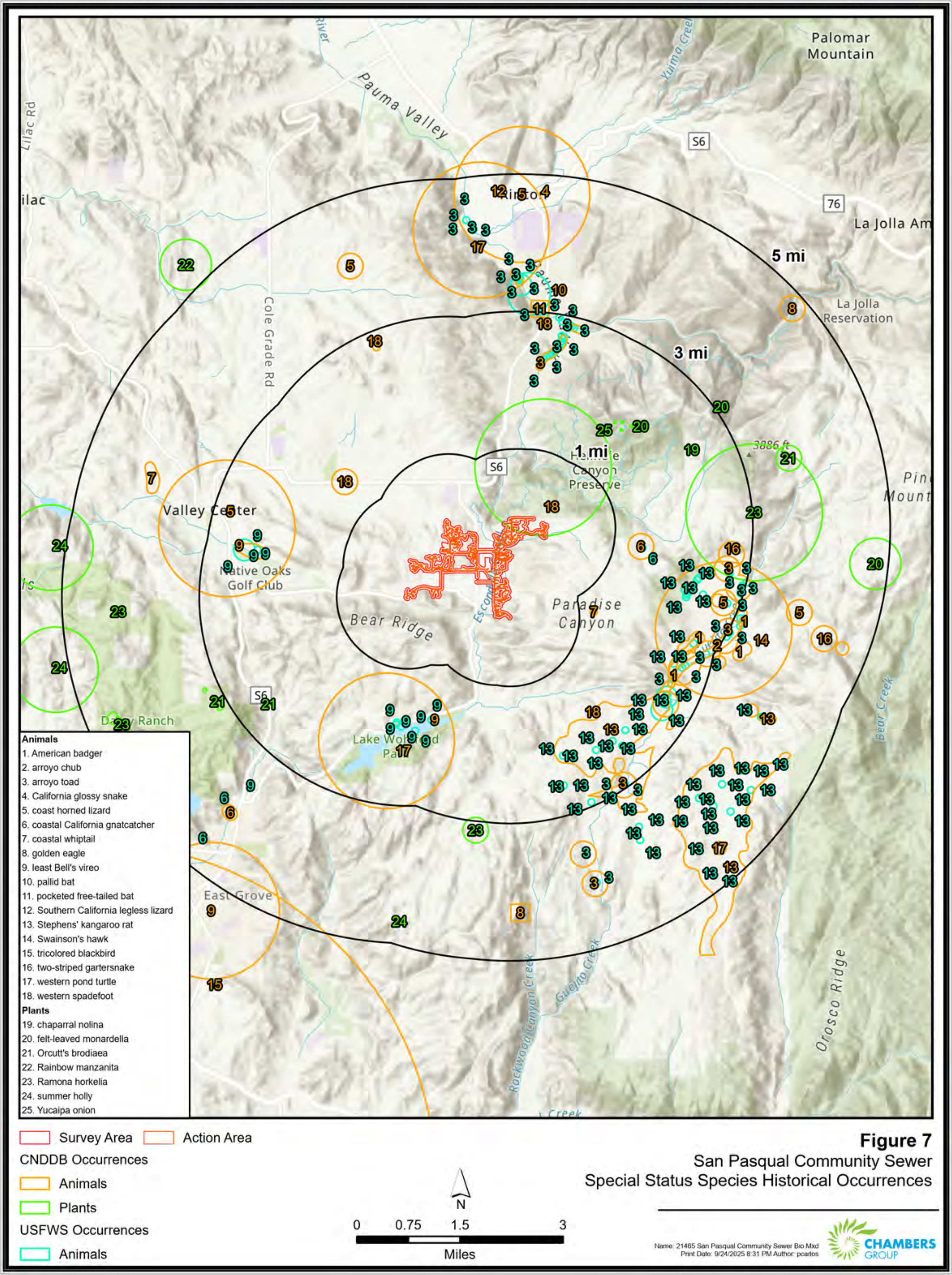
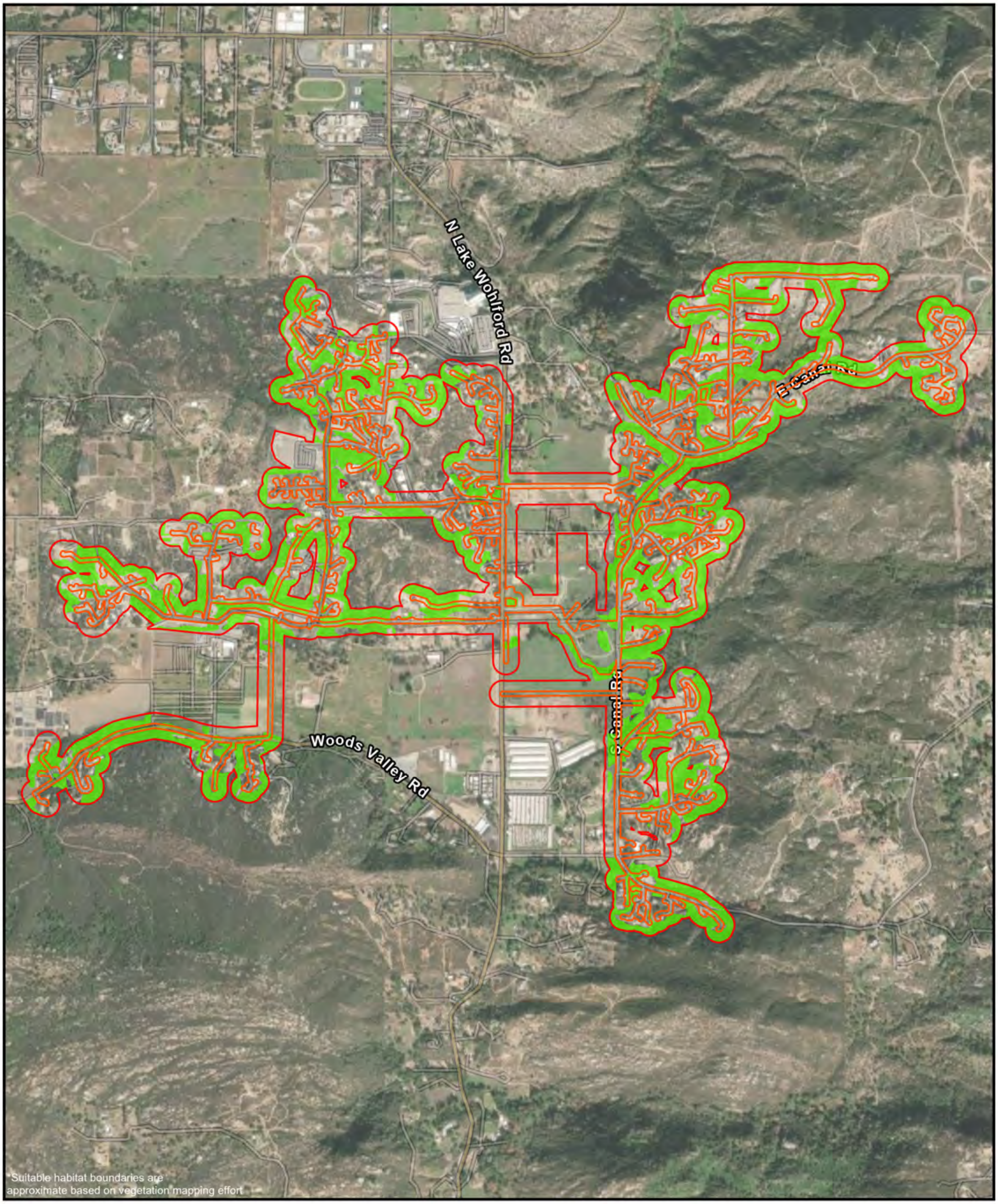


Figure 7
San Pasqual Community Sewer
Special Status Species Historical Occurrences



Survey Area
Action Area
Habitat for Special Status Plants

N

0 700 1,400 2,800
Feet

Figure 8
San Pasqual Community Sewer
Suitable Habitat for Special Status Plant Species*

Name: 21465 San Pasqual Community Sewer Bio.Mxd
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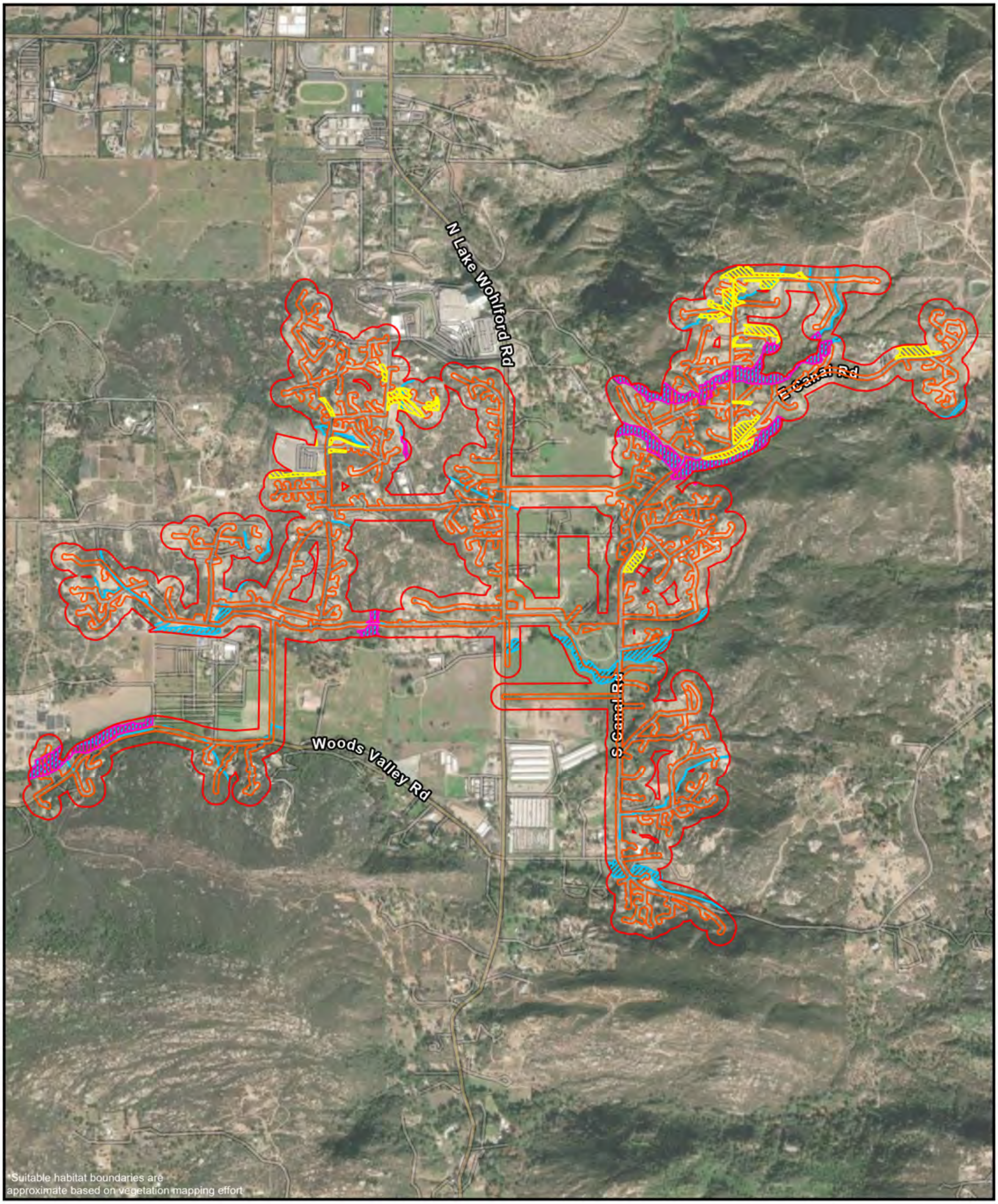

Survey Area

Area of Potential Effects

Habitat for Arroyo Toad

Habitat for Least Bells Vireo

Habitat for Coastal California Gnatcatcher

N

0 700 1,400 2,800

Feet

Figure 9

San Pasqual Community Sewer

Suitable Habitat for Special Status Wildlife Species*

Name: 21465 San Pasqual Community Sewer Bio.Mxd
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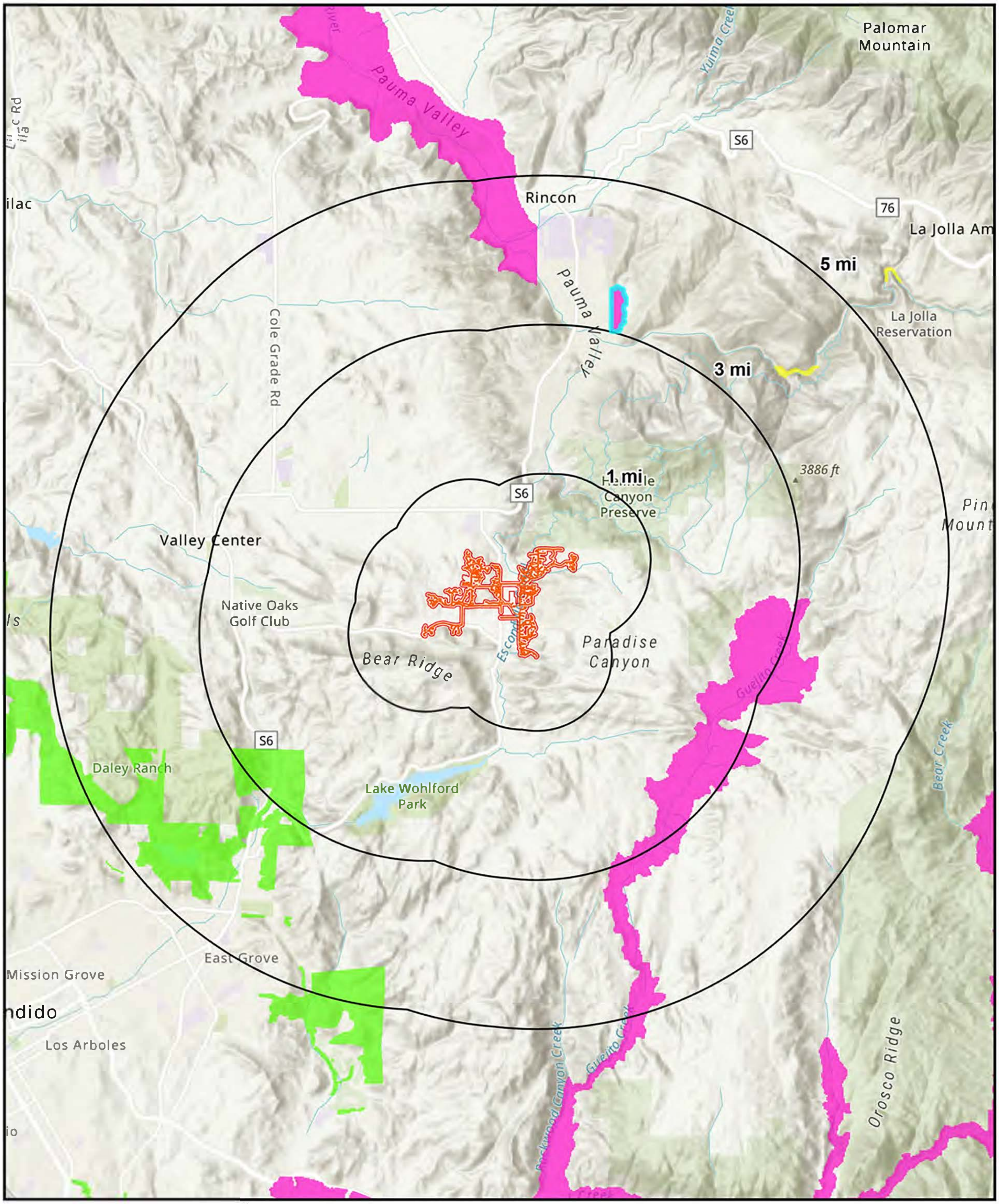

Survey Area

Action Area

USFWS Critical Habitat

Arroyo (=arroyo southwestern) toad

Coastal California gnatcatcher

Southwestern willow flycatcher

N

0 0.75 1.5 3

Miles

Figure 10

San Pasqual Community Sewer

USFWS Critical Habitat

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SECTION 6.0 – CONCLUSIONS AND RECOMMENDATIONS

6.1 POTENTIAL USACE JURISDICTION

Based on the database review and field observations during the delineation, several onsite drainages connect to the San Luis Rey River, a TNW. As defined by the OHWMs, a total of 5.04 acres of potential non-wetland WoUS are present within the Survey Area and are potentially under the jurisdiction of the USACE, including 0.27 acres within Temporary Impact Areas and 0.01 acres within Permanent Impact Areas. Additionally, a total of 12.76 acres of wetland vegetation are present within the Survey Area and are potentially under the jurisdiction of the USACE, including 0.65 acres within Temporary Impact Areas and 0.02 acres within Permanent Impact Areas. Wetland vegetation is dominated by California Sycamore - Coast Live Oak Riparian Woodland and Goodding's Willow - Red Willow Riparian Woodland. The Project has been designed to avoid waters that are under potential USACE jurisdiction to the greatest extent feasible. A Section 404 permit will be required for Project authorization. USACE will review and verify the jurisdictional delineation and determine mitigation requirements for the Project, if applicable. Biological monitoring is recommended to ensure impacts to waters and wetlands potentially under USACE jurisdiction are minimized. Best management practices (BMPs), such as straw wattle and sand bags, are recommended where construction occurs near waters and wetlands to avoid contamination from potential runoff.

6.2 VEGETATION COMMUNITIES

There are approximately 224.53 acres of native vegetation communities and 357.04 acres of other land cover types within the Survey Area. Of the native vegetation present, 28.82 acres are within Temporary Impact Areas and 1.16 acres are within Permanent Impact Areas. The Project has been designed to utilize existing developed areas including roads, bare ground, and disturbed areas to the greatest extent feasible to avoid impacts to native vegetation communities. In order to minimize impacts to native vegetation, biological monitoring is recommended to ensure activities are limited to designated Project temporary and Permanent Impact Areas, and to facilitate staging of equipment away from native vegetation to the greatest extent feasible. Native vegetation within Staging Areas should be flagged for avoidance by a biological monitor in order to utilize bare ground, developed land, and ruderal/disturbed lands for equipment and materials staging.

6.3 SPECIAL STATUS PLANTS

Of the nine special status plant species identified in the literature review, it was determined that four special status plant species were considered absent from the Survey Area, one species has a low PFO, and four species have a **Moderate** PFO.

The four special status plant species with a moderate PFO include: Nevin's barberry, San Diego ambrosia, San Diego thorn-mint, and thread-leaved brodiaea. Chambers Group recommends focused surveys for all four species with a **Moderate** PFO within the Survey Area, during the appropriate blooming period of March to October.

6.4 SPECIAL STATUS WILDLIFE

Of the 10 special status wildlife species identified in the literature review, it was determined that six special status wildlife species were considered **Absent** from the Survey Area, three species have a **Low**

PFO, and one species has a **Moderate** PFO. These conclusions are based on results of the database search and biological reconnaissance survey, as well as negative findings of 2025 protocol-level surveys conducted for coastal California and least Bell's vireo.

Pre-construction surveys for special status species with a PFO within the Survey Area are recommended prior to the initiation of construction. Species-specific measures are recommended for the following special status wildlife species with a **Moderate** PFO: arroyo toad. There is moderately suitable habitat present along several drainages within the Survey Area that may support arroyo toad. USFWS critical habitat is mapped approximately 2.2 miles southeast and 3.0 miles north of the Survey Area. There are USFWS and CNDDB occurrences documented during surveys in 2008 approximately 2.16 miles from the Survey Area and iNaturalist historical occurrences are documented approximately 1,000 feet and 0.4 mile southwest of the Survey Area, east of Lake Wohlford Road and south of Paradise Mountain Road. Avoidance of these areas may be possible through the design of the Project; however, toads can migrate over 1,000 feet into wintering areas (burrows). Therefore, focused surveys are recommended to determine presence/absence of arroyo toads within the Survey Area. If present, biological monitoring will be required. Exclusionary wildlife fencing should be placed around active construction near sensitive habitat areas to avoid impacts to arroyo toad. Daily pre-construction sweeps within the exclusionary fencing by a qualified biologist are recommended prior to the commencement of work.

6.5 MIGRATORY BIRD TREATY ACT

To avoid impacts to nesting birds that are protected by the MBTA, construction should be conducted outside of the nesting season (generally September 1 through January 14). If construction outside the breeding season is not feasible, pre-construction nesting bird surveys should be conducted during the nesting season (generally January 15 through August 31) at least 10 days prior to construction near suitable nesting habitat. Nesting bird surveys shall be conducted within 150 feet for non-listed passerines, 300 feet for special status passerines, and 500 feet for raptors. If an active nest is found of a non-special status species, an appropriate no-work buffer shall be established around the nest by a qualified biologist that takes into account the species, ambient disturbance, perceived tolerance to disturbance of the nest, and planned construction activities including potential direct and indirect impacts (e.g., noise and vibration from construction activities). For special status species that are not listed, a 300-foot buffer shall be established for special status passerines and a 500-foot buffer shall be established for special status raptors. If a listed avian species establishes an active nest during construction, a 500-foot buffer will be established and USFWS shall be notified. Buffer reductions for special status species may be possible on a case-by-case basis if the nest shows a high tolerance to disturbance through coordination with USFWS. Nest buffers shall be established with stakes, flagging, and signage as appropriate to ensure construction personnel do not enter the buffer. Drive-through-only or walk-through-only buffers may be established if a qualified biologist determines that the nest would not be affected by such activities past an active nest.

6.6 NO EFFECT DETERMINATION

The IHS completed informal consultation with the USFWS to discuss requirements under Section 7 of the ESA of 1973, as amended. The USFWS requested that focused surveys be conducted for coastal California gnatcatcher and least Bell's vireo, which Chambers Group completed during the 2025 breeding season and were negative. The IHS subsequently made a No Effect determination and notified the USFWS of their determination. IHS/USFWS informal consultation correspondence is provided in Appendix J.

SECTION 7.0 – REFERENCES

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APPENDIX A – SITE PHOTOGRAPHS

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Photo 1

View of Mission Manzanita Chaparral habitat, taken from behind the Environmental Office, east of Kumeyaay Way. Habitat is dominated by mission manzanita (*Xylococcus bicolor*) and chamise (*Adenostoma fasciculatum*). Photo facing northwest.

Photo 2

View of Mission Manzanita Chaparral habitat with Ruderal vegetation running down the middle of the photograph, taken from behind the Environmental Office, east of Kumeyaay Way. Habitat is dominated by mission manzanita and chamise. Photo facing northwest.

	**Photo 3** View of Mission Manzanita Chaparral habitat, taken from the end of Oos Place, near Drainage 12.1. Habitat is dominated by mission manzanita and chamise. Photo facing south.
	**Photo 4** View of Mission Manzanita Chaparral habitat, taken from Paradise Mountain Road. Habitat is dominated by mission manzanita and chamise. Photo facing northwest.

Photo 5

View of California Buckwheat Scrub habitat, taken from Oos Place, near Drainage 11. The habitat is dominated by California buckwheat (*Eriogonum fasciculatum*) and California sagebrush (*Artemisia californica*). This habitat is suitable for coastal California gnatcatcher (*Polioptila californica californica*; CAGN) nesting and foraging. However, focused surveys conducted for CAGN in 2025 were negative and CAGN can therefore be considered absent from the Project site. Photo facing northeast.

Photo 6

View of California Buckwheat Scrub habitat transitioning into Coast Live Oak Woodland habitat. Photo facing south.

Photo 7

View of California Buckwheat Scrub habitat, taken from the intersection of Kunyaaw Path and Kewaak Way. This habitat is of low quality to support CAGN, and focused surveys conducted for the species in 2025 were negative. Photo facing northeast.

Photo 8

View of California Buckwheat scrub habitat, taken from Hawk Hill Ln. This area is dominated by California bush sunflower (*Encelia californica*) in the foreground and California buckwheat in the background. Photo facing south.

Photo 9

Patch of California Buckwheat Scrub habitat adjacent to developed, bare ground, and ruderal areas, taken from South San Pasqual Rd. California buckwheat present. Photo facing northwest.

Photo 10

Laurel Sumac Scrub habitat adjacent to ornamental vegetation near a residence, taken from Kunyaaw Path. Laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), and California buckwheat present. Photo facing north.

Photo 11

Laurel Sumac Scrub habitat transitioning to Mission Manzanita Chaparral habitat, taken from a dirt road off of Eagle Way. Laurel sumac, black sage, and chamise present. Photo facing south.

Photo 12

View of Hoary Leaf Ceanothus Chaparral habitat behind a residence off Callie Way. Dominated by hoary leaf ceanothus (*Ceanothus crassifolius*). Photo facing east.

	**Photo 13** View of Hoary Leaf Ceanothus Chaparral habitat, behind a Ruderal vegetation area, off Callie Way. Dominated by hoary leaf ceanothus. Photo facing east.
	**Photo 14** Scrub Oak Chaparral habitat, taken from Alvarado Sun Clan Way. Dominated by scrub oak (*Quercus berberidifolia*). Photo facing northeast.

Photo 15

Scrub Oak Chaparral habitat adjacent to a developed area and ornamental vegetation, taken from Hechkulk Way. Dominated by scrub oak. Photo facing southwest.

Photo 16

View of Coast Live Oak Woodland habitat on either side of Woods Valley Rd. Coast live oak (*Quercus agrifolia*) is the dominant plant species in the area. Photo facing northeast.

Photo 17

View of Coast Live Oak Woodland habitat surrounding Escondido Canal off Oos Pl. Dominated by coast live oak. Photo facing south.

Photo 18

View of Coast Live Oak Woodland habitat surrounded by nonnative grassland, taken from S Canal Rd. Dominated by coast live oak and a ruderal area consisting of nonnative grasses. Photo facing southwest.

	**Photo 19** View of Coast Live Oak Woodland habitat adjacent to ruderal, bare ground, and developed areas, taken from Kumeyaay Way. Coast live oak present. Photo facing northwest.
	**Photo 20** View of California Sycamore – Coast Live Oak Riparian Woodland habitat surrounding a wash off of Kewaak Way. Vegetation in the area includes western sycamore (*platanus racemosa*) and coast live oak. Potential arroyo toad and western spadefoot habitat present. Photo facing southwest.

Photo 21

View of California Sycamore – Coast Live Oak Riparian Woodland habitat surrounding a wash off of Kewaak Way. Vegetation in the area includes coast live oak and western sycamore. Potential arroyo toad and western spadefoot habitat is present. Photo facing southeast.

Photo 22

View of California Sycamore – Coast Live Oak Riparian Woodland habitat on either side of Drainage 9 off S Canal Rd. Dominated by coast live oak. Photo facing southwest.

	**Photo 23** Goodding's Willow – Red Willow Riparian Woodland habitat in Drainage 8, taken from Augustine Orosco Ln. Red willow (*Salix laevigata*) present. This habitat is suitable to support foraging southwestern willow flycatcher (*Empidonax traillii extimus*; SWFL) and nesting and foraging least Bell's vireo (*Vireo bellii pusillus*; LBVI). Focused surveys conducted for LBVI in 2025 were negative. Therefore, LBVI can be considered absent from the Project site. Photo facing northeast. Photo facing north.
	**Photo 24** Goodding's Willow – Red Willow Riparian Woodland habitat in Drainage 2 wetland, taken from Woods Valley Rd. Red willow present. This area contains suitable nesting/foraging habitat for LBVI and foraging habitat for SWFL present. Focused surveys for LBVI were conducted in 2025 and were negative. Photo facing north.

Photo 25

Goodding's Willow – Red Willow Riparian Woodland habitat in Drainage 12, taken from Oos Pl. Red willow present. Photo facing west.

Photo 26

View of Mulefat Thicket habitat in the foreground with Mission Manzanita Chaparral habitat in the background, taken from the San Pasqual Tribal Hall parking lot off of South San Pasqual Road. The habitat is dominated by mulefat (*Baccharis salicifolia*). Marginally suitable habitat for LBVI is present. Focused surveys conducted for LBVI in 2025 were negative. Photo facing east.

Photo 27

Cattail Marsh habitat within a topographical depression, likely an old cow pond, adjacent to a developed area, taken from North Lake Wohlford Rd. Dominated by broad-leafed cattail (*Typha latifolia*). Photo facing north.

Photo 28

Cattail Marsh habitat within an old cow pond adjacent to a developed area, taken from North Lake Wohlford Rd. Dominated by broad-leafed cattail. Photo facing east.

	**Photo 29** View of Rocky Outcrop off of Kewaak Way. Vegetation present includes chaparral yucca (*Hesperoyucca whipple*i), Engelmann's prickly-pear (*Opuntia engelmannii var. engelmannii*), blue-eye Cape-marigold (*Dimorphotheca sinuata*), and nonnative grasses. Photo facing west.
	**Photo 30** View of Rocky Outcrop off of Kewaak Way. Vegetation present includes laurel sumac, silver leaf lotus (*Lotus argophyllus*), and nonnative grasses. Photo facing southeast.

	**Photo 31** View of Drainage 1, south of Woods Valley Road. The drainage was confirmed to be outside the Survey Area. Vegetation present included coast live oak. Photo facing southeast.
	**Photo 32** View of Drainage 2, north of Woods Valley Road. Vegetation present included coast live oak. Photo facing southwest.

Photo 33

View Drainage 3 flowing into Drainage 2. It was confirmed that Drainage 3 is outside the Survey Area. Photo facing northwest.

Photo 34

Soil Pit 1 at the eastern portion of Drainage 2. Soils were found to be non-hydric. Photo facing northeast.

Photo 35

Soil Pit 1 is surrounded by beardless wild rye and willows (*Salix* spp.) along the southern side of Drainage 2. Photo facing northwest.

Photo 36

View of Drainage 5.1 on the west side of Kewaak Way. Vegetation included mulefat. Photo facing northwest.

Photo 37

View of Drainage 5 on the east side of Kewaak Way. Vegetation included mulefat and willows. Photo facing northwest.

Photo 38

View of Drainage 5 on the east side of Kewaak Way. Vegetation included iceplant (*Carpobrotus* sp.). Photo facing southwest.

Photo 39

View of Drainage 5 south of Kewaak Way. Vegetation was dominated by coast live oak with blue elderberry (*Sambucus mexicana*) intermixed. Photo facing southeast.

Photo 40

View of Drainage 5 south of Kewaak Way. There was ruderal vegetation surrounding the drainage. Photo facing southwest.

Photo 41

View of the upslope end of Drainage 6, within the Survey Area. Photo facing north.

Photo 42

View of Drainage 6. Vegetation included coast live oak with an understory of mule fat. Photo facing northeast.

	**Photo 43** View of Drainage 6 after it crosses south of Kewaak Way. Vegetation included coast live oak. Photo facing west.
	**Photo 44** View Drainage 7, east of Kumeyaay Way. Mixed chaparral species and stinkwort (*Dittrichia graveolens*) surround the drainage. Photo facing east.

	**Photo 45** View Drainage 7, west of Kumeyaay Way. Mixed chaparral and ornamental vegetation canopy is overgrown over the drainage. Photo facing west.
	**Photo 46** Start of Drainage 8, near the intersection of Kunyaaw Path and Kumeyaay Way. Photo facing west.

Photo 47

View of Drainage 8, north of Agustine Orosco Lane. Vegetation included willows and mulefat. Photo facing north.

Photo 48

View of Drainage 9 at North Lake Wohlford Road. Vegetation was dominated by coast live oak, with eucalyptus intermixed. Photo facing northeast.

Photo 49

View of Drainage 9 at South Canal Road. Vegetation was dominated by coast live oak. Photo facing southwest.

Photo 50

View of Drainage 10, the Escondido Canal, north of Iipay Lane It was discovered that the Escondido Canal was undergrounded. Vegetation was dominated by coast live oak, beside the straw wattles from the canal activities. Photo facing southwest.

Photo 51

View of Drainage 11, south of Oos Place. Vegetation present included chamise, laurel sumac, and black sage. Photo facing southwest.

Photo 52

View of Drainage 12 east of Oos Place. Vegetation present included coast live oak and willows. Photo facing southwest.

	**Photo 53** View of Drainage 12.1 east of Oos Place, and surrounded by chaparral. Photo facing east.
	**Photo 54** View of Drainage 12.1 further downslope. Drainage is surrounded by chaparral vegetation. Photo facing south.

Photo 55

View of Drainage 15, south of Canal Road. Vegetation present included mulefat, cattail, cocklebur (*Xanthium strumarium*), and willows. Photo facing east.

Photo 56

View of Drainage 18, north of Paradise Mountain Road. Vegetation included coast live oak and California sycamore (*Platanus racemosa*). Photo facing southwest.

Photo 57

View of Drainage 18, west of Paradise Mountain Road. Vegetation included coast live oak. Photo facing northwest.

APPENDIX B – PLANT SPECIES OBSERVED

APPENDIX B – PLANT SPECIES OBSERVED

Scientific Name	Common Name
LYCOPHYTES	
SELAGINELLACEAE	**Spike-Moss Family**
Selaginella bigelovii	Bigelow's spike-moss
FERNS	
SELAGINELLACEAE	**SPIKE-MOSS FAMILY**
Selaginella cinerascens	ashy spike-moss
GYMNOSPERMS	
CUPRESSACEAE	**CYPRESS FAMILY**
*Cupressus sempervirens**	Italian cypress
MAGNOLIIDS	
SAURURACEAE	**LIZARD'S-TAIL FAMILY**
Anemopsis californica	yerba mansa
ANGIOSPERMS (EUDICOTS)	
ADOXACEAE	**MUSKROOT FAMILY**
Sambucus mexicana	blue elderberry
AIZOACEAE	**FIG-MARIGOLD FAMILY**
Carpobrotus sp.*	iceplant
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**
Malosma laurina	laurel sumac
Rhus ovata	sugar bush
*Schinus terebinthifolius**	Brazilian pepper tree
Toxicodendron diversilobum	poison oak
ASTERACEAE	**SUNFLOWER FAMILY**
Anaphalis margaritacea	pearly everlasting
Artemisia californica	California sagebrush
Baccharis salicifolia subsp. *salicifolia*	mule fat
Baccharis sarothroides	broom baccharis
*Centaurea melitensis**	tocalote
Corethrogyne filaginifolia	sand-aster
*Dimorphotheca sinuata**	blue-eye cape-marigold
*Dittrichia graveolens**	stinkwort
Encelia californica	California bush sunflower
Eriophyllum confertiflorum	golden yarrow
Hazardia sp.	goldenbush
*Helminthotheca echioides**	bristly oxtongue
Heterotheca grandiflora	telegraph weed
*Oncosiphon piluliferum**	globe chamomile
Sonchus asper subsp. *asper**	prickly sow thistle
*Sonchus oleraceus**	common sow thistle
Xanthium strumarium	cocklebur

Scientific Name	Common Name
BIGNONIACEAE	**BIGNONIA FAMILY**
*Jacaranda mimosifolia**	jacaranda
BRASSICACEAE	**MUSTARD FAMILY**
*Brassica rapa**	field mustard
*Hirschfeldia incana**	shortpod mustard
Nasturtium officinale	water-cress
*Sisymbrium irio**	London rocket
CACTACEAE	**CACTUS FAMILY**
Opuntia engelmannii var. *engelmannii*	engelmann's prickly-pear
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Lonicera subspicata	southern honeysuckle
CUCURBITACEAE	**GOURD FAMILY**
Marah macrocarpa	wild cucumber
ERICACEAE	**HEATH FAMILY**
Arctostaphylos sp.	manzanita
Xylococcus bicolor	mission manzanita
FABACEAE	**LEGUME FAMILY**
Acmispon argophyllus	silver leaf lotus
Acmispon glaber	deerweed
Gleditsia triacanthos	honey locust
Vicia sativa subsp. *nigra**	narrow-leaf vetch, common vetch
FAGACEAE	**OAK FAMILY**
Quercus agrifolia	coast live oak
Quercus berberidifolia	scrub oak
Quercus engelmannii	Engelmann oak
Quercus lobata	valley oak
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	broad-lobed filaree
*Erodium cicutarium**	red-stemmed filaree
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Phacelia tanacetifolia	tansy phacelia
LAMIACEAE	**MINT FAMILY**
Salvia clevelandii	fragrant sage
Salvia columbariae	chia
Salvia mellifera	black sage
MALVACEAE	**MALLOW FAMILY**
*Malva parviflora**	cheeseweed
MONTIACEAE	**MINER'S LETTUCE FAMILY**
Calandrinia menziesii	red maids
Claytonia perfoliata	Miner's lettuce
MYRTACEAE	**MYRTLE FAMILY**
*Eucalyptus globulus**	blue gum

Scientific Name	Common Name
*Eucalyptus pulverulenta**	silver dollar eucalyptus
NAMACEAE	**NAMA FAMILY**
Eriodictyon crassifolium	thick-leaved yerba santa
OLEACEAE	**OLIVE FAMILY**
*Olea europaea**	olive
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Epilobium ciliatum	California cottonweed
Eulobus californicus	California evening primrose
OXALIDACEAE	**OXALIS FAMILY**
*Oxalis pes-caprae**	Bermuda buttercup
Pedicularis densiflora	Indian warrior
PAEONIACEAE	**PEONY FAMILY**
Paeonia californica	California peony
PLANTAGINACEAE	**PLANTAIN FAMILY**
Keckiella antirrhinoides	chaparral beard-tongue
Keckiella cordifolia	heart leaved keckiella
PLATANACEAE	**SYCAMORE FAMILY**
Platanus racemosa	California sycamore
Platanus x hispanica	London plane
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum	California buckwheat
Rumex obtusifolius *	bitter dock
Rumex sp.	dock
RHAMNACEAE	**BUCKTHORN FAMILY**
Ceanothus crassifolius	hoary leaf ceanothus
Ceanothus leucodermis	chaparral whitethorn
Ceanothus tomentosus	woolly-leaved ceanothus
Rhamnus ilicifolia	holly-leaf redberry
ROSACEAE	**ROSE FAMILY**
Adenostoma fasciculatum	chamise
Cercocarpus minutiflorus	smooth mountain-mahogany
Prunus ilicifolia	holly-leaf cherry
Rosa californica	California wild rose
SALICACEAE	**WILLOW FAMILY**
Salix laevigata	red willow
SCROPHULARIACEAE	**FIGWORT FAMILY**
Scrophularia californica	California figwort
SOLANACEAE	**NIGHTSHADE FAMILY**
*Nicotiana glauca**	tree tobacco
Solanum xanti	chaparral nightshade
TAMARICACEAE	**TAMARISK FAMILY**
*Tamarix chinensis**	tamarisk

Scientific Name	Common Name
URTICACEAE	**NETTLE FAMILY**
Urtica dioica	stinging nettle
*Urtica urens**	dwarf nettle
ANGIOSPERMS (MONOCOTS)	
AGAVACEAE	**AGAVE FAMILY**
Hesperoyucca whipplei	chaparral yucca
ARECACEAE	**PALM FAMILY**
Arecastrum sp.*	palm
CYPERACEAE	**SEDGE FAMILY**
Carex spissa	San Diego sedge
Cyperus eragrostis	tall cyperus
*Cyperus involucratus**	umbrella-plant
JUNCACEAE	**RUSH FAMILY**
Juncus acutus subsp. *leopoldii*	spiny rush
Juncus sp.	rush
POACEAE	**GRASS FAMILY**
*Arundo donax**	giant reed
*Bromus diandrus**	ripgut grass
Bromus madritensis subsp. *madritensis**	foxtail chess
Elymus triticoides	beardless wild rye
Melinis repens subsp. *repens**	natal grass
*Pennisetum setaceum**	fountain grass
TYPHACEAE	**CATTAIL FAMILY**
Typha latifolia	broad-leaved cattail

*Non-Native Species, +Ornamental, Unlikely to be Invasive

APPENDIX C – WILDLIFE SPECIES DETECTED

APPENDIX C – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
CLASS AMPHIBIA	**AMPHIBIANS**
HYLIDAE	**TREEFROGS**
Pseudacris cadaverina	California chorus frog
Pseudacris regilla	Pacific chorus frog
CLASS REPTILIA	**REPTILES**
PHRYNOSOMATIDAE	**ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS**
Sceloporus occidentalis	western fence lizard
CLASS AVES	**BIRDS**
ANATIDAE	**DUCKS, GEESE, SWANS**
Anas platyrhynchos	mallard
Anser caerulescens	snow goose
Cygnus sp.	swan
Mareca americana	American wigeon
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
PHASIANIDAE	**PARTRIDGES, GROUSE, TURKEYS**
Gallus gallus domesticus	domestic chicken
Pavo cristatus	Indian peafowl
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
COLUMBIDAE	**PIGEONS & DOVES**
Zenaida macroura	mourning dove
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
Selasphorus sasin	Allen's hummingbird
PICIDAE	**WOODPECKERS**
Colaptes auratus	northern flicker
Dryobates nuttallii	Nuttall's woodpecker
Melanerpes formicivorus	acorn woodpecker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Contopus sordidulus	western wood-pewee
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	western kingbird
CORVIDAE	**JAYS & CROWS**
Aphelocoma californica	California scrub-jay

Scientific Name	Common Name
Corvus brachyrhynchos	American crow
Corvus corax	common raven
PARIDAE	**CHICKADEES, TITMICE**
Baeolophus inornatus	oak titmouse
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
SITTIDAE	**NUTHATCHES**
Sitta carolinensis	white-breasted nuthatch
TROGLODYTIDAE	**WRENS**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
SYLVIIDAE	**OLD WORLD WARBLERS**
Chamaea fasciata	wrentit
TURDIDAE	**THRUSHES**
Catharus guttatus	hermit thrush
Sialia mexicana	western bluebird
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
STURNIDAE	**STARLINGS**
Sturnus vulgaris	European starling
PARULIDAE	**WOOD WARBLERS**
Leiothlypis celata	orange-crowned warbler
Setophaga coronata	yellow-rumped warbler
ICTERIDAE	**BLACKBIRDS**
Euphagus cyanocephalus	Brewer's blackbird
Sturnella neglecta	western meadowlark
PASSERELLIDAE	**NEW WORLD SPARROWS**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
FRINGILLIDAE	**FINCHES**
Haemorhous mexicanus	house finch
Spinus psaltria	lesser goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
CASUARIIDAE	**CASSOWARIES AND EMUS**
Dromaius novaehollandiae	emu
CLASS MAMMALIA	**MAMMALS**
SCIURIDAE	**SQUIRRELS**
Spermophilus beecheyi	California ground squirrel
MURIDAE	**MICE, RATS, AND VOLES**
Neotoma lepida	desert woodrat

Scientific Name	Common Name
CANIDAE	**WOLVES & FOXES**
Canis familiaris	domestic dog
FELIDAE	**CATS**
Felis catus	domestic cat
EQUIDAE	**HORSES & BURROS**
Equus caballus	horse
Equus africanus asinus	donkey
BOVIDAE	**BISON, GOATS & SHEEP**
Capra hircus	domestic goat

APPENDIX D – SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

APPENDIX D - SPECIAL STATUS PLANT SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

Common Name (*Scientific Name*)	Status: Federally listed Endangered (FE) or Federally listed Threatened (FT)	Flowering Season	Habitat and Distribution	Potential for Occurrence (PFO)
Encinitas baccharis (*Baccharis vanessae*)	FT	August-November	Perennial deciduous shrub. Occurs in chaparral (maritime) and cismontane woodland habitats with sandstone soils. Can be found at elevations between 200 and 2,360 feet.	This species is considered **absent** within the Survey Area. Cismontane woodland habitat with sandstone soils does not occur within the Survey Area, though the Survey Area is within the elevation range of the species.
Nevin's barberry (*Berberis nevinii*)	FE	March-June	Evergreen shrub. Found naturally in sometimes gravelly or sandy soils in chaparral, cismontane woodland, coastal scrub, and riparian scrub habitat but is widely cultivated in gardens and parks. Can be found at elevations between 230 and 2,705 feet.	This species has a **moderate** potential for occurrence within the Survey Area. Chaparral, cismontane woodland, and coastal scrub habitat occurs within the Survey Area and the Survey Area is within the elevation range of the species, but historical records of the species are not documented within 5 miles of the Survey Area.
salt marsh bird's-beak (*Chloropyron maritimum* subsp. *maritimum*)	FE	May-October	Annual herb. Occurs in coastal saltmarsh and coastal dune habitat. Can be found at elevations below 100 feet.	This species is presumed **absent** from the Survey Area. Coastal saltmarsh and coastal dune habitats are not present within the Survey Area and is not within the elevation range of the species.
San Bernardino blue grass (*Poa atropurpurea*)	FE	May-July	Rhizomatous perennial herb. Occurs in mesic soils in meadows and seeps. Can be found at elevations between 4,460 and 8,055 feet.	This species is presumed **absent** from the Survey Area. Meadows and seeps with mesic soils are not present within the Survey Area and the Survey Area is not within the elevation range of the species.

Common Name (*Scientific Name*)	Status: Federally listed Endangered (FE) or Federally listed Threatened (FT)	Flowering Season	Habitat and Distribution	Potential for Occurrence (PFO)
San Diego ambrosia (*Ambrosia pumila*)	FE	April-October	Perennial rhizomatous herb. Occurs often in disturbed areas, sometimes in alkaline, sandy clay loam soils in chaparral, coastal scrub, valley and foothill grassland, and vernal pool habitats. Can be found at elevations between 65 and 1,360 feet.	This species has a **moderate** potential for occurrence within the Survey Area. Sandy clay loam soils within chaparral and coastal scrub habitat is present, and one historical record of occurrence is documented approximately 3.9 miles southwest of Survey Area from 2017.
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	FE	April-June	Annual or perennial herb. This species can be found mesic soils of coastal scrub, valley and foothill grassland, and vernal pools. San Diego button-celery can be found at elevations between 65 and 2,035 feet.	This species is presumed **absent** from the Survey Area. Mesic soils within coastal scrub habitat are not present within the Survey Area and historical records of the species are not documented within 5 miles of the Survey Area.
San Diego thorn-mint (*Acanthomintha ilicifolia*)	FT	April-June	Annual herb. Occurs in clay soils and openings in chaparral, coastal scrub, valley and foothill grassland, and vernal pools. Can be found at elevations between 33 and 3,150 feet.	This species has a **moderate** potential for occurrence within the Survey Area. Clay soils within chaparral and coastal scrub habitat is present in the Survey Area. Five historical records of occurrence are documented within four miles south and southeast of the Survey Area from 2023, the closest being approximately 0.7 mile southeast.

Common Name (*Scientific Name*)	Status: Federally listed Endangered (FE) or Federally listed Threatened (FT)	Flowering Season	Habitat and Distribution	Potential for Occurrence (PFO)
spreading navarretia (*Navarretia fossalis*)	FT	April-June	Annual herb. This species is found growing in chenopod scrub, marshes and swamps, playas, and vernal pools at elevations between 100 and 2,150 feet.	This species has a **low** potential for occurrence within the Survey Area. Disturbed cattail marsh habitat is present within the Survey Area and historical records of occurrence are not documented within 5 miles of the Survey Area.
thread-leaved brodiaea *(Brodiaea filifolia)*	FT	March-June	Perennial bulbiferous herb. This species is found often in clay soil in openings in chaparral habitat, cismontane woodland, coastal scrub, playas, valley and foothill grassland, and vernal pools. Typically found at elevations between 80 and 3,675 feet.	This species has a **moderate** potential for occurrence within the Survey Area. Clay soils within chaparral, cismontane woodland, and coastal scrub habitat are present within the Survey Area and are within the elevation range of the species. Six historical records of occurrence are documented within five miles of the Survey Area from 2019 to 2022, with the closest being approximately 1.1 miles southwest of the Survey Area in 2022.

APPENDIX E – SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

APPENDIX E – SPECIAL STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

Common Name (*Scientific Name*)	Status: Federal	Habitat and Distribution	Potential for Occurrence (PFO)
CLASS AMPHIBIA			
arroyo toad (*Anaxyrus californicus*)	FE	Found in washes, streams, and arroyos. Preferred habitats include sandy banks within riparian woodlands such as willow, cottonwood, sycamore, mule fat, and/or coast live oak. Breeds in shallow, sandy or gravelly riverine pools with low silt content, and normally disperses onto adjacent uplands after breeding.	This species has a **moderate** potential to occur within the Survey Area. There are United States Fish and Wildlife (USFWS) and California Natural Diversity Database (CNDDB) occurrences documented during surveys in 2008 as close as 2.16 miles from the Survey Area. In addition, there are research-grade iNaturalist historical occurrences documented approximately 1,000 feet and 0.4 mile southwest of the Survey Area, east of Lake Wohlford Road and south of Paradise Mountain Road. While the Survey Area does not occur within critical habitat for the arroyo toad, USFWS critical habitat is mapped approximately 2.2 miles southeast and 3.0 miles north of the Survey Area. There is moderately suitable habitat present along several drainages within the Survey Area that may support this species.
western spadefoot (*Spea hammondii*)	FPT	Found in mixed woodland, grassland, coastal sage scrub, and chaparral habitats, along with floodplains, washes, and playas. It prefers sparsely vegetated areas with sandy or gravelly soils and is associated with vernal pools. Breeds in temporary pools. Diet consists of invertebrates, beetles, moths, earthworms, crickets, flies, and ants.	This species has a **low** potential to occur with the Survey Area. There are five CNDDB historical occurrences documented within 3 miles of the Proposed Project, one of which is 0.25 miles from the Survey Area where hundreds of tadpoles were observed in the spring of 2019. Several additional research-grade iNaturalist historical records of occurrence were documented in 2023-2024 less than 1 mile south of the Survey Area. The central portion of the Survey Area contains moderately suitable sparsely vegetated habitat adjacent to dirt roads and agricultural fields that could support this species. Vernal pool habitat was not observed within the Survey Area.

Common Name (*Scientific Name*)	Status: Federal	Habitat and Distribution	Potential for Occurrence (PFO)
CLASS REPTILIA			
western pond turtle (*Emys marmorata*)	FPT	Inhabits permanent or nearly permanent bodies of water in ponds, marshes, rivers, and streams that typically have a rocky or muddy bottom and extensive aquatic vegetation along water body margins. Requires basking sites such as partially submerged logs, vegetation mats, or open mud banks for thermoregulation. While it is considered aquatic, it leaves the water to reproduce, estivate, and overwinter.	This species is presumed **absent** from the Survey Area. There are 3 CNDDB historical occurrences documented within 5 miles of the Survey Area. These occurrences were at sites of permanent water including Lake Wohlford, San Luis Rey River, and Guejito Creek. The Survey Area lacks suitable permanent bodies of water with basking sites needed to support this species.
CLASS AVES			
bald eagle (*Haliaeetus leucocephalus*)	BCC (nesting and wintering)	Prefers forested areas adjacent to large bodies of water, nesting primarily in large trees and on platforms and sometimes on cliff faces. Diet consists of mostly fish but will also take small mammals, amphibians, invertebrates, reptiles, and even garbage.	This species is presumed **absent** from the Survey Area for nesting, although it may be seen as a flyover due to the proximity of a documented nest site. There are no CNDDB or USFWS historical occurrences documented within 5 miles of the Survey Area; however, there are research-grade iNaturalist documented occurrences of bald eagles nesting less than 2 miles south of the Survey Area, at Lake Wohlford. The Survey Area lacks suitable forested habitat and large bodies of water needed to support this species. Therefore, this species is expected to stay close to Lake Wohlford when in the Project vicinity, where habitat requirements are met.

Common Name (*Scientific Name*)	Status: Federal	Habitat and Distribution	Potential for Occurrence (PFO)
coastal California gnatcatcher (*Polioptila californica californica*)	FT	An obligate, permanent resident of coastal sage scrub below 2,500 feet in elevation in Southern California. Found in low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	This species is considered **Absent** from the Survey Area. There are 2 CNDDB and 3 USFWS historical occurrences within 5 miles of the Survey Area, approximately 1.2 miles northeast and 3.9 miles southwest. While the Survey Area does not occur within critical habitat for the coastal California gnatcatcher, there is critical habitat mapped for this species approximately 2.2 miles southwest of the Survey Area. Patches of moderately suitable coastal sage scrub habitat are present throughout the Survey Area. However, focused surveys for this species conducted by Chambers Group in 2025 were negative; therefore, the species can be considered absent.
least Bell's vireo (*Vireo bellii pusillus*)	FE (nesting)	Occurs in early-successional habitats along rivers with low, dense vegetation. Diet consists of insects and spiders. Requires densely vegetated riparian habitat along streams and rivers for nesting.	This species is considered **Absent** from the Survey Area. There are 16 CNDDB/USFWS historical occurrences documented within 5 miles of the Survey Area, primarily at Lake Wohlford Park to the south and along the Moosa Canyon Stream system to the west. The closest historical occurrence was 1.7 miles southwest of the Survey Area in 2009. Patches of moderately suitable riparian habitat are present, particularly in the northeastern and southwestern portions of the Survey Area. However, focused surveys for this species conducted by Chambers Group in 2025 were negative; therefore, the species can be considered absent.
southwestern willow flycatcher (*Empidonax traillii extimus*)	FE (nesting)	Breeds in a variety of riparian habitats with multi-tiered canopies and surface water, and/or saturated soils along streams. Habitat types may include a variety of willow, cottonwood, coast live oak, alder, and tamarisk woodlands.	This species is presumed **absent** from the Survey Area for **nesting** and has a low potential to forage through the Survey Area during migration. While the Survey Area does not occur within critical habitat of the southwestern willow flycatcher, there is critical habitat mapped for this species approximately 3.6 miles northeast of the Survey Area. There are no CNDDB or USFWS historical occurrences of the species within 5 miles of the Survey Area. The Survey Area contains a limited amount of suitable riparian habitat for foraging in the central and

Common Name (*Scientific Name*)	Status: Federal	Habitat and Distribution	Potential for Occurrence (PFO)
			northeastern portions of the Survey Area. The Survey Area lacks suitable nesting habitat to support this species.
Swainson's hawk (*Buteo swainsoni*)	BCC (nesting)	Swainson's Hawks favor open habitats for foraging including grasslands, but also use sage flats and even swaths of agriculture intermixed with native habitat. Nesting trees include willow, black locust, oak, aspen, cottonwood, and conifers. This species occurs as a migrant and/or resident over most of the United States from southern Canada to northern Mexico.	This species is presumed **absent** from the Survey Area for **nesting** and has a low potential to flyover the Survey Area during migration. There is one CNDDB historical occurrence documented within 5 miles of the Survey Area from over 100 years ago and the Survey Area contains a limited amount of low suitability oak woodland habitat in the southern and southeastern portion of the Survey Area that could potentially support this species.
tricolored blackbird (*Agelaius tricolor*)	BCC (nesting colony)	Forms large breeding colonies in emergent wetlands with tall, dense cattails or tules, and in thickets of willow, blackberry, wild rose, or tall, dense forbs. Requires open, accessible water, protective nesting vegetation, and suitable foraging habitat with insect prey, seeds, and cultivated oats.	This species is presumed **absent** from the Survey Area for foraging and **nesting**. There is just 1 CNDDB historical occurrence documented within 5 miles of the Survey Area from 1906. The Survey Area lacks suitable wetland habitat needed to support a nesting colony of this species.
CLASS MAMMALIA			
Stephens' kangaroo rat (*Dipodomys stephensi*)	FT	Found in open grasslands and spare areas of sage scrub habitat. Prefers well-drained, gravelly or sandy soils for digging its burrows.	This species has a **low** potential to occur within the Survey Area. There are 3 CNDDB and 64 USFWS historical occurrences within 5 miles of the Survey Area. There is limited suitable open sage scrub habitat and grassland adjacent to dirt roads within the Survey Area that could support Stephens' kangaroo rat burrows.

Notes: FE: federally listed as endangered; FT: federally listed as threatened; FPT: federally proposed for listing as threatened BCC: USFWS Birds of Conservation Concern

APPENDIX F – OHWM DATASHEETS

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #:	Site Name: San Pasqual Sewer	Date and Time: 2/22/24 9:29
Location (lat/long): 33.2048544°, -116.9889192	Investigator(s): E. Olmos, L. Gorman	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
Drainage channel for stormwater. Recent rain within past days

Step 2 Site conditions during field assessment
First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc. Natural, relatively undisturbed, creek with approx. 3 ft wide stream of water flowing westward. Asphalt riprap on edges of OHWM. Culvert under private dirt road running North to South. Well developed mature coast live oak canopy.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.
OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.
OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: ______
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* sand to sandy silt
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**
  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs)*. ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***
  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #:

Step 5 Describe rationale for location of OHWM

There is a distinct change in soils from sandy within the stream to sandy silt on the banks. Leaf litter from coast live oak canopy missing/washed away from the lower portion of the bank slope.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not:

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX
Approval Expires:

Project ID #:	Site Name: San Pasqual Sewer	Date and Time: 2/27/24 9:23
Location (lat/long):	Investigator(s): E. Olmos	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
stormwater drainage channel beside paved road. Rain event occurred within past week.

Step 2 Site conditions during field assessment
First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc. Manipulated drainage channel between a paved road and residential property. Culverts divert stormwater under the road and driveways. 11 ft wide channel (flat-bottomed), with steep bank slope.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.
OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.
OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [ ] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: ______
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
  - [x] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* sands *to* sandy loam
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**
  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***
  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #:

Step 5 Describe rationale for location of OHWM

The OHWM location was determined based on the undercutting of the bank and steep channel slope up to the bank. Leaf litter was missing from the drainage bed, evidence that it was washed away during the recent rain event. Vegetation is absent from the channel bed and vegetation is beginning to grow on the banks.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not:

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #:	Site Name: San Pasqual Sewer	Date and Time: 3/6/24 10:47
Location (lat/long): 33.217517, -116.962428	Investigator(s): E. Olmos, L. Gorman	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc. Relatively undisturbed natural creek with waters generally flowing southwest. Located in coast live oak woodland with scattered willows. Has an approximately 41 ft OHWM width.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [ ] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: ______
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [x] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* ____ to ____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

  Check the appropriate boxes and select the general vegetation change (*e.g., graminoids to woody shrubs). **Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [ ] *vegetation absent to:*
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [x] *graminoids to:* woody shrubs
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [x] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #:

Step 5 Describe rationale for location of OHWM

There is a distinct change in vegetation to upland woody shrubs above the OHWM. The vegetation in the stream had water staining on the trunks. Debris wracking and litter was observed on the banks and stuck at locations across the stream.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not: ____________

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

APPENDIX G – WETLAND DELINEATION DATASHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Pasqual Sewer City/County: San Diego County Sampling Date: 2/22/2024

Applicant/Owner: ______ State: CA Sampling Point: 1

Investigator(s): L. Gorman, E. Olmos Section, Township, Range: ______

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): ______ Lat: 32.205699 Long: -116.987119 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	

Remarks: Floodplain terrace dominated by Leymus triticoides. No other species around soil pit. Uniform soil color and water seeping into soil pit, indicating high water table.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Leymus triticoides	100	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 1 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	100	x 3 = 300
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	300 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: ______

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______
Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:
uniform color. No redox features and a lot of vegetative material throughout.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

__ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Plowed Soils (C6)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Thin Muck Surface (C7)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ______
Water Table Present? Yes X No ____ Depth (inches): 14
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Pasqual Sewer Project City/County: Valley Center, San Diego county Sampling Date: 3/6/24

Applicant/Owner: ______ State: CA Sampling Point: 2

Investigator(s): L. Gorman, P. Morrissey, E. Olmos Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: 33.215314 Long: -116.965618 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix (red willow)	80	Y	FACW
2.			
3.			
4.			
Total Cover:	80		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Rumex obtusifolius	15	N	FAC
2. water cress	20	Y	OBL
3. umbrella sedge	15	N	OBL
4. bristly oxtongue	5	N	FAC
5. stinging nettle	2	N	FAC
6. nonnative grass	25	Y	UPL
7.			
8.			
Total Cover:	82		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	35	x 1 = 35
FACW species	80	x 2 = 160
FAC species	22	x 3 = 66
FACU species	Ø	x 4 = Ø
UPL species	25	x 5 = 125
Column Totals:	162 (A)	386 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	92	2.5YR 4/6	8	C	M	Silty clay loam	faint mottling
8-12	10YR 2/1	80	2.5YR 4/6	20	C	M	clay loam	
12-16	2.5/N	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1

Water Table Present? Yes X No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 7

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Pasqual Sewer Project City/County: Valley Center / San Diego County Sampling Date: 3/6/24

Applicant/Owner: ______ State: CA Sampling Point: 3

Investigator(s): E. Olmos, M. Speegle Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): 5

Subregion (LRR): ______ Lat: 33.214582 Long: -116.964404 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?		X
Is the Sampled Area within a Wetland?		X

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Rhus ovata	5	Y	UPL
2. Keckiella cordifolia	10	Y	UPL
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum			
1. Sonchus asper	20	N	FAC
2. common vetch	5	N	FACU
3. Sonchus oleraceous	3	N	UPL
4. Brassica rapa	3	N	FACU
5. nonnative grasses	40	Y	UPL
6. Hirshfeldia incana	2	N	UPL
7. Erodium botrys	50	Y	FACU
8.			
Total Cover:	123		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 1 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	Ø	x 1 = Ø
FACW species	Ø	x 2 = Ø
FAC species	20	x 3 = 60
FACU species	58	x 4 = 232
UPL species	60	x 5 = 300
Column Totals:	138 (A)	592 (B)

Prevalence Index = B/A = 4.29

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	100					sandy loam	roots throughout
4-6	10YR 4/2	100					sandy	
6-16	10YR 3/3	97	2.5YR 4/6	3	C	M	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:
sandy layers of soil with no redox features or soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Pasqual Sewer Project City/County: San Diego County Sampling Date: 3/6/2024

Applicant/Owner: ______ State: CA Sampling Point: 4

Investigator(s): P. Morrissey, L. Howard Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: 33.2146 Long: -116.9643 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ______	Is the Sampled Area within a Wetland? Yes X No ______
Hydric Soil Present?	Yes X No ______	
Wetland Hydrology Present?	Yes X No ______	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix (red willow)	30	Y	FACW
2. Sycamore (Plantanus racemosa)	15	Y	FAC
3. emergent valley oak	5	N	FACU
4.			
Total Cover:	50		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Juncus acutus	60	Y	FACW
2. Cocklebur (Xanthum strumarium)	10	N	FAC
3. watercress	15	N	OBL
4. CA rose	5	N	FAC
5. nonnative grass	15	N	UPL
6. Carex spissa	10	N	FAC
7. Rumex obtusifolius	2	N	FAC
8. Cyperus eragrostis	2	N	FACW
Total Cover:	119		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	15	x 1 = 15
FACW species	92	x 2 = 184
FAC species	42	x 3 = 126
FACU species	5	x 4 = 20
UPL species	15	x 5 = 75
Column Totals:	169 (A)	420 (B)

Prevalence Index = B/A = 2.49

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ______

Remarks:

SOIL

Sampling Point: ______

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					sandy clay loam	
6-8	10YR 2/2	90	2.5YR 3/6	10	C	M	sandy clay loam	
8-12	10YR 3/3	90	2.5YR 3/6	10	C	M	sandy loam	
12-16							sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) **(Riverine)**
- X Sediment Deposits (B2) **(Riverine)**
- X Drift Deposits (B3) **(Riverine)**
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 8

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Pasqual Sewer Project City/County: Valley Center / San Diego County Sampling Date: 3/6/24

Applicant/Owner: ______ State: CA Sampling Point: 5

Investigator(s): E. Olmos, L. Gorman Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR): ______ Lat: 33.269612 Long: -116.976459 Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No X	Is the Sampled Area within a Wetland?	Yes ______ No X
Hydric Soil Present?	Yes ______	No X		
Wetland Hydrology Present?	Yes ______	No X		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. willow (red willow)	20	Y	FACW
2.			
3.			
4.			
Total Cover:	20		
Sapling/Shrub Stratum			
1. mulefat	70	Y	FAC
2. molosma laurina	5	N	UPL
3. buckwheat (Eriogonum fasciculatum)	15	N	UPL
4. black sage	2	N	UPL
5.			
Total Cover:	92		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ______ % Cover of Biotic Crust ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	20	x 2 = 40
FAC species	70	x 3 = 210
FACU species	0	x 4 = 0
UPL species	22	x 5 = 110
Column Totals:	112 (A)	360 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ______ No X

Remarks:

SOIL

Sampling Point: ____________

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5							sand	sand only
5-9	10YR 3/3	100					sandy clay loam	no redox
9-12							sand	sand only
12-~~16~~ 14	10YR 3/3	100					sandy clay loam	black organic layer
14-16							sand	sand only

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5) (**LRR C**)
- __ 1 cm Muck (A9) (**LRR D**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Loamy Mucky Mineral (F1)
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- __ 1 cm Muck (A9) (**LRR C**)
- __ 2 cm Muck (A10) (**LRR B**)
- __ Reduced Vertic (F18)
- __ Red Parent Material (TF2)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1) (**Nonriverine**)
- __ Sediment Deposits (B2) (**Nonriverine**)
- __ Drift Deposits (B3) (**Nonriverine**)
- __ Surface Soil Cracks (B6)
- ~~X~~ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Salt Crust (B11)
- __ Biotic Crust (B12)
- __ Aquatic Invertebrates (B13)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Plowed Soils (C6)
- __ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- __ Water Marks (B1) (**Riverine**)
- __ Sediment Deposits (B2) (**Riverine**)
- __ Drift Deposits (B3) (**Riverine**)
- __ Drainage Patterns (B10)
- __ Dry-Season Water Table (C2)
- __ Thin Muck Surface (C7)
- __ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____________

Water Table Present? Yes ____ No X Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____________

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX H – FOCUSED COASTAL CALIFORNIA GNATCATCHER SURVEY REPORT

CHAMBERS GROUP

August 7, 2025
21465

Jess Sattler
Recovery Permit Coordination
United States Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

SUBJECT: 45-DAY COASTAL CALIFORNIA GNATCATCHER FOCUSED SURVEY REPORT FOR THE SAN PASQUAL COMMUNITY SEWER PROJECT, SAN DIEGO COUNTY, CALIFORNIA

Dear Jess Sattler:

Chambers Group, Inc. (Chambers Group) was contracted by Kimley-Horn to conduct focused surveys for coastal California gnatcatcher (*Polioptila californica californica*, CAGN) during the breeding season of 2025 for the San Pasqual Community Sewer Project, Indian Health Service (IHS) Project No. CA 17-E61 (Project) located in San Diego County, California.

Based on a query of the California Natural Diversity Database (CNDDB) managed by the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife (USFWS) Sensitive Species Occurrence Database, there are five historical occurrences of CAGN documented within 5 miles of the Survey Area: two occurrences were approximately 1.2 to 1.4 miles northeast of the Project in 2000, and three occurrences were approximately 3.9 to 4.5 miles southwest of the Project in 2001 and 2006. In addition, suitable habitat for CAGN is present at the Project site. Therefore, CAGN focused surveys were recommended (Chambers Group 2025). The primary purpose of the focused survey effort was to determine presence or absence of CAGN and to record any CAGN nesting activity within the proposed Project impact area (Action Area), plus contiguous suitable habitat within a 500-foot buffer (Survey Area). This report documents the results of focused CAGN surveys conducted by Chambers Group in 2025.

Project Location

The Project site is located on the San Pasqual Band of Mission Indians (SPBMI) Reservation in San Diego County, California (Attachment 1). The survey area is located within the United States Geological Survey (USGS) Rodriguez Mountain 7.5-Minute Quadrangles and includes all suitable habitat within a 500-foot buffer of the Project site (Attachment 2). The survey area does not fall within the Natural Community Conservation Planning (NCCP) area.

CAGN Natural History

The CAGN is a federally listed threatened subspecies of California gnatcatcher (*Polioptila californica*) and a California Species of Special Concern. The range of this species extends from southern California west of the Peninsular and Transverse ranges south into northwestern Baja California, Mexico. The CAGN has a short and slender bill, a tail that is mostly black with white edges, grayish plumage overall, a back and wings that are gray with brown tinge, and a white eye ring. Breeding males have a black cap. It is a permanent resident of Diegan, Riversidian, and Venturan sage scrub sub-associations found from sea level to 2,500 feet (765 meters) in elevation. This species lives and breeds within California sagebrush (*Artemisia californica*) dominated habitats and also occurs in mixed scrub habitats with lesser percentages of this favored shrub (Atwood and Bontrager 2001). The largest threat to the species is a loss of habitat. Other threats include wildfires and nest parasitism.

Methods

The CAGN Survey Area was previously mapped in 2025 by Chambers Group biologists. The CAGN Survey Area was updated and verified during the first 2025 focused CAGN survey by United States Fish and Wildlife Service (USFWS)-permitted biologist Laurie Gorman (ESPER 0012535-1).

Focused surveys were conducted in 2025 within habitat that was determined to be suitable for CAGN by the surveying biologist. A total of six breeding season CAGN surveys were conducted by USFWS-permitted biologist Laurie Gorman (ESPER 0012535-1), with assistance provided by Chambers Group biologists Matthew Speegle and Linnea Howard. Survey methodology followed current protocol (USFWS 1997), and the conditions of Ms. Gorman's 10(a)(1)(A) species recovery permit. Each survey was conducted during favorable weather conditions to maximize detection probability.

All surveys were conducted on foot by looking and listening for the target species in suitable habitat within the Survey Area. No more than 32 hectares (80 acres) of suitable habitat was surveyed during any single survey day.

Observations of the songs, scolds, whisper calls, flight patterns, behaviors, and plumage characteristics were used in conjunction to ascertain presence/absence of CAGN. The biologists conducted the surveys from optimal stationary locations to see and hear the target species without harming any other wildlife species in the area.

The permitted biologist used prerecorded CAGN vocalizations to elicit CAGN within and/or adjacent to all suitable habitat. After a brief and silent acclimation period of one to two minutes, the biologist broadcasted the prerecorded CAGN vocalizations at intervals, mimicking natural vocalization conditions, while they walked meandering transects through the Survey Area (i.e., broadcast at natural volume occurring for approximately 15 seconds followed by 1 to 2 minutes of silence). The distance between broadcast locations varied from 60 to 100 feet (20 to 30 meters), depending on topography, vegetation, and other factors. If a CAGN was detected, the taped vocalization broadcast was ceased at that location; and the location, numbers, status, and demographic data of the target species were recorded.

The locations of any detected CAGN and other sensitive species incidentally detected were recorded using hand-held Global Positioning System (GPS) units. In addition, numbers and locations of any brown-headed cowbirds (*Molothrus ater*, BHCO) observed were recorded.

Chambers Group compiled all wildlife species observed or detected during each survey day into a single comprehensive species list for the combined survey effort.

Results

Six focused CAGN surveys were conducted from May 14 through June 27, 2025. Each survey consisted of one day. A summary of the survey effort, including dates, times, weather conditions, personnel, and CAGN detected, is presented in Table 1.

A total of approximately 16.07 acres of suitable CAGN habitat was surveyed. Suitable CAGN habitat within the Survey Area consists primarily of California Sagebrush Scrub and California Buckwheat Scrub, based on *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) and as described in the *Biological Survey Report for the San Pasqual Community Sewer Project* (Chambers Group 2025). Suitable habitat occurs in patches that are separated by large areas of chaparral, riparian areas, oak woodlands, and low-density residential development. Connectivity between patches of suitable habitat within the Survey Area as well as to areas where CAGN were previously documented is limited.

Habitat quality ranges from low to high with varying levels of disturbance, patch size, and amount of California sagebrush present. The highest quality habitat within the Survey Area is located along Oos Road in the northeastern portion of the Survey Area; this area consists of large, undisturbed patches of California Sagebrush Scrub with a high amount of California sagebrush intermixed.

No CAGN were detected within the Survey Area during any of the six surveys. One male BHCO was heard calling and seen flying over the Survey Area during the fourth survey on June 4, 2025, at GPS location 33.2153053, -116.9770521. Wildlife species incidentally detected during the survey is provided in Attachment 3. Representative photos of the vegetation communities within the CAGN Survey Area are shown in Attachment 4. A biologist signature page certifying the results presented in this report is provided in Attachment 5.

Table 1: Summary of Survey Conditions and Results

Survey Number	Date	Time	Weather	Personnel	CAGN Observations
1	5/14/2025	07:00 – 11:00	Start: 53°F, wind 0-2 mph, 5% cloud cover End: 66°F, wind 1-5 mph, 0% cloud cover	Laurie Gorman, Linnea Howard*	None
2	5/21/2025	07:00 – 10:20	Start: 66°F, wind 0-1 mph, 0% cloud cover End: 85°F, wind 1-4mph, 0% cloud cover	Laurie Gorman, Linnea Howard*	None
3	5/28/2025	07:00 – 10:12	Start: 60°F, wind 0-1 mph, 0% cloud cover End: 72°F, wind 0-2 mph, 0% cloud cover	Laurie Gorman, Matthew Speegle*	None
4	6/4/2025	06:50 – 09:45	Start: 57°F, wind 0-1 mph, 100% cloud cover End: 70°F, wind 0-1 mph, 100% cloud cover	Laurie Gorman	None
5	6/19/2025	06:30 – 09:30	Start: 57°F, wind 0-1 mph, 100% cloud cover End: 70°F, wind 1-3 mph, 30% cloud cover	Laurie Gorman	None
6	6/27/2025	06:30 – 09:30	Start: 58°F, wind 0-1 mph, 0% cloud cover End: 63°F, wind 0-1 mph, 0% cloud cover	Laurie Gorman	None

°F = degrees Fahrenheit; mph = miles per hour; * = Supervised Individual/Not CAGN Permitted

Discussion

No CAGN were detected during the 2025 focused surveys. Based on the results of the surveys, CAGN are considered absent from the Project site.

Please call me at (949) 933-9432 or email me at lgorman@chambersgroupinc.com if you have any questions or comments regarding this letter report.

Sincerely,

CHAMBERS GROUP, INC.

Laurie Gorman

Laurie Gorman
Senior Project Manager / Biologist

Attachments

Attachment 1 – Project Location and Vicinity Map
Attachment 2 – CAGN Survey Area on a USGS Topographic Map
Attachment 3 – Wildlife Species Detected
Attachment 4 – Site Photographs
Attachment 5 – CAGN Survey Project Biologist Signature Page

References

Atwood, J L. and D R. Bontrager

2001 California Gnatcatcher (*Polioptila californica*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/574.

Chambers Group, Inc. (Chambers Group)

2025 *Biological Survey Report for the San Pasqual Community Sewer Project.* August 2025.

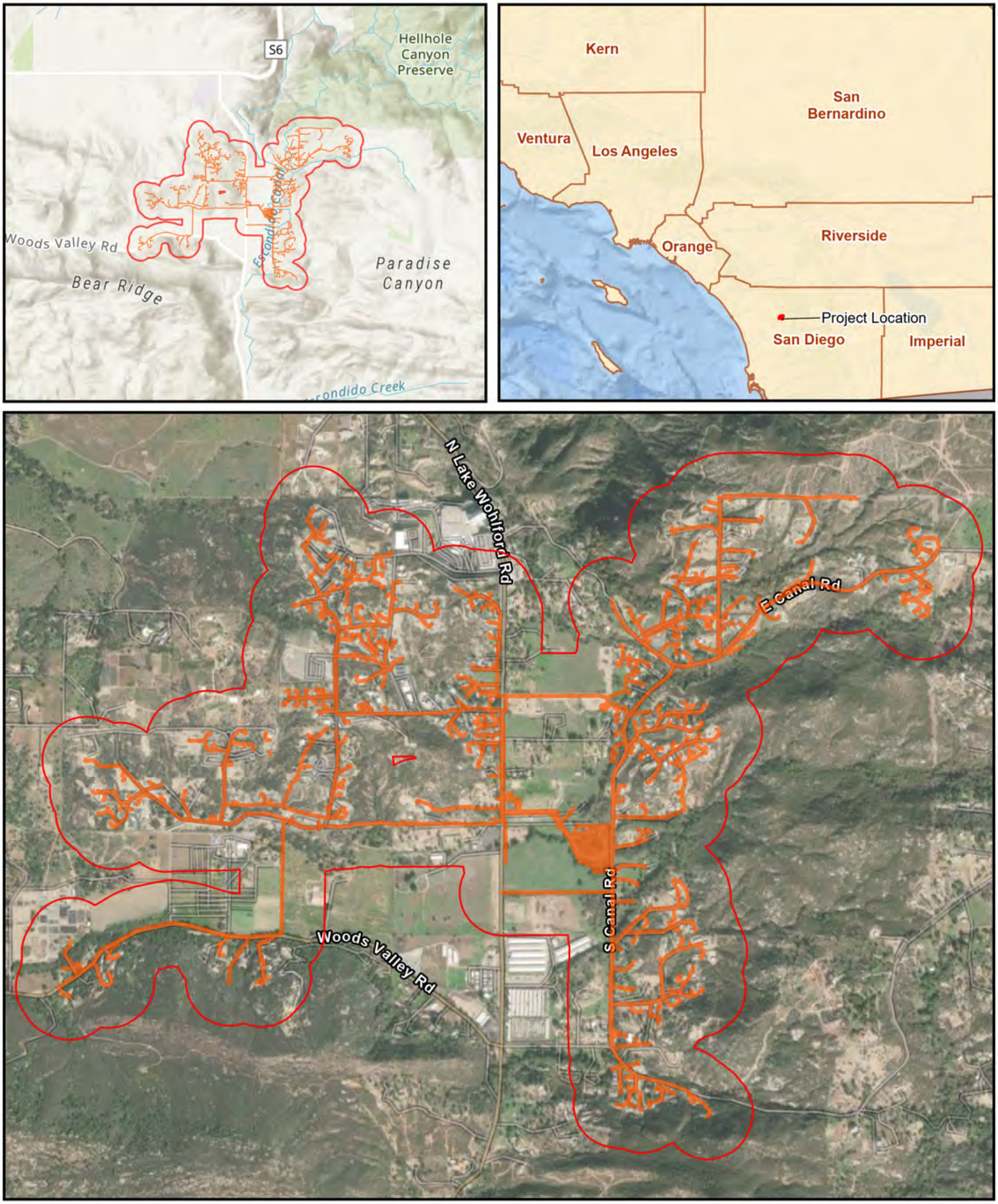
Sawyer, J.O., Jr., T. Keeler-Wolf, J. Evens

2009 *A Manual of* California *Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS)

1997 *California Gnatcatcher Survey Guidelines*. Carlsbad Fish and Wildlife Office.

ATTACHMENT 1 – PROJECT LOCATION AND VICINITY MAP



Survey Area

Project Site

N

0 700 1,400 2,800

Feet

Figure 1

San Pasqual Community Sewer
Project Location and Vicinity

Name: 21465 San Pasqual Community Sewer Bio.Mxd
Print Date: 8/6/2025 12:53 PM Author: pcarlos

CHAMBERS GROUP

ATTACHMENT 2 – CAGN SURVEY AREA ON USGS QUADRANGLE MAP

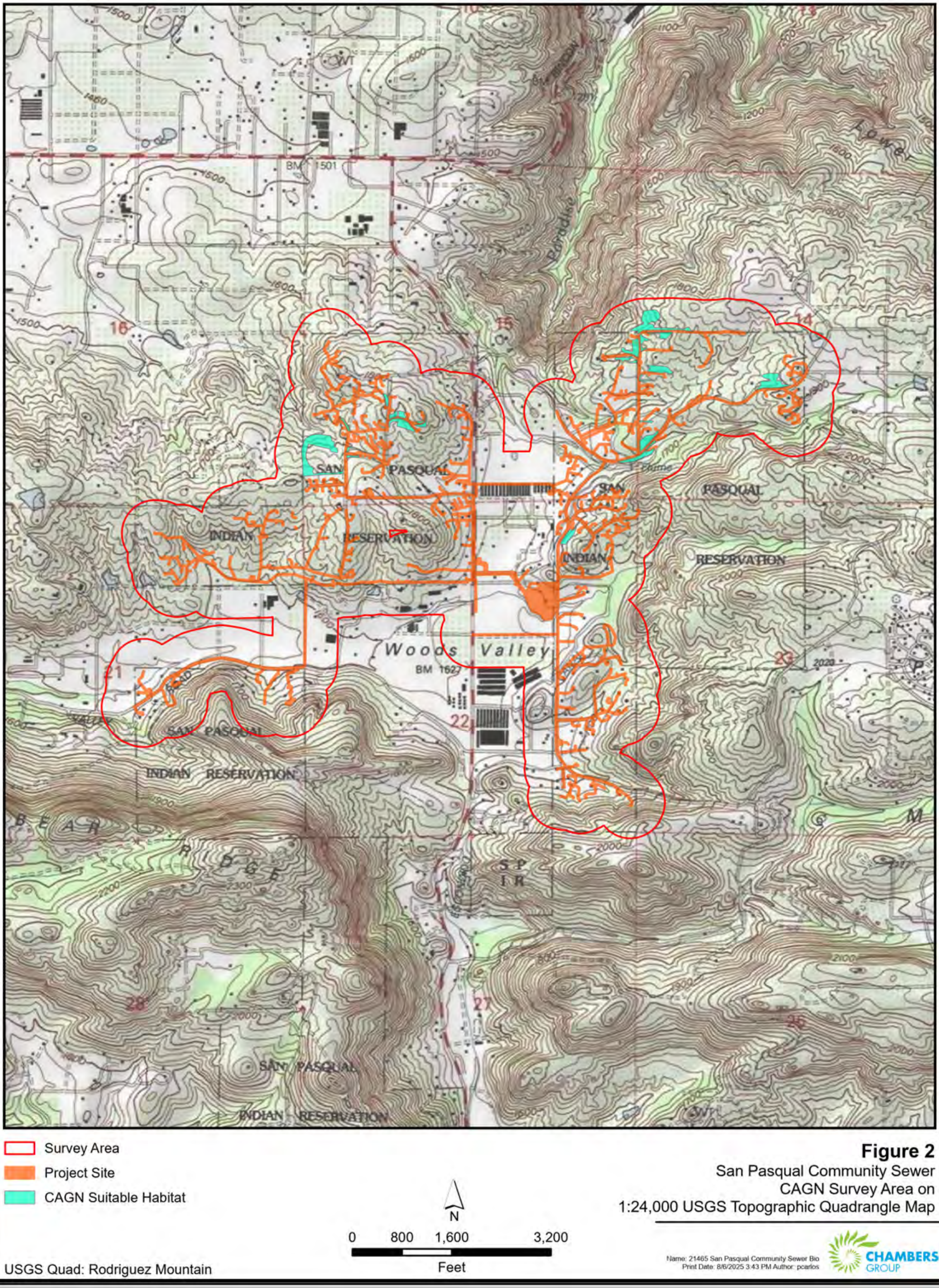


Figure 2
San Pasqual Community Sewer
CAGN Survey Area on
1:24,000 USGS Topographic Quadrangle Map

Name: 21465 San Pasqual Community Sewer Bio
Print Date: 8/6/2025 3:43 PM Author: pcarlos

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
CLASS REPTILIA	**REPTILES**
PHRYNOSOMATIDAE	**ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS**
Phrynosoma blainvillii	coast horned lizard
Uta stansburiana	side-blotched lizard
CLASS AVES	**BIRDS**
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
COLUMBIDAE	**PIGEONS & DOVES**
Streptopelia decaocto	Eurasian Collared-Dove
Zenaida macroura	mourning dove
CUCULIDAE	**CUCKOOS & ROADRUNNERS**
Geococcyx californianus	greater roadrunner
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
PICIDAE	**WOODPECKERS**
Colaptes auratus	northern flicker
Dryobates nuttallii	Nuttall's woodpecker
Melanerpes formicivorus	acorn woodpecker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Tyrannus vociferans	Cassin's kingbird
HIRUNDINIDAE	**SWALLOWS**
Petrochelidon pyrrhonota	cliff swallow
CORVIDAE	**JAYS & CROWS**
Aphelocoma californica	California scrub-jay
Corvus corax	common raven
PARIDAE	**CHICKADEES, TITMICE**
Baeolophus inornatus	oak titmouse
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
TROGLODYTIDAE	**WRENS**
Thryomanes bewickii	Bewick's wren

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
SYLVIIDAE	**OLD WORLD WARBLERS**
Chamaea fasciata	wrentit
TURDIDAE	**THRUSHES**
Sialia mexicana	western bluebird
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
PTILOGONATIDAE	**SILKY-FLYCATCHERS**
Phainopepla nitens	phainopepla
STURNIDAE	**STARLINGS**
Sturnus vulgaris	European starling
PARULIDAE	**WOOD WARBLERS**
Leiothlypis celata	orange-crowned warbler
ICTERIDAE	**BLACKBIRDS**
Icterus cucullatus	hooded oriole
Molothrus ater	brown-headed cowbird
PASSERELLIDAE	**NEW WORLD SPARROWS**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
Spizella atrogularis	black-chinned sparrow
CARDINALIDAE	**CARDINALS**
Pheucticus melanocephalus	black-headed grosbeak
FRINGILLIDAE	**FINCHES**
Haemorhous mexicanus	house finch
Spinus psaltria	lesser goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
PHASIANIDAE	**JUNGLEFOWL**
Gallus domesticus	domestic chicken
CLASS MAMMALIA	**MAMMALS**
LEPORIDAE	**HARES & RABBITS**
Sylvilagus audubonii	desert cottontail
SCIURIDAE	**SQUIRRELS**
Spermophilus beecheyi	California ground squirrel
CANIDAE	**WOLVES & FOXES**
Canis familiaris	domestic dog
FELIDAE	**CATS**
Felis catus	domestic cat

ATTACHMENT 4 – SITE PHOTOGRAPHS

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 1

Representative photo of California Sagebrush Scrub habitat within the coastal California gnatcatcher (*Polioptila californica californica*; CAGN) Survey Area, adjacent to Oos Road. This high-quality habitat is dominated by California sagebrush (*Artemisia californica*). Photo taken facing northeast on March 6, 2024.

Photo 2

View of California Buckwheat Scrub habitat within the Survey Area between East Canal Road and a drainage containing riparian habitat. This habitat is dominated by California buckwheat (*Eriogonum fasciculatum*) with California sagebrush intermixed. This habitat is of low to moderate quality for CAGN. Photo taken facing south on February 27, 2024.

ATTACHMENT 4 - SITE PHOTOGRAPHS

	**Photo 3** View of California Buckwheat Scrub habitat within the Survey Area, along Hawk Hill Ln. This habitat has a low amount of California sagebrush present and provides low-quality habitat for CAGN. Photo taken facing southwest on June 19, 2025.
	**Photo 4** View of California Sagebrush Scrub habitat within the Survey Area, off the western edge of a dirt lot. The lot is located on the west side of Kunyaaw Path. This patch of habitat is of high quality to support CAGN; however, it is not contiguous with other areas of high-quality habitat. Photo taken facing west on May 21, 2025.

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 5

Patch of California Buckwheat Scrub habitat within the Survey Area on the west of South San Pasqual Road. This habitat consists mostly of California buckwheat and is of low quality to support CAGN. Photo taken facing northwest on May 14, 2025.

Photo 6

California Sagebrush Scrub habitat within the Survey Area, dominated by California buckwheat with a small amount of California sagebrush intermixed. This low-quality habitat is located east of Kunyaaw Path. Photo taken facing southeast on May 14, 2025.

ATTACHMENT 5 – CAGN SURVEY PROJECT BIOLOGIST SIGNATURE PAGE

ATTACHMENT 5: CAGN FOCUSED SURVEY PROJECT BIOLOGIST SIGNATURE PAGE

The biologist performing focused, protocol-level surveys for coastal California gnatcatcher (*Polioptila californica californica*) during the breeding season for the San Pasqual Community Sewer Project located on the San Pasqual Band of Mission Indians (SPBMI) Reservation in San Diego County, California was permitted to survey for this species under Section 10(a)(1)(A) of the Endangered Species Act (ESA).

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

Laurie Gorman

____

Laurie Gorman
Chambers Group, Inc.
USFWS Permit Number ESPER 0012535-1

APPENDIX I – FOCUSED LEAST BELL'S VIREO SURVEY REPORT

CHAMBERS GROUP

August 7, 2025
21465

Jess Sattler
Recovery Permit Coordination
United States Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

SUBJECT: 45-DAY LEAST BELL'S VIREO FOCUSED SURVEY REPORT FOR THE SAN PASQUAL COMMUNITY SEWER PROJECT, SAN DIEGO COUNTY, CALIFORNIA

Dear Jess Sattler:

Chambers Group, Inc. (Chambers Group) was contracted by Kimley-Horn to conduct focused surveys for least Bell's vireo (*Vireo bellii pusillus,* LBVI) during the breeding season of 2025 for the proposed San Pasqual Community Sewer Project, Indian Health Service (IHS) Project No. CA 17-E61 (Project) located in San Diego County, California.

Based on a query of the California Natural Diversity Database (CNDDB) managed by the California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife (USFWS) Sensitive Species Occurrence Database, there are 16 historical occurrences of LBVI documented within 5 miles of the Survey Area, primarily at Lake Wohlford Park to the south and along the Moosa Canyon Stream system to the west. The closest historical occurrence was 1.7 miles southwest of the Survey Area in 2009. In addition, suitable habitat for LBVI is present at the Project site. Therefore, LBVI focused surveys were recommended (Chambers Group 2025). The primary purpose of the focused survey effort was to determine presence or absence of LBVI and to record any LBVI nesting activity within the proposed Project impact area (Action Area), plus contiguous suitable habitat within a 500-foot buffer (Survey Area). This report documents the results of focused LBVI surveys conducted by Chambers Group in 2025.

Project Location

The Project site is located on the San Pasqual Band of Mission Indians (SPBMI) Reservation in San Diego County, California (Attachment 1). The Survey Area is located within the United States Geological Survey (USGS) Rodriguez Mountain 7.5-Minute Quadrangles and includes all suitable habitat within a 500-foot buffer of the Project site (Attachment 2).

LBVI Natural History

The LBVI was state-listed as an endangered subspecies of Bell's vireo by the California Department of Fish and Wildlife (CDFW) in 1980 and federally listed as endangered by the USFWS in 1986 (USFWS 1986). Critical habitat for the LBVI was designated in 1994 (USFWS 1994). The LBVI subspecies is restricted to coastal and inland southern California and Baja California, Mexico. Its winter range extends along the Pacific coast from northern Mexico south to northern Nicaragua. In San Diego County, LBVI nesting season typically extends from late April through early July, with egg-laying typically peaking in late April (Unitt 2004).

This species inhabits riparian areas such as willow (*Salix* sp.) woodlands, dense mule fat (*Baccharis salicifolia*), and patches of scrub oak (*Quercus dumosa*) and mesquite (*Prosopis* sp.) with dense early successional understories. Preferred nesting habitat is low, dense, scrubby vegetation in early successional areas that are particularly dependent on riparian areas.

The LBVI is a small, gray songbird with pale yellow wash on its sides, two faint wing bars, and a faint eye ring. The LBVI builds a suspended cup nest about 0.5 to 2.0 meters above the ground and, on average, lays four eggs. It may produce two broods per season. On the breeding grounds, the LBVI feeds primarily on insects and small spiders (Brown 1993). The two major factors in the decline of LBVI populations are nest parasitism by the brown-headed cowbird (*Molothrus ater*; BHCO) and loss and degradation of habitat (USFWS 1998).

Methods

Suitable habitat for LBVI within the LBVI Survey Area was previously mapped in 2025 by Chambers Group biologists. The previous mapping effort was updated and verified during the first 2025 focused LBVI survey by the surveying biologists.

Focused surveys were conducted in 2025 within habitat that was determined to be suitable for LBVI by the surveying biologists. A total of eight breeding season LBVI surveys, spaced at least 10 days apart, were conducted by Chambers Group biologists Laurie Gorman, Matt Speegle, and Linnea Howard. Survey methodology followed the current protocol, *Least Bell's Vireo Survey Guidelines* (USFWS 2001). Each survey was conducted during favorable weather conditions to maximize detection probability.

Survey periods generally occurred between dawn and 1100 hours. Extreme weather conditions, such as excessive or abnormal temperatures, wind, and precipitation, were avoided. Surveyors did not survey more than 50 hectares of habitat on any given survey day. All surveys were conducted on foot by looking for and listening for the target species in suitable habitat within the Survey Area. Surveyors walked along the edge of suitable habitat and chose vantage points that would maximize the likelihood of detecting LBVI audibly and visually. Precautions were taken to avoid disturbance of habitat and any birds or other wildlife present.

The locations of any detected LBVI and other special status species incidentally detected were recorded using hand-held Global Positioning System (GPS) units. Information on any LBVI individuals observed was recorded to document the numbers and locations of paired or unpaired territorial males, ages and sexes of all birds observed, and nesting behavior. In addition, numbers and locations of any BHCO observed were recorded.

Chambers Group biologists compiled all wildlife species observed or detected during each survey day into a single comprehensive species list for the combined survey effort.

Results

Eight focused LBVI surveys were conducted from May 6 through July 18, 2025. Each survey consisted of one day. A summary of the survey effort, including dates, times, weather conditions, personnel, and LBVI detected, is presented in Table 1.

A total of approximately 31.53 acres of suitable LBVI habitat was surveyed. Suitable LBVI habitat within the Survey Area consists of the following vegetation communities, based on *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) and as described in the *Biological Survey Report for the San Pasqual Community Sewer Project* (Chambers Group 2025): Mulefat thicket, California Sycamore-Coast Live Oak Riparian Woodland, Red Willow Riparian Woodland, and Cattail Marshes. Habitat quality ranges from low to high, with the highest quality habitat located along drainages north of Woods Valley Road, on either side of Oos Road, and south of East Canal Road. Lower quality habitat is present in isolated patches next to roadside drainages and culverts. Connectivity between suitable habitat within the Survey Area and areas where LBVI were previously documented is fragmented.

No LBVI were detected within the Survey Area during any of the eight surveys. One male BHCO was heard calling and seen flying within the Survey Area during the second survey on May 16, 2025, at GPS location 33.205908, -116.986465. One male BHCO was observed at the same location during the third survey on May 27, 2025. Wildlife species incidentally detected during the surveys are provided in Attachment 3. Site photographs depicting suitable LBVI habitat throughout the Survey Area are provided in Attachment 4.

Table 1: Summary of Survey Conditions and Results

Survey Number	Date	Time	Weather	Personnel	LBVI Observations
1	5/6/2025	07:00 – 11:00	Start: 56°F, wind 0- mph, 100% cloud cover End: 58°F, wind 2-6 mph, 100% cloud cover	Laurie Gorman, Matt Speegle	None
2	5/16/2025	07:15 – 11:30	Start: 58°F, wind 0-1 mph, 100% cloud cover End: 63°F, wind 1-4mph, 30% cloud cover	Matt Speegle	None
3	5/27/2025	07:00 – 11:00	Start: 60°F, wind 0-1 mph, 100% cloud cover End: 71°F, wind 2-4 mph, 15% cloud cover	Matt Speegle	None
4	6/6/2025	07:00 – 10:30	Start: 62°F, wind 1-4 mph, 100% cloud cover End: 68°F, wind 0-3 mph, 100% cloud cover	Linnea Howard	None
5	6/16/2025	07:00 – 09:30	Start: 69°F, wind 0-1 mph, 0% cloud cover End: 80°F, wind 1-3 mph, 0% cloud cover	Laurie Gorman	None
6	6/26/2025	06:30 – 10:15	Start: 55°F, wind 0-3 mph, 100% cloud cover End: 75°F, wind 1-4 mph, 0% cloud cover	Linnea Howard	None
7	7/8/2025	06:30 – 11:00	Start: 63°F, wind 0-2 mph, 0% cloud cover End: 82°F, wind 1-4 mph, 0% cloud cover	Linnea Howard, Matt Speegle	None
8	7/18/2025	06:30 – 09:15	Start: 56°F, wind 0-1 mph, 0% cloud cover End: 66°F, wind 0-2 mph, 0% cloud cover	Laurie Gorman	None

°F = degrees Fahrenheit; mph = miles per hour

Discussion

No LBVI were detected during the 2025 focused surveys. Based on the results of the surveys, LBVI are considered absent from the Project site.

Please call me at (949) 933-9432 or email me at lgorman@chambersgroupinc.com if you have any questions or comments regarding this letter report.

Sincerely,

CHAMBERS GROUP, INC.

Laurie Gorman

Laurie Gorman
Senior Project Manager / Biologist

Attachments

Attachment 1 – Project Location and Vicinity Map
Attachment 2 – LBVI Suitable Habitat Map
Attachment 3 – Wildlife Species Detected
Attachment 4 – Site Photographs

References

Brown, B. T.

1993 *Bell's Vireo* (Vireo bellii). In The Birds of North America, No. 35 (A. Poole, P. Stettenheim, and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

Chambers Group, Inc. (Chambers Group)

2025 *Biological Survey Report for the San Pasqual Community Sewer Project.* August 2025.

Sawyer, J.O., Jr., T. Keeler-Wolf, J. Evens

2009 *A Manual of* California *Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA.

Unitt, P.

2004 *San Diego County Bird Atlas*. San Diego Natural History Museum. San Diego, CA.

U.S. Fish and Wildlife Service (USFWS)

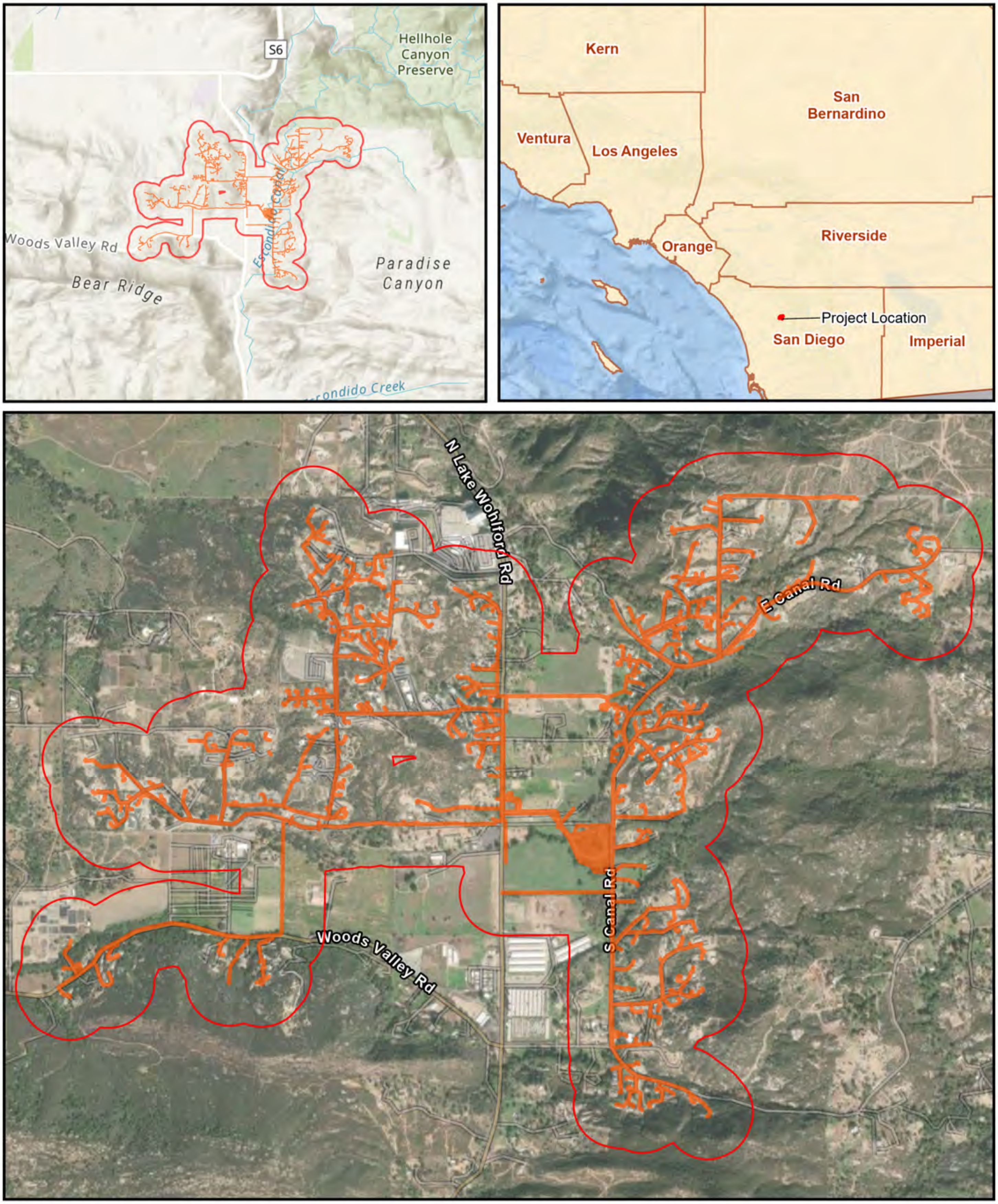
1986 *Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the Least Bell's Vireo*. Federal Register Vol. 51, No. 85. May 2.

1994 *Endangered and Threatened Wildlife and Plants: Designation of Critical habitat for the Least Bell's Vireo Final Rule*. Federal Register Vol. 59, No. 22. February 2.

1998 *Draft Recovery Plan for the Least Bell's Vireo*. U.S. Fish and Wildlife Service, Portland, OR. 139pp.

2001 *Least Bell's Vireo Survey Guidelines*. Carlsbad Fish and Wildlife.

ATTACHMENT 1 – PROJECT LOCATION AND VICINITY MAP



Survey Area
Project Site

N

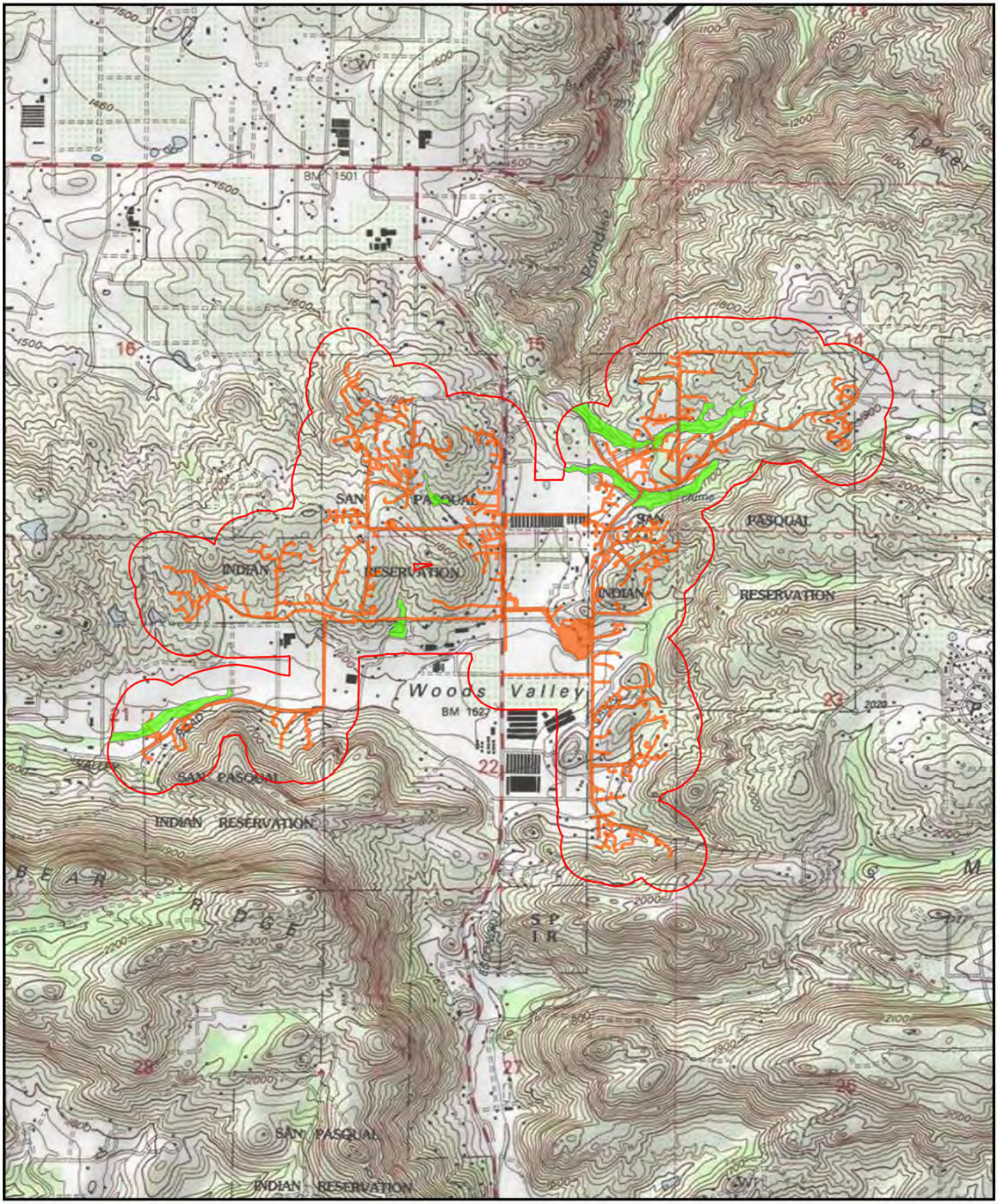
0 700 1,400 2,800
Feet

Figure 1
San Pasqual Community Sewer
Project Location and Vicinity

Name: 21465 San Pasqual Community Sewer Bio.Mxd
Print Date: 8/6/2025 12:53 PM Author: pcarlos

CHAMBERS GROUP

ATTACHMENT 2 – LBVI SUITABLE HABITAT MAP



Survey Area

Project Site

LBVI Suitable Habitat

N

0 800 1,600 3,200

Feet

USGS Quad: Rodriguez Mountain

Figure 2

San Pasqual Community Sewer

LBVI Survey Area on

1:24,000 USGS Topographic Quadrangle Map

Name: 21465 San Pasqual Community Sewer Bio
Print Date: 8/6/2025 3:43 PM Author: pcarlos

CHAMBERS GROUP

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
CLASS REPTILIA	**REPTILES**
PHRYNOSOMATIDAE	**ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS**
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
CLASS AVES	**BIRDS**
CATHARTIDAE	**NEW WORLD VULTURES**
Cathartes aura	turkey vulture
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**
Buteo jamaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
ODONTOPHORIDAE	**NEW WORLD QUAIL**
Callipepla californica	California quail
COLUMBIDAE	**PIGEONS & DOVES**
Streptopelia decaocto	Eurasian Collared-Dove
Zenaida macroura	mourning dove
CUCULIDAE	**CUCKOOS & ROADRUNNERS**
Geococcyx californianus	greater roadrunner
STRIGIDAE	**TRUE OWLS**
Bubo virginianus	great horned owl
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
PICIDAE	**WOODPECKERS**
Colaptes auratus	northern flicker
Dryobates nuttallii	Nuttall's woodpecker
Melanerpes formicivorus	acorn woodpecker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Myiarchus cinerascens	ash-throated flycatcher
Sayornis nigricans	black phoebe
Tyrannus vociferans	Cassin's kingbird
HIRUNDINIDAE	**SWALLOWS**
Petrochelidon pyrrhonota	cliff swallow
CORVIDAE	**JAYS & CROWS**
Aphelocoma californica	California scrub-jay
Corvus corax	common raven
PARIDAE	**CHICKADEES, TITMICE**
Baeolophus inornatus	oak titmouse

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
AEGITHALIDAE	**BUSHTITS**
Psaltriparus minimus	bushtit
SITTIDAE	**NUTHATCHES**
Sitta carolinensis	white-breasted nuthatch
TROGLODYTIDAE	**WRENS**
Thryomanes bewickii	Bewick's wren
Troglodytes aedon	house wren
SYLVIIDAE	**OLD WORLD WARBLERS**
Chamaea fasciata	wrentit
TURDIDAE	**THRUSHES**
Sialia mexicana	western bluebird
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Mimus polyglottos	northern mockingbird
Toxostoma redivivum	California thrasher
PTILOGONATIDAE	**SILKY-FLYCATCHERS**
Phainopepla nitens	phainopepla
STURNIDAE	**STARLINGS**
Sturnus vulgaris	European starling
PARULIDAE	**WOOD WARBLERS**
Geothlypis trichas	common yellowthroat
Leiothlypis celata	orange-crowned warbler
ICTERIDAE	**BLACKBIRDS**
Icterus cucullatus	hooded oriole
Molothrus ater	brown-headed cowbird
PASSERELLIDAE	**NEW WORLD SPARROWS**
Melospiza melodia	song sparrow
Melozone crissalis	California towhee
Pipilo maculatus	spotted towhee
CARDINALIDAE	**CARDINALS**
Pheucticus melanocephalus	black-headed grosbeak
FRINGILLIDAE	**FINCHES**
Haemorhous mexicanus	house finch
Spinus psaltria	lesser goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
CLASS MAMMALIA	**MAMMALS**
LEPORIDAE	**HARES & RABBITS**
Sylvilagus audubonii	desert cottontail

ATTACHMENT 3 – WILDLIFE SPECIES DETECTED

Scientific Name	Common Name
SCIURIDAE	**SQUIRRELS**
Spermophilus beecheyi	California ground squirrel
CANIDAE	**WOLVES & FOXES**
Canis familiaris	domestic dog
Canis latrans	coyote
FELIDAE	**CATS**
Felis catus	domestic cat

ATTACHMENT 4 – SITE PHOTOGRAPHS

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 1

Representative photo of Red Willow Riparian Woodland habitat within the (*Vireo bellii pusillus;* LBVI) Survey Area, taken from Woods Valley Road. This habitat is dominated by red willow (*Salix laevigata*). Photo taken facing northwest on February 27, 2024.

Photo 2

Close-up view of habitat structure within Red Willow Riparian Woodland habitat that runs along a drainage north of Woods Valley Road. The dense, well-developed understory and varying canopy height provide high quality habitat for LBVI along this portion of the Survey Area. Photo taken facing west on July 24, 2025.

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 3

Overview of a patch of Red Willow Riparian Woodland habitat within the Survey Area, on the north side of Augustine Orosco Lane. This habitat is present within a drainage that continues south through a culvert under the road. Another patch of habitat is present on the south side of Augustine Orosco Lane (see Photos 5 and 6). These isolated patches of habitat have a low potential to support LBVI. Photo taken facing northeast on February 27, 2024.

Photo 4

Close-up view of the patch of Red Willow Riparian Woodland habitat shown in Photo 3, on the north side of Augustine Orosco Lane. Photo taken facing northeast on June 16, 2025.

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 5

Overview of a patch of Red Willow Riparian Woodland habitat on the south side of Augustine Orosco Lane. Photo taken facing east on February 27, 2024.

Photo 6

Close-up view of the patch of Red Willow Riparian Woodland habitat shown in Photo 5, on the south side of Augustine Orosco Lane. Photo taken facing south on May 6, 2025.

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 7

Overview of Mulefat Thicket habitat transitioning into California Sycamore – Coast Live Oak Riparian Woodland habitat, taken from South San Pasqual Road. This area is dominated by mulefat (*Baccharis salicifolia*), California sycamore (*Platanus racemosa*), and coast live oak (*Quercus agrifolia*). Photo taken facing southeast on February 27, 2024.

Photo 8

View of California Sycamore – Coast Live Oak Riparian Woodland habitat within the Survey Area that follows a drainage along the south of East Canal Road. This area provides moderate quality habitat to support LBVI. Photo taken facing south on March 6, 2024.

ATTACHMENT 4 - SITE PHOTOGRAPHS

	**Photo 9** View of California Sycamore – Coast Live Oak Riparian Woodland habitat and Cattail Marshes within the Survey Area, taken from within the drainage east of South Canal Road and south of East Canal Road. This area provides high quality habitat to support LBVI. Photo taken facing east on March 6, 2024.
	**Photo 10** California Sycamore – Coast Live Oak Riparian Woodland habitat within the Survey Area, south of the intersection of East Canal Road and Oos Road. Photo taken facing southwest on March 6, 2024.

ATTACHMENT 4 - SITE PHOTOGRAPHS

Photo 11

View of California Sycamore – Coast Live Oak Riparian Woodland habitat suitable for LBVI along a drainage which stretches east to west under Oos Rd, north of East Canal Road. Photo facing west on February 27, 2024.

Photo 12

Representative photo of the canopy structure within California Sycamore – Coast Live Oak Riparian Woodland habitat on either side of Oos Rd, north of East Canal Road. The dense, well-developed understory and varying canopy height provide high quality habitat for LBVI. Photo facing east on May 6, 2025.

APPENDIX J – IHS/USFWS INFORMAL CONSULTATION CORRESPONDENCE

DEPARTMENT OF HEALTH & HUMAN SERVICES PUBLIC HEALTH SERVICE

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

November 26, 2024

Mr. Jonathan Snyder
Assistant Field Supervisor
U.S. Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Dear Mr. Snyder:

The Indian Health Service (IHS) is proposing to provide Federal assistance under the Sanitation Facilities Construction (SFC) program to construct the proposed San Pasqual Community Sewer Project. The proposed project will involve 12,840 linear feet (LF) of sewer line; 64,400 LF of gravity sewer line, 8.5 acres for a waste water treatment plant (WWTP) and 5,500 LF of recycled water pipes. install approximately 2,400 linear feet of new six-inch force main to connect an existing water main to new homes. The proposed project is located on the San Pasqual Band of Mission Indians Reservation, near Valley Center, San Diego County (Rodriquez Mountain USGS 7.5' quadrangle). The Action Area encompasses approximately 173 acres. The Survey Area for this Biological Survey Report includes a 100-foot buffer around the Action Area to account for staging areas for a total area of 389 acres.

The IHS is required to comply with Section 7 of the Endangered Species Act (ESA) of 1973, as amended. No federally sensitive species were detected during the survey; however, there is a potential for occurrence for the following species: coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), arroyo toad (*Anaxyrus californicus*), Nevin's barberry (*Berberis nevinii*), San Diego ambrosia (*Ambrosia pumila*), San Diego thorn-mint (*Acanthomintha ilicifolia*), and thread-leaved brodiaea (*Brodiaea filifolia*). IHS has determined that the proposed work is *Not Likely to Adversely Affect (NLAA)* with the implementation of conservation measures. If necessary, protocol surveys will be conducted during the appropriate seasons. There is no critical habitat in the proposed action area. There are a number of birds protected by the Migratory Bird Treaty Act (MBTA) that could be affected between January 14 and September 1 of any given year if vegetation should be removed. A preconstruction nesting survey would be performed if brushing or grading occur during the bird breeding season.

We request informal consultation be initiated and request your concurrence with our finding of effect in accordance with the Endangered Species Act (50 CFR Part 402) and the Migratory Bird Treaty Act (16 U.S.C. 703-712). IHS has enclosed a Biological Resource Survey that includes photographs and a map of the project area to support our finding. If you require any additional information, please contact me at (916) 930-3981x342 or donna.meyer@ihs.gov.

Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
California Area Office

Enclosure

Majkrzak, Julia (IHS/CAL/EDO)

From:	Meyer, Donna (IHS/CAL/AO)
Sent:	Wednesday, October 1, 2025 9:57 AM
To:	'Pappas, Dimitri A'
Cc:	Majkrzak, Julia (IHS/CAL/EDO)
Subject:	San Pasqual Sewer Section 7 Consultation
Attachments:	SPBMI_BiologicalReport_2025.09.26.pdf

Hello Dimitri,

This email is following up on our informal consultation regarding the proposed San Pasqual Sewer project. As you know, we initiated informal consultation in November 2024 with an initial Biological Resource Survey completed for the proposed project. After subsequent conversation, we elected to complete focused species surveys for coastal California gnatcatcher and the least Bell's vireo, and these were delivered by email to you on 8/15/2025 from the consultant. There has been no written response from the USFWS to the focused surveys that were submitted. Around the same time, IHS acknowledged that the biological report should be updated to reflect the current design alignment for the proposed facilities. Therefore, IHS requested the consultant update the report to quantify impacts based on the current project design, as well as to incorporate feedback from our informal conversations. Due to the outcome of the completed focused species surveys and the updates to the Biological Resource Survey report, IHS has modified its determination to "No effect", and this email serves to notify the USFWS of the revised determination.

To support this determination, the revised Biological Resource Survey report is attached to this email. The revised report includes updated tables that provide the acreages of land in the vicinity of the project. Tables 7, 8 and 9 (for Potential Jurisdictional Non-Wetland Drainages, Potential Jurisdictional Wetland, and vegetation and land cover types) were updated for acreage within the temporary and permanent portions of the action area (action area defined as a 50-ft corridor around alignments) and the survey area (which is a 100-ft buffer around the action area). Figures 5 and 6 were also updated, and include an overlay of potential staging areas and temporary and permanent impact areas. Also, a figure 6b was added to show the vegetation at the proposed treatment plant site on one page.

The updated report also considers the potential staging areas. Native vegetation communities were identified within the proposed construction staging areas, and the updated report recommends a biological monitor flag these sensitive areas for avoidance and that the contractor restrict activities to non-sensitive portions of the sites. This recommendation will be implemented as a mitigation measure for the project to avoid impacts, and combined with the outcomes of the focused species surveys, contributes to our reason for changing the determination to "No Effect".

Because IHS does not need a concurrence from the Service for a "No Effect" determination, we also understand that no approval is necessary for the focused surveys on the gnatcatcher and Least Bell's vireo. The focused surveys resulted in an absence of these species and the IHS's proposed action will not result in a "take" of either. We are providing this as informational and to close Section 7 ESA consultation with your office.

Kind regards,

Donna

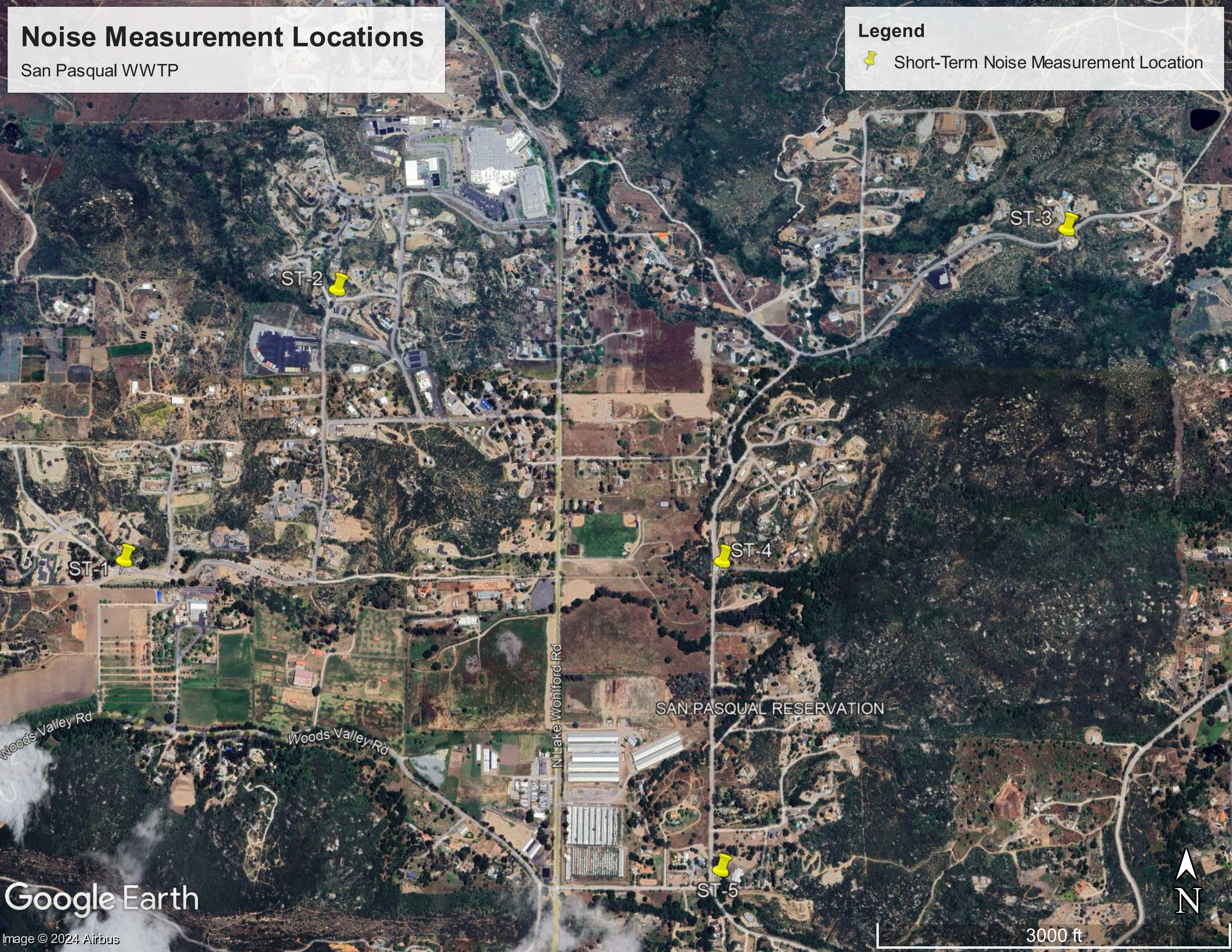
Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Indian Health Service
Department of Health and Human Services
California Area Office
650 Capitol Mall, Suite 7-100
916-930-3981x342 (office)
donna.meyer@ihs.gov

Appendix F – Air Quality and Greenhouse Gas

Due to the size of the Air Quality and Greenhouse Gas appendix, the data has been removed from this public version. The Air Quality and Greenhouse Gas appendix can be provided upon request.

To request the appendix, please email the Indian Health Service Project Engineer Consultant Julia Majkrzak at julia.majkrzak@ihs.gov

Appendix G – Noise Assessment


Noise Measurement Locations
San Pasqual WWTP
Legend
Short-Term Noise Measurement Location
ST-1
ST-2
ST-3
ST-4
ST-5
SAN PASQUAL RESERVATION
N Lake Wohlford Rd
Woods Valley Rd
Woods Valley Rd
Google Earth
Image © 2024 Airbus
3000 ft
N

Noise Measurement Field Data

Project:	San Pasqual WWTP	**Job Number:**	195092102
Site No.:	ST-1	**Date:**	3/7/2024
Analyst:	Skye Hansen and Eric Wang	**Time:**	10:38-10:48
Location:	Corner of Kewaak Wy and Lucky Ln		
Noise Sources:	tractor and farm work		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
45.9	35.8	67.4	82.8

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	52
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.99"
Humidity:	76%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	ST_.006.s	Computer's File Name	LxTse_0005586-20240307 103834-ST_.006.ldbin
Meter	LxT SE 0005586	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-03-07 10:38:34	Duration	0:10:00.0		
End Time	2024-03-07 10:48:34	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-03-06 15:27:18	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	45.9 dB		
LAE	73.7 dB	SEA	--- dB
EA	2.6 µPa²h		
LA_{peak}	82.8 dB	2024-03-07 10:48:33	
LAS_{max}	67.4 dB	2024-03-07 10:38:34	
LAS_{min}	35.8 dB	2024-03-07 10:39:32	
LA_{eq}	45.9 dB		
LC_{eq}	58.5 dB	LC_{eq} - LA_{eq}	12.6 dB
LAI_{eq}	51.2 dB	LAI_{eq} - LA_{eq}	5.3 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

L_{DN}	L_{Day}	L_{Night}
45.9 dB	45.9 dB	0.0 dB

L_{DEN}	L_{Day}	L_{Eve}	L_{Night}
45.9 dB	45.9 dB	--- dB	--- dB

Any Data

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	45.9 dB		58.5 dB		--- dB	
$LS_{(max)}$	67.4 dB	2024-03-07 10:38:34	--- dB	None	--- dB	None
$LS_{(min)}$	35.8 dB	2024-03-07 10:39:32	--- dB	None	--- dB	None
$L_{Peak(max)}$	82.8 dB	2024-03-07 10:48:33	--- dB	None	--- dB	None

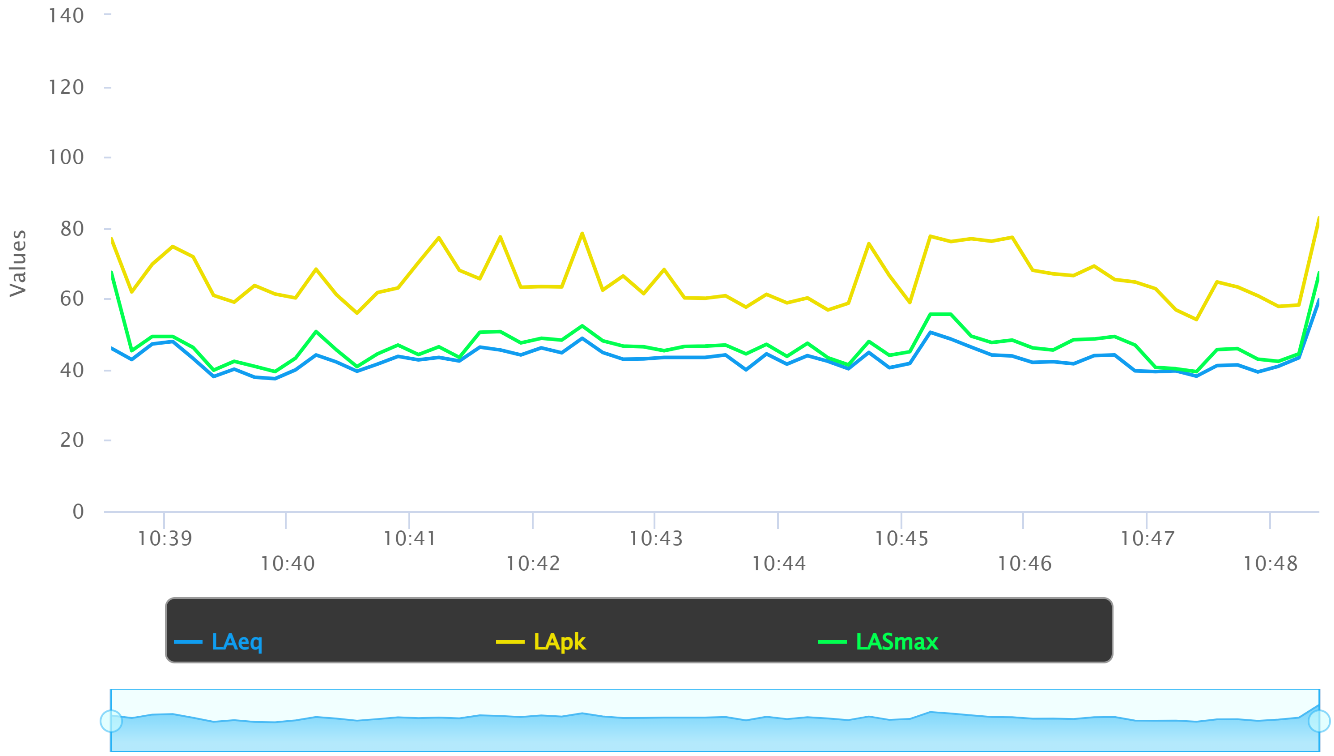
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	48.9 dB
LAS 10.0	47.3 dB
LAS 33.3	43.6 dB
LAS 50.0	42.2 dB
LAS 66.6	40.7 dB
LAS 90.0	38.5 dB

Time History



Noise Measurement Field Data

Project:	San Pasqual WWTP	**Job Number:**	195092102
Site No.:	ST-2	**Date:**	3/7/2024
Analyst:	Skye Hansen and Eric Wang	**Time:**	10:20-10:30
Location:	Corner of Kunyaaw Path and Hatepaa Rd		
Noise Sources:	dog barking and road traffic		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
63.9	39.5	85.3	104.0

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	52
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.99"
Humidity:	76%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	ST_.005.s	Computer's File Name	LxTse_0005586-20240307 102056-ST_.005.ldbin
Meter	LxT SE 0005586	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-03-07 10:20:56	Duration	0:10:00.0		
End Time	2024-03-07 10:30:56	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-03-06 15:27:18	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	63.9 dB		
LAE	91.7 dB	SEA	--- dB
EA	163.6 µPa²h		
LA_{peak}	104.0 dB	2024-03-07 10:21:18	
LAS_{max}	85.3 dB	2024-03-07 10:21:18	
LAS_{min}	39.5 dB	2024-03-07 10:29:01	
LA_{eq}	63.9 dB		
LC_{eq}	68.6 dB	LC_{eq} - LA_{eq}	4.7 dB
LAI_{eq}	72.2 dB	LAI_{eq} - LA_{eq}	8.3 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:00.6
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

L_{DN}	L_{Day}	L_{Night}	
63.9 dB	63.9 dB	0.0 dB	
L_{DEN}	L_{Day}	L_{Eve}	L_{Night}
63.9 dB	63.9 dB	--- dB	--- dB

Any Data

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	63.9 dB		68.6 dB		--- dB	
$LS_{(max)}$	85.3 dB	2024-03-07 10:21:18	--- dB	None	--- dB	None
$LS_{(min)}$	39.5 dB	2024-03-07 10:29:01	--- dB	None	--- dB	None
$L_{Peak(max)}$	104.0 dB	2024-03-07 10:21:18	--- dB	None	--- dB	None

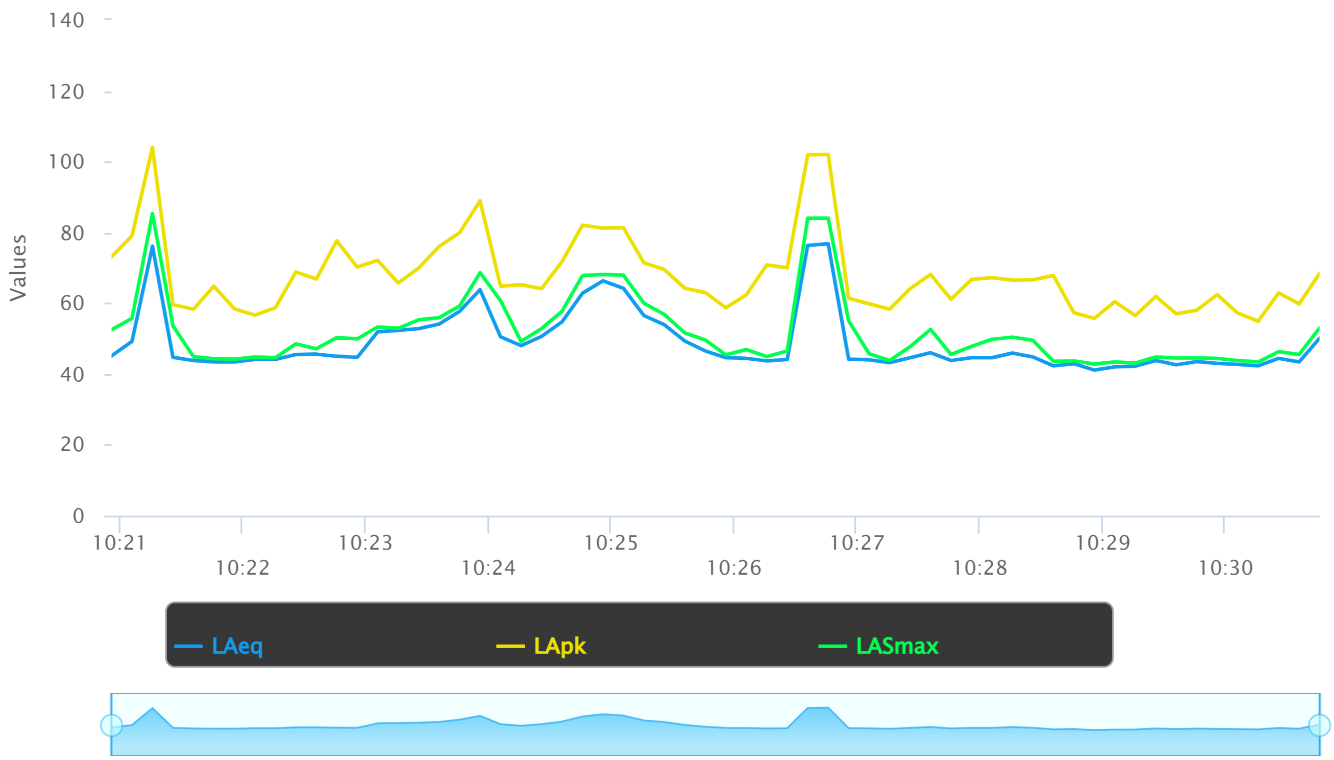
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	65.3 dB
LAS 10.0	58.2 dB
LAS 33.3	47.8 dB
LAS 50.0	44.5 dB
LAS 66.6	43.7 dB
LAS 90.0	42.4 dB

Time History



Noise Measurement Field Data

Project:	San Pasqual WWTP	**Job Number:**	195092102
Site No.:	ST-3	**Date:**	3/7/2024
Analyst:	Skye Hansen and Eric Wang	**Time:**	11:32-11:42
Location:	Corner of E Canal Rd and Vasquez Wy		
Noise Sources:	road traffic and construction noise		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
50.0	40.8	67.3	88.8

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	52
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.99"
Humidity:	76%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	ST_.009.s	Computer's File Name	LxTse_0005586-20240307 113247-ST_.009.ldbin
Meter	LxT SE 0005586	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-03-07 11:32:47	Duration	0:10:00.0		
End Time	2024-03-07 11:42:47	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-03-06 15:27:18	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	50.0 dB		
LAE	77.8 dB	SEA	--- dB
EA	6.7 µPa²h		
LA_{peak}	88.8 dB	2024-03-07 11:38:03	
LAS_{max}	67.3 dB	2024-03-07 11:32:47	
LAS_{min}	40.8 dB	2024-03-07 11:36:40	
LA_{eq}	50.0 dB		
LC_{eq}	62.4 dB	LC_{eq} - LA_{eq}	12.4 dB
LAI_{eq}	52.4 dB	LAI_{eq} - LA_{eq}	2.4 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise	L_{DN}	L_{Day}	L_{Night}	
	50.0 dB	50.0 dB	0.0 dB	
	L_{DEN}	L_{Day}	L_{Eve}	L_{Night}
	50.0 dB	50.0 dB	--- dB	--- dB

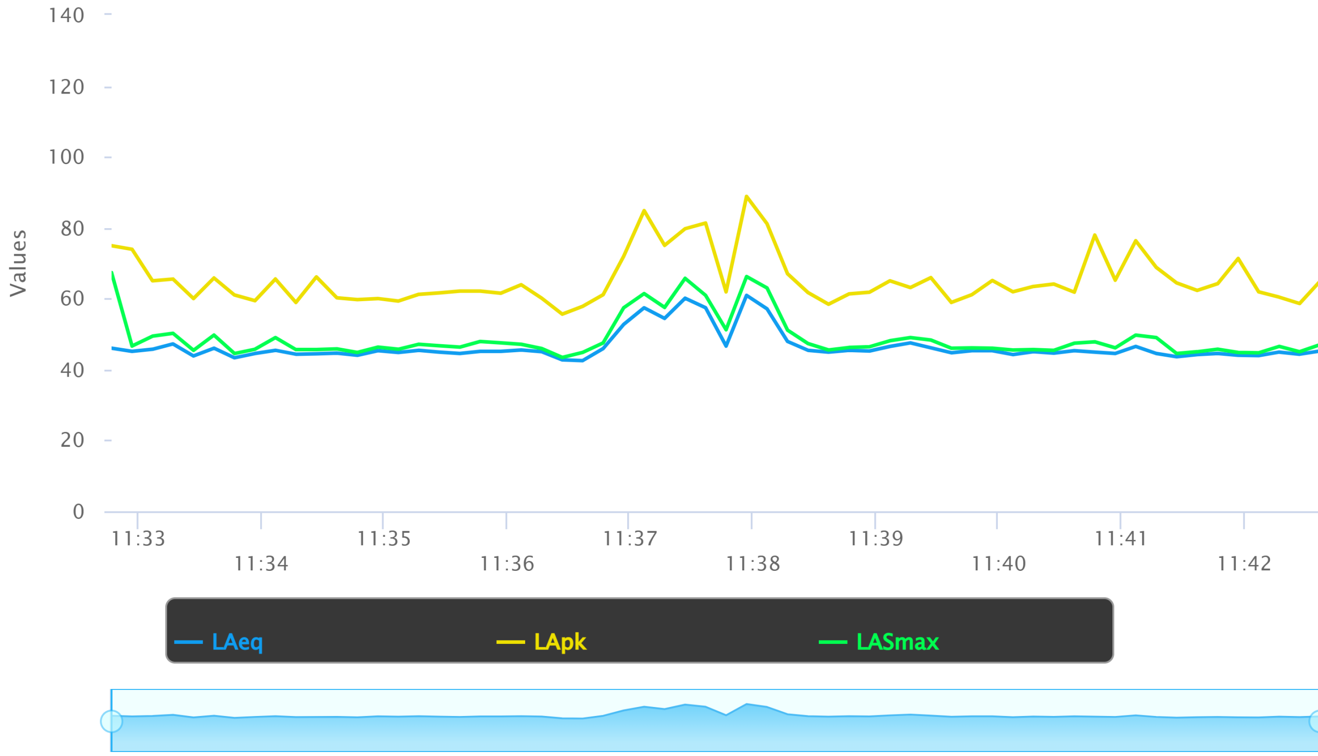
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	50.0 dB		62.4 dB		--- dB	
$L_{S(max)}$	67.3 dB	2024-03-07 11:32:47	--- dB	None	--- dB	None
$L_{S(min)}$	40.8 dB	2024-03-07 11:36:40	--- dB	None	--- dB	None
$L_{Peak(max)}$	88.8 dB	2024-03-07 11:38:03	--- dB	None	--- dB	None

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	54.9 dB
LAS 10.0	50.5 dB
LAS 33.3	45.6 dB
LAS 50.0	44.9 dB
LAS 66.6	44.4 dB
LAS 90.0	43.7 dB

Time History



Noise Measurement Field Data

Project:	San Pasqual WWTP	**Job Number:**	195092102
Site No.:	ST-4	**Date:**	3/7/2024
Analyst:	Skye Hansen and Eric Wang	**Time:**	11:15-11:25
Location:	Corner of E Canal Rd and Eshash Rd		
Noise Sources:	road traffic		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
57.9	36.1	78.3	91.7

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	52
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.99"
Humidity:	76%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	ST_.008.s	Computer's File Name	LxTse_0005586-20240307 111515-ST_.008.ldbin
Meter	LxT SE 0005586	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-03-07 11:15:15	Duration	0:10:00.0		
End Time	2024-03-07 11:25:15	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-03-06 15:27:18	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	57.9 dB		
LAE	85.7 dB	SEA	--- dB
EA	41.1 µPa²h		
LA_{peak}	91.7 dB	2024-03-07 11:24:52	
LAS_{max}	78.3 dB	2024-03-07 11:24:52	
LAS_{min}	36.1 dB	2024-03-07 11:17:49	
LA_{eq}	57.9 dB		
LC_{eq}	63.4 dB	LC_{eq} - LA_{eq}	5.5 dB
LAI_{eq}	60.0 dB	LAI_{eq} - LA_{eq}	2.1 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

L_{DN}	L_{Day}	L_{Night}	
57.9 dB	57.9 dB	0.0 dB	
L_{DEN}	L_{Day}	L_{Eve}	L_{Night}
57.9 dB	57.9 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	57.9 dB		63.4 dB		--- dB	
$LS_{(max)}$	78.3 dB	2024-03-07 11:24:52	--- dB	None	--- dB	None
$LS_{(min)}$	36.1 dB	2024-03-07 11:17:49	--- dB	None	--- dB	None
$L_{Peak(max)}$	91.7 dB	2024-03-07 11:24:52	--- dB	None	--- dB	None

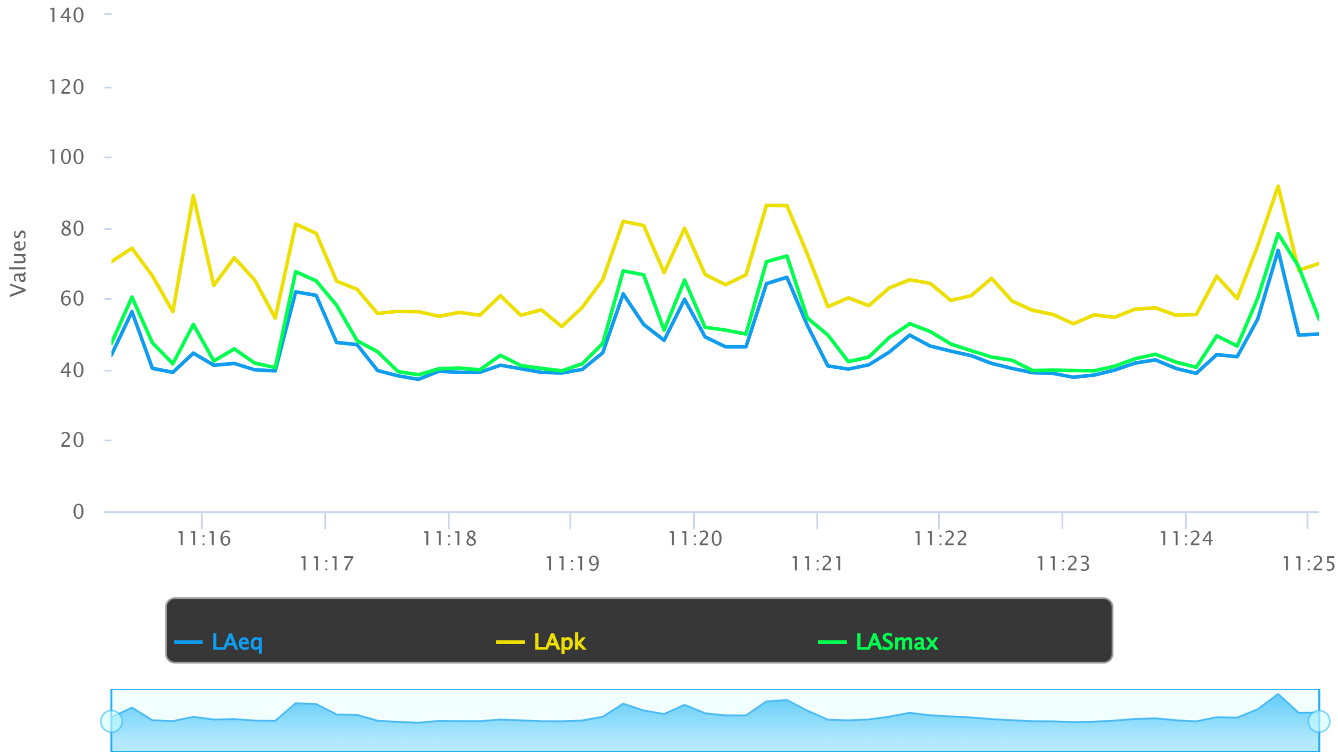
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	62.8 dB
LAS 10.0	54.5 dB
LAS 33.3	45.4 dB
LAS 50.0	42.1 dB
LAS 66.6	40.1 dB
LAS 90.0	38.6 dB

Time History



Noise Measurement Field Data

Project:	San Pasqual WWTP	**Job Number:**	195092102
Site No.:	ST-5	**Date:**	3/7/2024
Analyst:	Skye Hansen and Eric Wang	**Time:**	11:00-11:10
Location:	Corner of Paradise Mountain Rd and Canal Rd		
Noise Sources:	road traffic		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
57.5	40.8	70.1	84.4

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	52
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.99"
Humidity:	76%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	ST_.007.s	Computer's File Name	LxTse_0005586-20240307 110037-ST_.007.ldbin
Meter	LxT SE 0005586	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-03-07 11:00:37	Duration	0:10:00.0		
End Time	2024-03-07 11:10:37	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-03-06 15:27:18	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	57.5 dB		
LAE	85.3 dB	SEA	--- dB
EA	37.5 µPa²h		
LA_{peak}	84.4 dB	2024-03-07 11:01:13	
LAS_{max}	70.1 dB	2024-03-07 11:08:45	
LAS_{min}	40.8 dB	2024-03-07 11:07:00	
LA_{eq}	57.5 dB		
LC_{eq}	66.8 dB	LC_{eq} - LA_{eq}	9.3 dB
LAI_{eq}	59.3 dB	LAI_{eq} - LA_{eq}	1.8 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

L_{DN}	L_{Day}	L_{Night}	
57.5 dB	57.5 dB	0.0 dB	
L_{DEN}	L_{Day}	L_{Eve}	L_{Night}
57.5 dB	57.5 dB	--- dB	--- dB

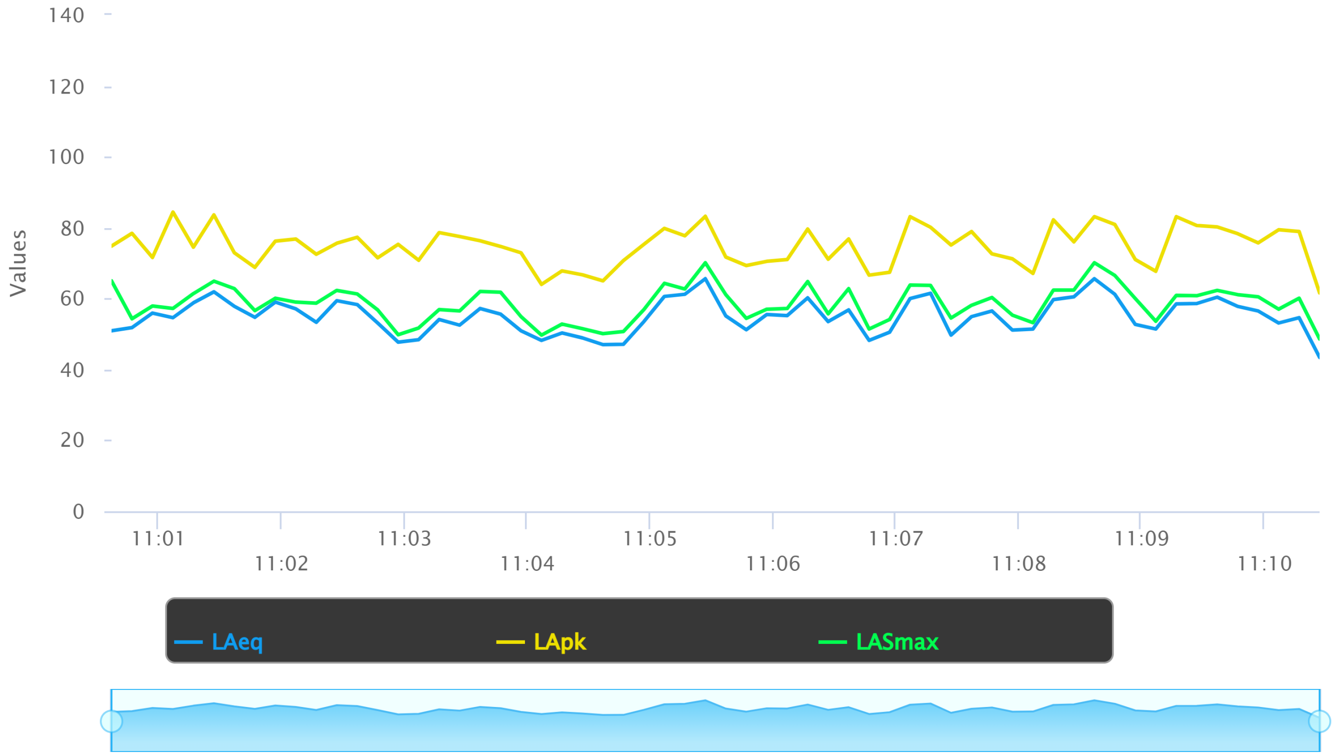
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	57.5 dB		66.8 dB		--- dB	
$LS_{(max)}$	70.1 dB	2024-03-07 11:08:45	--- dB	None	--- dB	None
$LS_{(min)}$	40.8 dB	2024-03-07 11:07:00	--- dB	None	--- dB	None
$L_{Peak(max)}$	84.4 dB	2024-03-07 11:01:13	--- dB	None	--- dB	None

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	62.4 dB
LAS 10.0	61.1 dB
LAS 33.3	57.1 dB
LAS 50.0	54.6 dB
LAS 66.6	51.9 dB
LAS 90.0	47.8 dB

Time History



Project: **San Pasqual WWTP**
Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Residential	25	0	
2	Residential	50	0	
3	Residential	100	0	
4	Residential	150	0	
5	Residential	175	0	
6	Residential	210	0	
7	Residential	215	0	

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4		RECEPTOR 5		RECEPTOR 6		RECEPTOR 7	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**	**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**	**Noise Level at Receptor 4, Lmax**	**Noise Level at Receptor 4, Leq**	**Noise Level at Receptor 5, Lmax**	**Noise Level at Receptor 5, Leq**	**Noise Level at Receptor 6, Lmax**	**Noise Level at Receptor 6, Leq**	**Noise Level at Receptor 7, Lmax**	**Noise Level at Receptor 7, Leq**
WWTP - Initial Construction																		
	Tractor	2	40%	84	93.0	89.1	87.0	83.0	81.0	77.0	77.5	73.5	76.1	72.1	74.5	70.6	74.3	70.4
	Generator	1	50%	81	86.6	83.6	80.6	77.6	74.6	71.6	71.1	68.0	69.7	66.7	68.1	65.1	67.9	64.9
	Crane	1	16%	81	86.6	78.7	80.6	72.6	74.6	66.6	71.1	63.1	69.7	61.8	68.1	60.2	67.9	60.0
	Welder/Torch	1	40%	74	80.0	76.0	74.0	70.0	68.0	64.0	64.5	60.5	63.1	59.1	61.5	57.6	61.3	57.4
	Tractor	2	40%	84	93.0	89.1	87.0	83.0	81.0	77.0	77.5	73.5	76.1	72.1	74.5	70.6	74.3	70.4
	Dump Truck	4	40%	77	88.5	84.6	82.5	78.5	76.5	72.5	73.0	69.0	71.6	67.7	70.1	66.1	69.9	65.9
Combined LEQ						**93.5**		**87.5**		**81.5**		**77.9**		**76.6**		**75.0**		**74.8**

Source for Ref. Noise Levels: RCNM, 2005

Project: **San Pasqual WWTP - Gravity and Recycle Pipes**
Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Residential	25	0	
2	Residential	50	0	
3	Residential	100	0	
4	Residential	168	0	
5	Residential	175	0	
6	Residential	200	0	
7				

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4		RECEPTOR 5		RECEPTOR 6	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**	**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**	**Noise Level at Receptor 4, Lmax**	**Noise Level at Receptor 4, Leq**	**Noise Level at Receptor 5, Lmax**	**Noise Level at Receptor 5, Leq**	**Noise Level at Receptor 6, Lmax**	**Noise Level at Receptor 6, Leq**
Gravity and Recycle Pipes																
	Tractor	2	40%	84	93.0	89.1	87.0	83.0	81.0	77.0	76.5	72.5	76.1	72.1	75.0	71.0
	Dozer	1	40%	82	87.7	83.7	81.7	77.7	75.7	71.7	71.2	67.2	70.8	66.8	69.7	65.7
	Dump Truck	3	40%	77	87.3	83.3	81.3	77.3	75.3	71.3	70.7	66.8	70.4	66.4	69.2	65.3
	Paver	1	50%	77	83.2	80.2	77.2	74.2	71.2	68.2	66.7	63.7	66.3	63.3	65.2	62.1
	Roller	1	20%	80	86.0	79.0	80.0	73.0	74.0	67.0	69.5	62.5	69.1	62.1	68.0	61.0
Combined LEQ						**91.6**		**85.6**		**79.5**		**75.0**		**74.7**		**73.5**

Source for Ref. Noise Levels: RCNM, 2005

Project: San Pasqual WWTP - Lift Stations

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Residential	25	0	
2	Residential	50	0	
3	Residential	100	0	
4	Residential	169	0	
5	Residential	175	0	
6	Residential	200	0	
7				

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4		RECEPTOR 5		RECEPTOR 6	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**	**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**	**Noise Level at Receptor 4, Lmax**	**Noise Level at Receptor 4, Leq**	**Noise Level at Receptor 5, Lmax**	**Noise Level at Receptor 5, Leq**	**Noise Level at Receptor 6, Lmax**	**Noise Level at Receptor 6, Leq**
Lift Stations																
	Tractor	2	40%	84	93.0	89.1	87.0	83.0	81.0	77.0	76.4	72.5	76.1	72.1	75.0	71.0
	Generator	1	50%	81	86.6	83.6	80.6	77.6	74.6	71.6	70.0	67.0	69.7	66.7	68.6	65.5
	Crane	3	16%	81	91.4	83.4	85.4	77.4	79.4	71.4	74.8	66.8	74.5	66.5	73.3	65.4
	Welder/Torch	1	40%	74	80.0	76.0	74.0	70.0	68.0	64.0	63.4	59.4	63.1	59.1	62.0	58.0
	Backhoe	2	40%	78	86.6	82.7	80.6	76.6	74.6	70.6	70.0	66.1	69.7	65.7	68.6	64.6
	Dump Truck	3														
Combined LEQ						**91.7**		**85.7**		**79.7**		**75.1**		**74.8**		**73.6**

Source for Ref. Noise Levels: RCNM, 2005

Project: San Pasqual WWTP - Sewer Force Mains

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Residential	25	0	
2	Residential	50	0	
3	Residential	100	0	
4	Residential	125	0	
5	Residential	150	0	
6	Residential	175	0	
7	Residential	200	0	

					RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4		RECEPTOR 5		RECEPTOR 6		RECEPTOR 7	
Construction Phase	**Equipment Type**	**No. of Equip.**	**Acoustical Usage Factor**	**Reference Noise Level at 50ft per Unit, Lmax**	**Noise Level at Receptor 1, Lmax**	**Noise Level at Receptor 1, Leq**	**Noise Level at Receptor 2, Lmax**	**Noise Level at Receptor 2, Leq**	**Noise Level at Receptor 3, Lmax**	**Noise Level at Receptor 3, Leq**	**Noise Level at Receptor 4, Lmax**	**Noise Level at Receptor 4, Leq**	**Noise Level at Receptor 5, Lmax**	**Noise Level at Receptor 5, Leq**	**Noise Level at Receptor 6, Lmax**	**Noise Level at Receptor 6, Leq**	**Noise Level at Receptor 7, Lmax**	**Noise Level at Receptor 7, Leq**
Lift Stations																		
	Tractor	1	40%	84	90.0	86.0	84.0	80.0	78.0	74.0	76.0	72.1	74.5	70.5	73.1	69.1	72.0	68.0
	Dozer	1	40%	82	87.7	83.7	81.7	77.7	75.7	71.7	73.7	69.8	72.2	68.2	70.8	66.8	69.7	65.7
	Dump Truck	3	40%	77	87.3	83.3	81.3	77.3	75.3	71.3	73.3	69.3	71.7	67.7	70.4	66.4	69.2	65.3
	Paver	1	50%	77	83.2	80.2	77.2	74.2	71.2	68.2	69.2	66.2	67.7	64.6	66.3	63.3	65.2	62.1
	Roller	1	20%	80	86.0	79.0	80.0	73.0	74.0	67.0	72.0	65.1	70.5	63.5	69.1	62.1	68.0	61.0
Combined LEQ						**90.2**		**84.1**		**78.1**		**76.2**		**74.6**		**73.3**		**72.1**

Source for Ref. Noise Levels: RCNM, 2005

Appendix H – Historic Property Inventory

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

October 24, 2024

Ms. Desiree Morales-Whitman
Tribal Historic Preservation Officer
San Pasqual Band of Diegueno Mission Indians
P.O. Box 365
Valley Center, CA 92082

RE: CA17-E61: San Pasqual Wastewater Improvements

Dear Ms. Morales-Whitman:

The U.S. Department of Health and Human Services (DHHS), Indian Health Service (IHS) intends to provide technical and financial assistance (undertaking) under the Sanitation Facilities Construction (SFC) program to construct a wastewater collection and treatment facility. The proposed project would involve a community sewer system that consists of gravity piping, lift stations, force mains, a Wastewater Treatment Plant (WWTP) and associated facilities to treat the sewage generated on the Reservation. The proposed project also includes a recycled water distribution network for use throughout the Reservation. The proposed project is located on the San Pasqual Band of Diegueno Mission Indians Reservation, Valley Center, San Diego County within Sections 14, 15, 21, and 22, Township 11S, Range 1W, of the USGS 2021 Rodriquez Mountain 7.5 minute quadrangle (33.142268, -116.790850).

IHS's action of providing Federal financial assistance meets the definition of an Undertaking in accordance with 36 CFR Part 800.16(y) and therefore requires the completion of a Section 106 review. The APE was defined in consultation with representatives of the Band and IHS. The horizontal APE has been identified as 173 acres of land, which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for the proposed WWTP. A vertical APE has been identified as a maximum of 25 deep. IHS has determined that the proposed undertaking and subsequent construction would result in "Historic Properties Present – No Adverse Effect" in accordance with 36 CFR Part 800.4(d)(1).

However, in accordance with the implementing regulations for Section 106 (36 CFR Part 800.2(i)(A)), of the National Historic Preservation Act (16 U.S.C. §470t) we are seeking your concurrence on the Area of Potential Effect (APE) and Finding of Effect (FOE). If historic properties are inadvertently discovered during ground disturbing activities all work would cease within a 100-foot radius and you and the CAO Environmental Protection Specialist would be contacted immediately to address necessary mitigation measures to avoid any adverse effect.

IHS will authorize funding for the proposed undertaking unless you notify IHS of your non-concurrence within 30 days of your receipt of this documentation. If you should require further clarification or need additional information, please contact me at (916) 930-3981 ext.342 or donna.meyer@ihs.gov. If you concur with our determination please sign below, date and return to my attention.

Sincerely,

Donna M. Meyer

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
CAO Environmental-Historic Coordinator

Enclosure

I concur with the IHS Area of Potential Effect and "Historic Properties Present – No Adverse Effect" determination on this proposed Undertaking.

Desiree M. Whitman
Ms. Desiree Morales-Whitman

12/3/24
Date

Historic Property Inventory
for the
San Pasqual Community Sewer System Project,
San Pasqual Reservation, San Diego County, California

CONFIDENTIAL

July 2024

Prepared By:

Jessica Mauck, MA, RPA

Senior Project Manager / Archaeologist

Jamie Nord, MA, RPA

Archaeologist

Kimley-Horn and Associates, Inc.

3801 University Ave, Ste 300

Riverside, CA 92501

EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc. (KHA) is under contract by the San Pasqual Band of Mission Indians (Band) to complete a Historic Properties Inventory (HPI) for the San Pasqual Community Sewer System Project (undertaking) located on the San Pasqual Reservation within San Diego County, California. The proposed project consists of construction of a wastewater collection, treatment and disposal system within defined areas of the Reservation. The federal undertaking is the Indian Health Service's (IHS) provision of financial assistance to the San Pasqual Band in support of the proposed construction project. The undertaking is being pursued for the Band in conjunction with, and with oversight from, the IHS, with the San Pasqual Tribal Historic Preservation Officer (THPO) providing oversight for all efforts related to the inventory and consideration of historic properties that may be adversely affected as a result of the undertaking. This report is intended to support those efforts and was prepared pursuant to requirements set forth under Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA), as well as the Indian Health Service Environmental Review Manual. The IHS is the lead Federal agency responsible for compliance with Section 106 and its implementing regulations found at 36 CFR Part 800.

The Area of Potential Effects (APE) for the undertaking is defined as 173 acres of land, which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP). It consists mostly of existing roadway, though does contain intact native soil outside of the roads and within the proposed location of the WWTP. A Sacred Lands File (SLF) search was conducted by the Native American Heritage Commission (NAHC) for the APE and adjacent areas on December 15, 2023 and produced negative results. A historic and archaeological resources records search was conducted through the South Coastal Information Center (SCIC) for the APE plus a 1-mile buffer on January 3, 2024 and produced positive results. Specifically, the records search results noted that 116 cultural resources studies have taken place within 1-mile of the APE, 38 of which included a portion of the APE. Additionally, the results noted 115 cultural resources were recorded within 1-mile of the APE, 15 of which overlapped with the APE. Previously recorded resources within the APE include 14 prehistoric archaeological sites and one (1) historic built environment resource (Escondido Canal). An intensive-level pedestrian field survey was conducted within the entirety of the APE from January 16 through January 19, 2024. During the field survey, all 15 previously recorded cultural resource site boundaries were relocated, though no cultural resources were identified at nine (9) sites. Additionally, eight (8) new cultural resources were recorded, which includes four (4) prehistoric isolates, two (2) prehistoric archaeological sites, one (1) multicomponent archaeological site, and one (1) historic built environment resource. As such, a total of 23 cultural resources were identified within the APE for the undertaking as a result of the records search and survey efforts, including four (4) prehistoric isolates, 16 prehistoric archaeological sites, one (1) multicomponent archaeological site, and two (2) historic built environment resources.

Of the 23 cultural resources identified within the APE, three (3) resources (CA-SDI-257, SDI-9916, and SDI-15666) exhibit the qualities required for eligibility for listing in the National Register of Historic Places (NRHP) and are recommended potential Historic Properties under Section 106 of the NHPA. The other 20 resources were not identified as eligible for listing in the National Register of Historic Places or as Historic Properties under 36 CFR Part 800.16(l)(1). Various uses of the area (i.e., residential development) and exposures to heavy rain/flooding have greatly impacted the physical integrity of cultural resources recorded on site. The entire APE maintains a high archaeological sensitivity of surface and buried resources. Due to the presence of three (3) potential Historic Properties within the APE, this study recommends avoidance/preservation or data recovery if avoidance is not feasible, an avoidance,

minimization and mitigation plan, archaeological resource training, and monitoring. With these recommendations implemented, the undertaking is unlikely to result in an adverse effect to Historic Properties, and it is recommended that the undertaking be provided a finding of Historic Properties Present – No Adverse Effect.

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INTRODUCTION

Kimley-Horn and Associates, Inc. (KHA) is under contract by the San Pasqual Band of Mission Indians (San Pasqual) to complete a Historic Properties Inventory (HPI) for the San Pasqual Community Sewer System Project (undertaking) located on the San Pasqual Reservation within San Diego County, California. The proposed construction project consists of expanding sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The federal undertaking is the Indian Health Service's (IHS) provision of financial assistance to the San Pasqual Band in support of the proposed construction project. The undertaking is being pursued for the Tribe in conjunction with, and with oversight from IHS with the San Pasqual Tribal Historic Preservation Officer (THPO) providing oversight for all efforts related to the inventory and consideration of historic properties that may be adversely affected as a result of the undertaking. This report is intended to support those efforts and was prepared pursuant to requirements set forth under Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA), as well as the Indian Health Service Environmental Review Manual. The IHS is the lead Federal agency responsible for compliance with Section 106 and its implementing regulations found at 36 CFR Part 800.

PROJECT DESCRIPTION

The undertaking is located on the San Pasqual Reservation near Valley Center in northern San Diego County, California within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (Figures 1-2). The Area of Potential Effects (APE) for the undertaking is defined as 173 acres of land, which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP). The APE was defined in consultation with representatives of the Band and IHS. It consists mostly of existing roadway, though does contain intact native soil outside of the roads and within the proposed location of the WWTP. It is primarily north of Woods Valley Road and bisected by North Lake Wohlford Road, and surrounded by a mix of land uses, including residential housing and agricultural, as well as a large amount of undeveloped vacant land.

REGULATORY SETTING

National Environmental Policy Act

The National Environmental Policy Act (NEPA) establishes the federal policy of protecting significant historic, cultural, and natural aspects of our national heritage during federal project planning. All federal or federally assisted projects requiring action pursuant to Section 102 of NEPA must take into account the effects on cultural resources. According to the NEPA regulations, in considering whether an action may "significantly affect the quality of the human environment," an agency must consider, among other things, unique characteristics of the geographic area such as proximity to historic or cultural resources (40 Code of Federal Regulations [C.F.R.] § 1508.27[b][3]) and the degree to which the action may adversely affect resources listed in or eligible for listing in the National Register of Historic Places (National Register) [C.F.R.] § 1508.27[b][8]). NEPA regulations also require that, to the fullest extent possible, agencies shall prepare draft environmental documents concurrently with and integrated with environmental impact analyses and related surveys and studies required by the National Historic Preservation Act (NHPA). When Section 106 of the NHPA and NEPA are integrated, project actions that cause adverse effects under Section 106 are usually considered to be significant under NEPA.

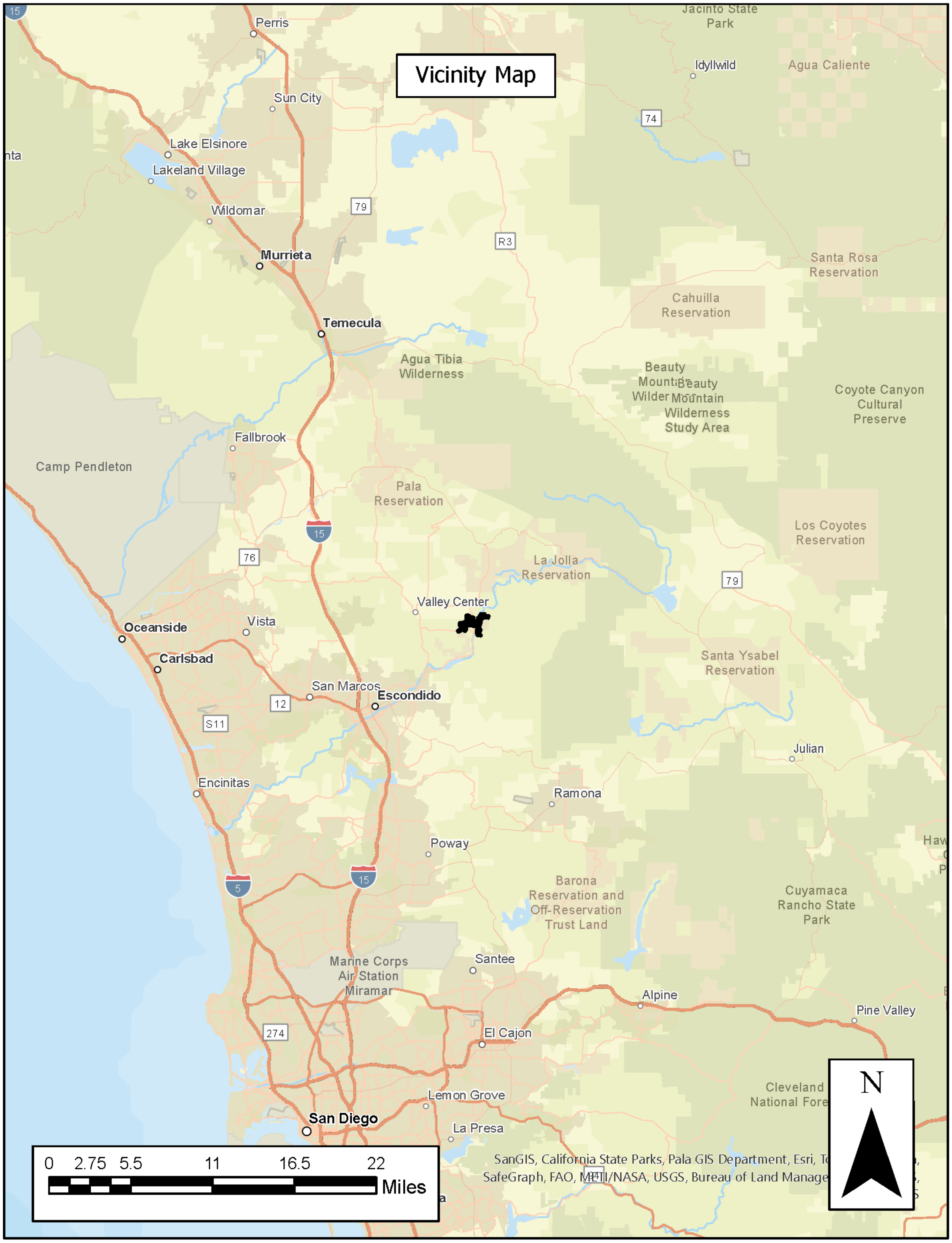

Figure 1: Vicinity Map

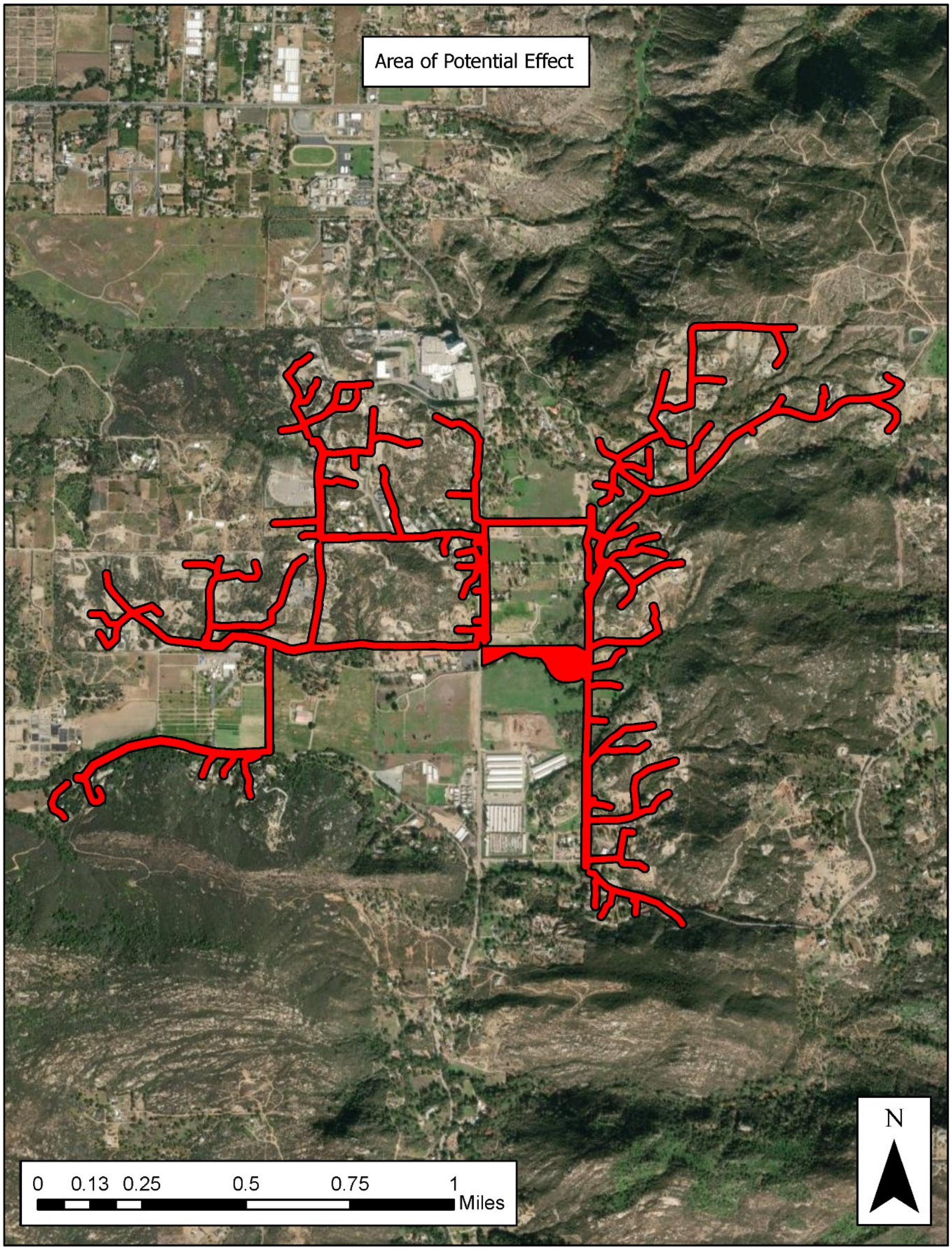

Figure 2: Area of Potential Effect

National Historic Preservation Act

The National Historic Preservation Act (NHPA) establishes the federal government policy on historic preservation and the programs through which this policy is implemented. Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. Historic Properties also include resources determined to be National Historic Landmarks (NHLs). NHLs are nationally significant historic places designated by the Secretary of the Interior (SOI) because they possess exceptional value or quality in illustrating or interpreting United States heritage. A property is considered historically significant if it meets one or more of the NRHP criteria and retains sufficient historic integrity to be able to convey its significance. This act also established the Advisory Council on Historic Preservation (ACHP), an independent agency responsible for implementing Section 106 of NHPA by developing procedures to protect historic resources included in, or eligible for inclusion in, the NRHP.

Section 106 of the NHPA requires that effects on historic properties be taken into consideration in any federal undertaking. The process has five steps: (1) initiating the Section 106 process, (2) identifying Historic Properties, (3) assessing adverse effects to Historic Properties, (4) resolving adverse effects, and (5) implementing stipulations in an agreement document. Section 106 affords the ACHP and the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), as well as other consulting parties, a reasonable opportunity to comment on any undertaking that would adversely affect Historic Properties. SHPOs administer the national historic preservation program at the state level, review NRHP nominations, maintain data on historic properties that have been identified but not yet nominated, and consult with federal agencies during Section 106 review. For lands held in Trust for use by a Federally-recognized Tribe, the duties of the SHPO may instead be carried out by a THPO recognized by the National THPO Program administered by the U.S. Department of Interior - National Park Service (NPS). Such authority has been granted to the San Pasqual Band of Mission Indians and, therefore, NHPA actions and responsibilities outlined in this section reside with the San Pasqual THPO.

Eligibility for the NRHP rests on two factors: significance and integrity. In order to be eligible for inclusion in the National Register, a property must meet one or more of the criteria listed below (36 CFR § 60.4) and retain integrity:

- Criterion A: Association with “events that have made a significant contribution to the broad patterns of our history.”
- Criterion B: Association with “the lives of persons significant in our past.”
- Criterion C: Resources “that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.”
- Criterion D: Resources “that have yielded, or may be likely to yield, information important to history or prehistory.”

The National Register bulletin entitled *How to Apply the National Register Criteria for Evaluation* states that in order for a property to qualify for listing in the National Register, it must meet at least one of the National Register criteria by: (1) being associated with an important historic context, and (2) retaining historic integrity of those features necessary to convey its significance (National Park Service 1997). The historic context of a resource will define the theme(s), geographical limits, and period of significance by which to evaluate a resource's significance (National Park Service 1997:7). Generally, cultural properties must be 50 years of age or more to be eligible for listing in the National Register. According to the National Park Service (1997:2), "properties that have achieved significance within the past 50 years shall not be considered eligible" unless such properties are "of exceptional importance." In addition to being significant under one or more of these criteria, NRHP eligibility requires that a resource retain sufficient integrity to convey its significance. Integrity is evaluated through consideration of characteristics that existed during a property's period of significance. Integrity is evaluated with regard to the retention of seven elements:

- Location: The place where the historic property was constructed
- Design: The combination of elements that create the form, plans, space, structure, and style of a property
- Setting: The physical environment of the historic property, including the landscape and spatial relationship of the buildings
- Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern of configuration to form the historic property
- Workmanship: The physical evidence of the crafts of a particular culture or people during any given period of history or prehistory
- Feeling: The property's expression of the aesthetic or historic sense of a particular period of time
- Association: The direct link between an important historic event or person and a historic property

The NHPA allows properties of traditional religious and cultural importance to a Native American tribe to be eligible for NRHP inclusion (Section 101(d)(6)(A)). Additionally, a broader range of Traditional Cultural Properties (TCPs) are also considered and may be eligible for or listed in the NRHP. TCPs are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and that may be eligible because of their association with cultural practices or beliefs of living communities that are rooted in that community's history and are important in maintaining the continuing the community's traditional beliefs and practices.

Section 106 of the National Historic Preservation Act of 1966 requires tribal consultation in all steps of the process when a federal agency undertaking or effort may affect historic properties that are either located on tribal lands, or when any Native American tribe or Native Hawaiian organization attaches religious or cultural significance to the historic property, regardless of the property's location ((36 CFR Part 800.2(c)(2)(B)(ii).

Native American Graves Protection and Repatriation Act

The Native American Grave Protection and Repatriation Act (25 U.S. Code 3001–3013) describes the rights of Native American lineal descendants, Indian tribes, and Native Hawaiian organizations with respect to the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony, referred to collectively in the statutes as cultural items, with which they can show a relationship of lineal descent or cultural affiliation. One purpose of the statute is to provide greater protection for Native American burial sites and more careful control over the removal of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony on federal and tribal lands.

NATURAL SETTING

The project is located in northern San Diego County to the east of Valley Center within the San Luis Rey River Basin. Most of the County is made up of Peninsular Ranges Geomorphic Provinces, which are a series of mountain ranges separated by northwest trending valleys (United States Geological Survey). The San Luis Rey River runs north/south through the San Pasqual Reservation, though is modernly channelized via the Escondido Canal. The geology of the area is a mix of Quaternary Alluvium (Qal) and Mesozoic Granitic Rocks (gr). The majority of the APE contains alluvium deposits, primarily east-west along (and just north of) Woods Valley Road, as well as north-south on either side of the Escondido Canal and as far west as Lake Wohlford Road. In contrast, the periphery of the APE primarily contains older granitic deposits (Biehler et al. 2004).

The Basin has largely dried up as a result of channelization of the San Luis Rey River, which likely had a strong impact of the flora and fauna in the region (San Luis Rey Indian Water Authority). The bulk of the APE was developed with roadway, though some of the fauna present within general area include several species of mice and bats, desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), desert wood rat (*Neotoma lepida*), coyote (*Canis latrans*), waterfowl, and ducks. Flora in the area mainly consists of non-native grasslands and chaparral habitat that presently dominate the landscape in the general area, though native chaparral vegetation would have included manzanita, chamise, oak trees, and ceanothus (Red Tail Environmental). The area allocated for development of a Wastewater Treatment Plant (WWTP) retains the most native flora within the APE.

ETHNOGRAPHIC BACKGROUND

The project lies within the Reservation of the San Pasqual Band of Mission Indians, a Kumeyaay community who has occupied this space since its establishment in 1910. However, the project area lies within the ancestral territory of *Payómkawichum*, often referred to by their Spanish-given name of Luiseño. Although Alfred Kroeber recorded the territories of southern California tribes in 1925, these “borders” remain subject to alteration for two reasons: first, territories were flexible and changed over time, and secondly, indigenous borders and land use were not recorded until after European contact nearly destroyed native lifeways. Even so, available ethnographic, archaeological, and historic evidence exists to support the prehistoric use of the area by the Luiseño and historic use by the Kumeyaay (or, as referred to by the Spanish, the Diegueño).

Payómkawichum/Luiseño

The Luiseño language is part of the Cupan group of the Takic subfamily, which also includes Serrano and Kitanemuk, and is considered a part of the larger Uto-Aztecan family (Bean and Shipek 1978). The Luiseño inhabited a territory that extended from Agua Hedionda Creek to the south, near Aliso Creek to the northwest, inland to Santiago Peak, east of Palomar Mountain, and above the valley of San Jose. Overall, their ancestral territory was almost 1,000,000 acres in size, and included most of the San Luis Rey River and Santa Margarita River drainages. Settlements and villages were typically located within valley bottoms and/or along streams or coastal strands near mountain ranges. Group economic activities were restricted to areas owned by the village as a whole, whereas familial gatherings were limited to areas “owned” by the family. Hunting activities engaged both individual and group participation, with the use of bows and arrows for larger game and curved throwing sticks, slings, traps, or pit type deadfalls for smaller animals. They hunted an array of mammals, including deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, valley and mountain quail, doves, ducks, and other birds. (Bean and Shipek 1978). Other important items were acorns, grasses, manzanita, sunflower, chia, sage, lemonade berry, prickly pear, and pine nuts. Tools for the gathering, storing, and preparing food varied and were generally constructed from local materials (Bean and Shipek 1978).

Records show that the long history of European colonization and harmful displacement of Native Americans in the region began when Father Juan Norberto de Santiago rode through the area in 1797 from Mission San Juan Capistrano seeking a location for a new mission. One year later, the Mission San Luis Rey de Francia was established as the state's 18th mission near the southern border of what is now Camp Pendleton, where many regional Native Americans were taken for conversion (Missions California). Due in part to the introduction of new diseases, as well as the harsh conditions of mission life, the indigenous population quickly dwindled and cultural practices were lost. In the 1800s, both the Federal and State governments promoted military campaigns to eliminate remaining indigenous populations or remove them to Reservations. Over the course of the twentieth century, many indigenous people were moved to Reservations, while others dispersed to towns and cities throughout California. Native American Tribes affiliated with the Payómkawichum/ Luiseño include Pechanga, Pauma, Pala, Rincon, San Luis Rey, La Jolla, and Soboba. These communities, despite the many attempts at erasure and setbacks, have remained highly active in their heritage stewardship well into the present day (Pechanga Band of Indians).

Kumeyaay/Diegueño

The project area lies within the present-day San Pasqual Reservation, the original boundaries of which were established in 1910 under the authority of an Act of January 12, 1891. In 1911, an Executive Order was used that set aside additional land for the Reservation, which was later annexed in 1972 (SCTCA). However, the Native Americans that would later be removed to the Reservation inhabited the area in and around Santa Ysabel Creek. As a Kumeyaay community, they occupied what was the northernmost portion of Kumeyaay ancestral territory (San Pasqual Band of Mission Indians). The Kumeyaay, who are known as the First People, are the Native inhabitants of San Diego County. They were referred to as the Diegueño by Spanish missionaries and explorers. The Kumeyaay are Yuman-speaking people, which is a branch of the Hokan language family. They practiced a hunting and gathering economy, with a heavy emphasis on the exploitation of acorns, and produced a variety of stone tools fashioned from locally available materials for food processing, such as mortars, pestles, and other milling stones. Traditional Kumeyaay games included peon and other hand games, and they heavily engaged in Bird Singing during ceremony. Prior to contact, the tribe was divided into approximately 50 different clans across the County. They were patrilineal and exogamous, though their people traveled seasonally throughout their territory (San Pasqual Band of Mission Indians; SCTCA).

However, many Kumeyaay were displaced from their ancestral homes after the arrival of the Spaniards and the establishment of Mission San Diego de Alcala in 1769. Many were killed or otherwise pushed out of their lands, while many were missionized and converted to Christianity, including many of the San Pasqual community inhabiting Santa Ysabel Creek (San Pasqual Band of Mission Indians). However, in 1821, after the Mexican War of Independence established Mexican rule over the area, the missions began to close. By 1833, with the official closing of Mission San Diego de Alcala, the remaining Kumeyaay re-settled in the area via three "pueblos" established near the missions by Governor Jose Figueroa. The San Pasqual Pueblo was officially established in 1835, though only an estimated 81 San Pasqual Kumeyaay had survived and made their way to the location. They were later joined by other Kumeyaay and unconverted Native Americans from the now-closed San Luis Rey Mission and other areas. After the start of the American Period in 1848, the American government engaged in treaty negotiations with several Tribes and Tribal representatives, including many Kumeyaay. However, the treaties were ultimately rejected and the Kumeyaay continued to face hardship in the new area, including an influx of homesteaders and squatters (San Pasqual Band of Mission Indians). The area near San Ysabel Creek was highly coveted land for raising cattle and growing crops, and even President Grant's attempt to establish the land as a reservation for the local San Pasqual Kumeyaay failed due to pressure from settlers. The valley was ultimately cleared of all Native Americans by 1878 and the remaining San Pasqual Kumeyaay spread out across the region, with some joining other Kumeyaay bands and others occupying Euro-settled towns. While it was a bleak time for the San Pasqual community, a number of families filed land claims on fields north of San Ysabel Creek, which ultimately led to an investigation by the American government and subsequent establishment of these lands as the original Reservation. Today, the Kumeyaay are represented across 13 bands, including the modern inhabitants of the San Pasqual Reservation, which is overseen by the Tribal Government of the San Pasqual Band of Mission Indians (San Pasqual Band of Mission Indians).

PREHISTORIC SETTING

Within the County, scientific research supports that human occupation began around 12,000 years ago (Fagan 2003; Gallegos 2017). The prehistoric cultural setting of the area has been organized into many chronological frameworks within the scientific community (Moratto 1984; Moriarty 1969; Rogers 1966; Warren 1966). Archaeologists typically divide the prehistoric period into three main occupation eras: the Terminal Pleistocene/Early Holocene Period, the Middle Holocene Period, and the Late Holocene Period. However, there is no standard sequence for the region, in part due to the enormity of the land base and lack of cohesive study of prior archaeological research across the area. It is further important to note that little attempt has been made to revisit the chronologies of the region since the 1990s and, therefore, prior attempts further lack data related to more recent research, as well as lack of oral histories from descendent communities that have become more available in recent decades.

Terminal Pleistocene/Early Holocene Period (12,000-6,000 B.C.)

In San Diego County, this period is known as the Paleo-Indian period or, more commonly, the San Dieguito. San Dieguito sites known as "Clovis Complex" sites, which are defined by the use of large fluted projectile points and other large bifacial stone tools, have been located across North America, some of which have dated to over 13,500 B.P. In San Diego County, three (3) isolated fluted points have been recorded, though none that are associated with radiocarbon dates or in association with Pleistocene fauna (Davis and Shutler 1969, Kline and Kline 2007, Rondeau et al. 2007). San Dieguito was defined by Warren (1968) at the C.W. Harris Site (SDI-149) and was characterized by leaf shaped and large stemmed projectile points, scrapers and other stone tools that were technologically similar to the Western Stemmed Point Tradition (WSPT) or Western Pluvial Lakes Tradition (WPLT). Archaeological evidence of the WSPT has been found across the western interior of North America with radiocarbon dates ranging from 8,000 to 6,500 calibrated years (cal) BCE (before the current era). (Byrd and Raab 2007; Gallegos 2017; Sutton 2016; Warren 1968). These are generally considered the oldest evidence of human occupation within the County.

Middle/Late Holocene Period (6000 B.C.- A.D. 800)

This period, also known as the Millingstone Horizon, Archaic Period, or the La Jolla Complex in San Diego County, is defined through the presence of specialized tools utilized for hunting a variety of small-to-medium game animals, collecting/processing small plant seeds, and exploiting marine resources along the coast (Byrd and Raab 2007; Hale 2009; Warren 1968). Though evidence shows milling tools were in use as early as 9,000 years ago, the regular use of milling tools is generally attributed to the La Jolla Complex. This period is characterized as having long-term stability with very little technological changes identified within the archaeological record (Byrd and Raab 2007, Hale 2009). These sites often contain a large number of shellfish remains, large numbers of small sandstone mortars or bowls, and stone tools described as “expedient” such as choppers, scrapers, handstones, milling slabs, basin metates, discoidals, and Pinto and Elko projectile points (Moriarty 1966, Gallegos 2017, Hale 2009).

Late Holocene Period (A.D. 800-1769)

This period is defined by the introduction of the bow and arrow after approximately A.D. 500 and the use of ceramics after approximately A.D. 1000 (Byrd and Raab 2007). It is estimated that this transition was a result of an influx of migrating populations into San Diego County, though the exact cause is unknown (Laylander 2014). There are numerous Late Holocene Period sites that are plentiful across San Diego County, many of which are located inland and contain bedrock milling features, thought to relate to acorn or other seed processing. Native populations lived in larger coastal and lower valley villages that were located near permanent water sources and were generally occupied all year. Smaller villages and residential areas were inhabited seasonally and were located near subsistence resources or were used for specialized activities, especially in inland areas (Byrd and Raab 2007; Lightfoot and Parrish 2009). Early archaeological studies in the County conducted by Malcolm Rogers reported archaeological evidence of brush house structures, stone enclosures, sweathouses, hearths, roasting pits, granary bases, and bedrock milling features as well as both pictographs and petroglyphs, most of which has been attributed to this late period (Gallegos 2017). Ceramic use entered the region during this period, and though there is a wide variety of dates proposed for the introduction of ceramics in various parts of the County, there is a consensus that ceramic use spread from the eastern deserts to the center of San Diego County and then to northern San Diego County (Gallegos 2017; Hale 2009; Schaefer and Laylander 2007). Research shows that there was a decline in use of large mammals and an increase in the use of smaller terrestrial mammals, especially rabbits, during this period (Christenson 1990). This subsistence practice is linked to the use of bow and arrows, with the earliest arrow points in San Diego County dating between A.D. 490-650 and A.D. 690, with small projectile points making their way across the County in large quantities by A.D. 1000 (Hale 2009). Common materials for formed tools, primarily projectile points, include chert, jasper, agate, fossilized wood, rhyolite, wonderstone, quartz, obsidian, and Santiago Peak metavolcanics (Lightfoot and Parrish 2009).

HISTORIC SETTING

The Contact/Historic-era California is generally divided into three periods: the Spanish or Mission Period (1769-1821), the Mexican or Rancho Period (1821-1848), and the American Period (1848 to present).

Spanish/Mission Period (1769-1821)

The first recorded European to pass through the region was Junípero Serra, a Spanish friar who later established the nearby Mission San Diego de Alcalá in 1769. At this time, an estimated thousands of Native Americans were either taken into the Mission system, forced to work in construction and/or agricultural labor, fled the region, or were killed. In 1821, Mexico overthrew Spanish rule and the Missions began to decline. By 1833, the Mexican government passed the Secularization Act and the Missions, reorganized as parish churches, lost their vast land holdings, and released the indigenous people that remained. However, the remaining Native Americans continued to face issues under Mexican rule and were eventually forced to provide labor for various industries, such as agriculture, lumber, etc.

Mexican/Rancho Period (1821-1848)

In 1848, the Treaty of Guadalupe Hidalgo was introduced, triggering the start of the American Period. In 1849, the Anglo population greatly increased in California as a result of the Gold Rush and, in 1850, California was accepted into the Union. As a result of land grants previously established under Mexican leadership that created large pastoral estates in California, as well as a high demand for beef during the

Gold Rush, the state saw a cattle boom from 1849–1855. The increased Anglo population and pursuit of land and gold led to drastic conditions for the remaining indigenous communities, who were once again forced to provide labor or simply killed to make way for new residents. Eventually the beef market collapsed as a result of imported sheep and cattle from New Mexico and the mid-west, and many California ranchers lost their ranchos through foreclosure, once again releasing many Natives from servitude (Beck and Haase 1974; Kroeber 1925).

American Period (1848 to present)
At the same time, both the Federal and State governments promoted military campaigns to eliminate remaining indigenous populations or remove them to Reservations. This included the establishment of multiple reservations of Kumeyaay affiliation, including the establishment of the San Pasqual Reservation in 1910 at the location of the proposed project (San Pasqual Band of Mission Indians). The location of the Reservation was decided after a number of San Pasqual families had filed Indian homestead claims and the Federal government opted to combine the lands in a general Reservation. However, the surveyor responsible for defining the new property misidentified the lands, and the Reservation ended up in the hills above Lake Wohlford, which were too rocky to support a community. As such, relocation to the Reservation took many decades and did not see a robust population until the 1950s (San Pasqual Band of Mission Indians 2024). Though Native populations were greatly diminished in the historic era and many important resources and significant places were destroyed or impacted, the remaining communities have successfully retained their cultural identify and have worked diligently to revitalize cultural practices and remain stewards of their ancestral lands.

METHODS

All efforts made for the completion of this report was completed pursuant to requirements set forth in Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). This study is intended to identify whether any historic resources or archaeological sites are located within the APE, whether any such resources are potentially eligible and therefore considered Historic Properties, and to develop specific recommendations that will address potential adverse effects to those Historic Properties. Tasks completed include:

- A historic resources and archaeological sites records search through the South Coastal Information Center (SCIC) of the APE plus a 1-mile buffer
- A Sacred Lands File (SLF) request through the Native American Heritage Commission (NAHC)
- Information/records request to Indian Health Service and the Band, in case additional data is available beyond records provided by the NAHC and/or the SCIC
- An intensive pedestrian survey via 15-meter transects of the entirety by archaeological field staff and Tribal monitors of the APE
- Recordation of all historic resources and archaeological sites identified utilizing the appropriate CA DPR 523 series forms
- Preliminary evaluations of NRHP eligibility for all resources identified within the APE
- Development of recommendations for resolving potential adverse effects to eligible Historic Properties identified within the APE

RESULTS

Historic and archaeological resources were identified during the research efforts of this study. A historic and archaeological resources records search was conducted through the South Coastal Information Center (SCIC) for the APE plus a 1-mile buffer on January 3, 2024, and produced positive results.

Specifically, the records search results noted 116 cultural resources studies have taken place within 1-mile of the APE, 38 of which including at least a portion of the APE. Additionally, the results noted 115 cultural resources were recorded within 1-mile of the APE, 15 of which overlapped with the APE. Previously recorded resources within the APE include 14 prehistoric archaeological sites and one (1) historic built environment resource. A Sacred Lands File (SLF) search was conducted by the Native American Heritage Commission (NAHC) for the APE and adjacent areas on December 15, 2023, and produced negative results. Soil maps of the APE indicated that the majority of the APE consists of alluvium. Additionally, historic maps of the APE show that the San Luis Rey River ran north/south through the Reservation before it was channelized.

An intensive-level pedestrian field survey of the APE was conducted for the entirety of the APE from January 16 through January 19, 2024, with positive results for the presence of historic resources and archaeological sites. The survey was conducted by walking parallel transects spaced approximately 15 meters apart, carefully examining all surface exposures for evidence of archaeological sites. All fieldwork was overseen by Jamie Nord, MA, RPA and was conducted with support from fellow Kimley-Horn and Associates, Inc. staff Cameron Bauer. The survey was also conducted with one San Pasqual Tribal Monitor present each day: Angelina Gutierrez (January 16), Demetrius Ochoa-Williams (January 17), Jay Morales (January 18), and Darrius Ochoa-Williams (January 19). Ground visibility was fair to good and averaged approximately 50 percent across the APE. The main visibility obstruction of surface soil was the presence of residential paved roads throughout the APE. Ground visibility was excellent away from the paved roads and averaged 80 percent in these areas. Surveyors observed maintained dirt roads, paved residential roads, some dumping and piled debris, several animal burrows, and excessive soil movement via various drainages across the APE created or exacerbated by heavy rains/flooding (Figures 3-5). Some access issues were encountered since the APE includes gated and fenced residential areas. The San Pasqual Tribal Monitors facilitated access when this occurred. During the survey, eight (8) new historic resources and archaeological sites were recorded, which includes four (4) prehistoric isolates, two (2) prehistoric archaeological sites, one (1) multicomponent archaeological site, and one (1) historic built environment resource. Additionally, all 15 previously recorded locations were relocated using the SCIC's GIS data and GPS devices. However, many of these recorded site boundaries only partially or very minimally intersected the APE. As such, no intact archaeological resources were observed at nine (9) previously recorded sites within the intersection of site boundaries and the APE.

The results of the research and fieldwork indicate that the bulk of the APE is highly sensitive for buried and surface archaeological resources. As a result of the above research and field efforts, a total of 23 historic resources and archaeological sites were identified within the APE for the undertaking, including four (4) prehistoric isolates, 16 prehistoric archaeological sites, one (1) multicomponent archaeological site, and two (2) historic built resources (Table 1; Figure 6-7). Furthermore, an additional 100 resources were identified within 1-mile of the APE, the majority of which are prehistoric archaeological resources. While these resources are located outside of the APE and, as such, will not be impacted as a result of the undertaking, their proximity to the APE indicates a broad archaeological sensitivity of the area beyond just the APE and further underlines the archaeological sensitivity of the APE itself.

Figure 3: Overview of a Portion of the Northwestern APE

Figure 4: Overview of a Portion of the Central APE

Figure 5: Proposed Location for the Wastewater Treatment Plant

Table 1: Historic Resources and Archaeological Sites Identified within the APE		
Site Name/Site Number(s)	**Age**	**Description**
CA-SDI-000256	Prehistoric	Campsite with bedrock milling slicks and mortars, pottery, lithics, and a shallow midden deposit
CA-SDI-000257	Prehistoric	Campsite with bedrock milling slicks and mortars, lithic debitage, pottery, and glass
CA-SDI-006703	Prehistoric	Bedrock milling site with lithic scatter
CA-SDI-009915	Prehistoric	Bedrock milling site with lithic scatter (recorded in 2 locations – see map below)
CA-SDI-009916	Prehistoric	Campsite with bedrock milling slicks and mortars, midden soil, fire-affected rock (FAR), lithic debitage, ceramic sherds, and groundstone
CA-SDI-015665	Prehistoric	Bedrock milling site
CA-SDI-015666	Prehistoric	Campsite with bedrock milling features, lithics, sherds, shell, groundstone, FAR, glass, and metal
CA-SDI-015667	Prehistoric	Bedrock milling site with lithic scatter
CA-SDI-015668	Prehistoric	Lithic scatter
CA-SDI-016176	Prehistoric	Bedrock milling site with lithic scatter
CA-SDI-021773	Prehistoric	Bedrock milling site
CA-SDI-023267	Prehistoric	Bedrock milling site with lithic scatter
CA-SDI-023268	Prehistoric	Lithic scatter

CA-SDI-023269	Prehistoric	Lithic scatter
KHA-SPS-24-01	Prehistoric	Quartz flake isolate
KHA-SPS-24-02	Prehistoric	Shell fragment isolate
KHA-SPS-24-03	Prehistoric	Bedrock milling site
KHA-SPS-24-06	Prehistoric	Bedrock milling site
KHA-SPS-24-07	Prehistoric	Shell fragment isolate
KHA-SPS-24-08	Prehistoric	Jasper chopper isolate
KHA-SPS-24-05	Multicomponent	Bedrock milling site with historic nail
P-37-14670/ Escondido Canal	Historic	Earthen canal
KHA-SPS-24-04	Historic	Stone retaining wall structure

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EVALUATIONS

Of the 23 resources identified within the APE, four (4) of the resources are isolated finds and, therefore, do not meet the threshold of an archaeological site that would require evaluation for potential listing in the NRHP. However, the remaining 19 resources do require analysis and consideration as potentially eligible resources. Due to the similarity of recorded resource types across the APE, evaluations were conducted systematically. Below is the site description and evaluation for each resource group or type. Additional information can be found in associated site records located within Appendix C.

CA-SDI-257, SDI-9916, and SDI-15666

These resources are three large, complex prehistoric sites with diverse artifact assemblages and bedrock milling features. Gross and Schultz tested the SDI-257 site in 1996 and recommended the site eligible due to the variety of artifacts and the possibility of human remains. ASM noted in 2021 that the SDI-9916 site may also be eligible under Criteria A and D due to the presence of multiple finished tools with temporally diagnostic characteristics, multiple lithic raw material types, and the reported ceremonial material (e.g., pipe, beads). However, no formal evaluation was conducted at that time. SDI-15666 has not been evaluated.

Resources were observed within the APE during the survey at each site. Specifically, two features and associated artifacts are located within the APE at SDI-257 and indicated long-term, multigenerational use, including potential recent or active use. Additionally, black and red discoloration on the features suggested that the resource may be culturally sensitive. One feature and associated artifacts are located within the APE at SDI-9916. Similar to ASM's notes, a nearby resident reported to the survey crew that ceremonial material was located in the site (e.g., pipes). Six features and seven loci of artifacts were recorded inside the APE at SDI-15666. Artifacts included multiple finished tools with temporally diagnostic characteristics. San Pasqual Tribal Monitors reported that the site is well-known to the community and regularly visited.

The nature of these resources and evidence of recent use or activity indicate that they may be associated with important events, so they are recommended eligible under Criterion A. Research has not indicated that these resources are associated with the lives of important historical figures, and so, they are recommended not eligible under Criterion B. These three sites are not indicative of a distinctive method of construction or the work of a master, and so, they are recommended not eligible under Criterion C. These sites may contain a buried prehistoric component, and as such they may yield information important to the prehistory of the region. Therefore, they are recommended eligible under Criterion D. As such, this study concurs with Gross and Schultz's recommendation of SDI-257 and ASM's preliminary recommendation of SDI-9916 that the resources are eligible for listing on the NRHP under Criterion A and D. Additionally, this study recommends that SDI-15666 is also potentially eligible under Criteria A and D. The setting of these resources has changed over time, but they maintain integrity in location, design, materials, workmanship, feeling, and association. As such, it is recommended that CA-SDI-257, SDI-9916, and SDI-15666 are eligible for listing on the NRHP and are potential Historic Properties under Section 106 of the NHPA.

CA-SDI-256, SDI-6703, SDI-9915, SDI-15667, SDI-16176, SDI-23267, and KHA-SPS-24-05

These campsites or temporary campsites are bedrock milling stations and associated artifact scatters. The original site boundary for SDI-256 was tested by Alter, Gross, and Schultz in 1996 and was recommended not eligible for the southern portion. Though, this original, smaller site boundary is outside of the APE. The other six sites have not previously been evaluated.

Archaeological resources were observed inside the APE at SDI-6703, SDI-15667, and KHA-SPS-24-05. Two bedrock milling features were recorded inside the APE and site boundary of SDI-6703. An isolated granite mano was recorded inside the APE and SDI-15667 site boundary. KHA-SPS-24-05 is a prehistoric bedrock milling station with a historic-period nail and attached clamp cached on the feature.

No archaeological resources were observed at SDI-256, SDI-9915, SDI-16176, or SDI-23267 inside the APE. However, the APE only very minimally intersected SDI-256 and SDI-23267. The other sites, SDI-16176 and -9915, have experienced severe disturbances from the paved residential roads and driveways that intersect them. SDI-9915 has two recorded site boundaries and the field crew surveyed both locations in the APE.

These resources are not associated with important events, and therefore they are recommended not eligible under Criterion A. Research has not indicated that these resources are associated with the lives of important historical figures, and so, they are recommended not eligible under Criterion B. These seven sites are not indicative of a distinctive method of construction or the work of a master, and so, they are recommended not eligible under Criterion C. These resources are well-documented resource types, and thus, they are unlikely to yield new important information about the prehistory of the region. Therefore, they are also recommended not eligible under Criterion D. Therefore, they are not recommended potentially eligible for the National Register and are not recommended a potential Historic Property under Section 106 of the NHPA. However, since most of the site boundaries for SDI-256 and SDI-23267 are located outside the APE, this evaluation and recommendation is only specific to the portions of SDI-256 and SDI-23267 that are actually located inside the APE. The evaluations for the other sites (SDI-6703, SDI-9915, SDI-15667, SDI-16176, and KHA-SPS-24-05) refer to the sites in their entirety.

CA-SDI-15665, SDI-21773, KHA-SPS-24-03, and SPS-24-06

These four prehistoric resources are bedrock milling sites. No resources associated with SDI-15665 were identified within the APE, but a small area was outside the APE and not surveyed. The surveyed area inside the site boundary has been entirely graded from the road development and is presumed destroyed. Bedrock milling stations were identified during the survey at the other three sites.

These resources are not associated with important events, and therefore they are recommended not eligible under Criterion A. Research has not indicated that these resources are associated with the lives of important historical figures, and so, they are recommended not eligible under Criterion B. The sites are not indicative of a distinctive method of construction or the work of a master, and so, they are recommended not eligible under Criterion C. These resources are well-documented resource types, and thus, they are unlikely to yield new important information about the prehistory of the region. Therefore, they are also recommended not eligible under Criterion D. Therefore, they are not recommended potentially eligible for the National Register and are not recommended a potential Historic Property under Section 106 of the NHPA.

CA-SDI-15668, SDI-23268, and SDI-23269

These three prehistoric resources are lithic scatters. No resources associated with the sites were observed inside the APE. However, each site only partially intersects the APE, and therefore only portions of the site boundaries were surveyed.

These resources are not associated with important events, and therefore they are recommended not eligible under Criterion A. Research has not indicated that these resources are associated with the lives of important historical figures, and so, they are recommended not eligible under Criterion B. The sites are not indicative of a distinctive method of construction or the work of a master, and so, they are recommended not eligible under Criterion C. These resources are well-documented resource types, and thus, they are unlikely to yield new important information about the prehistory of the region. Therefore, they are also recommended not eligible under Criterion D. Therefore, they are not recommended potentially eligible for the National Register and are not recommended a potential Historic Property under Section 106 of the NHPA. However, since much of the recorded site areas are located outside the APE, this evaluation and recommendation is only specific to the portions inside the APE.

P-37-14670

P-37-14670 (Escondido Canal) is a historic built environment resource that has previously been evaluated in segments. ASM noted that the entirety of the Escondido Canal may be eligible for listing on the National Register of Historic Places under Criterion A for the development of small irrigation districts in the American West in the late 19th/ early 20th century. However, the structure has been modernized throughout its length and is lacking integrity. Therefore, ASM recommended that the 2-mile portion of the Escondido Canal they reviewed was not eligible for listing under Criteria A-D. In 2013, PAR recommended the canal eligible under Criteria A, C, and D and noted that portions retained integrity. The canal is also a contributing element of the Escondido Irrigation District historic district. PAR did not distinguish between contributing and noncontributing segments of the canal in their 2013 update. ICF revisited six segments of the canal in 2015 and noted the visited segments were modernized as described by ASM. Kimley-Horn field crew surveyed eight segments of the canal that intersected the APE for this study. The field crew observed that each segment was modernized as previously described.

The canal may be associated with important events, such as early irrigation of region, and therefore is recommended eligible under Criterion A. Research has not indicated that the canal is associated with an important person, and therefore it is recommended not eligible under Criterion B. The canal embodies a distinctive method of construction, and therefore, it is recommended under Criterion C. Additionally, the resource has the potential to yield information about the history of the region, so it is also recommended eligible under Criterion D. Similar to previous segmented evaluations, this study recommends that the eight segments of P-37-14670 meet Criteria A, C, and D. However, the resource has been destroyed by modernization efforts and development, and as such, it lacks integrity in its design, setting, materials, workmanship, and feeling. Therefore, the eight segments are not recommended potentially eligible for the National Register and are not recommended a potential Historic Property under Section 106 of the NHPA.

KHA-SPS-24-04

KHA-SPS-24-04 is the remains of a stone retaining wall located adjacent to a central segment of the Escondido Canal. The retaining wall is associated with a house that was originally located on site but later demolished. The resource is dilapidated and structurally unstable. KHA-SPS-24-04 is not associated with any important events in the region. Therefore, it is recommended not eligible under Criterion A. The resource is not associated with the lives of persons significant to the past, so it is recommended not eligible under Criterion B. The resource does not embody any distinctive characteristics or the work of a master, so it is recommended not eligible under Criterion C. Finally, it is unlikely to yield information important to history, and therefore is recommended not eligible under Criterion D. Therefore, the resource is not recommended potentially eligible for the National Register and is not recommended a potential Historic Property under Section 106 of the NHPA.

RECOMMENDATIONS

Out of the 23 historic resources and archaeological sites identified within the APE, three (3) resources (CA-SDI-257, SDI-9916, and SDI-15666) exhibit the qualities required for eligibility for listing in the National Register of Historic Places (NRHP) and therefore were identified as potential Historic Properties (Figure 8). The other 20 resources were not identified as eligible for listing in the National Register of Historic Places nor as Historic Properties under Section 106 of the NHPA. Various uses of the area (i.e., residential development) and exposures to heavy rain/flooding have greatly impacted the physical integrity of historic and archaeological resources recorded on site. Due to the presence of three (3) potential Historic Properties within the APE, this study recommends the following:

- Preservation in place is the preferred manner of treatment for archaeological resources. If preservation is not feasible then a data recovery plan, which provides for adequately recovering scientifically consequential information from and about the Historic Property, shall be prepared for CA-SDI-257, SDI-9916, and SDI-15666 and adopted prior to any undertaking or project-related excavation.

- An appropriate avoidance, minimization and mitigation plan shall be created, implemented and complied with during construction of the project.

- Prior to Project implementation, a Project Archaeologist meeting the Secretary of Interior's professional qualification standards in archaeology and a San Pasqual Tribal Monitor will conduct an archaeological sensitivity training for all on-site personnel related to resources for the Project. The training will provide an overview of known archaeological resources, as well as information related to archaeological resources that may be identified during project implementation, how to identify them, and the process to follow in the case of discovery. All personnel that access the site must undergo this training.

- A qualified archaeological resources monitor and/or San Pasqual Tribal Monitor shall be present during all ground-disturbing activities, including any grubbing or minor site preparation efforts that would impact surface cultural resources, throughout the duration of Project construction. The monitor would coordinate with the Project Archaeologist, who will serve as the Principal Investigator for the Project.

As such, with these recommendations implemented, the undertaking is unlikely to result in an adverse effect to Historic Properties and, as such, it is recommended that the undertaking be provided a finding of "Historic Properties Present – No Adverse Effect".

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Appendix A:

Native American Heritage Commission (NAHC) Sacred Lands File (SLF) Search Results

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

NATIVE AMERICAN HERITAGE COMMISSION

December 15, 2023

Jamie Nord
Kimley-Horn

***Via Email to*: Jamie.nord@kimley-horn.com**

Re: San Pasqual Sewer Project, San Diego County

Dear Ms. Nord:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

Appendix B:

South Coastal Information Center (SCIC) Record Search Results

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-00300	NADB-R - 1120300; Voided - BULL 04	1974	Bull, Charles and Paul H. Ezell	An Archaeological Survey for the Escondido Mutual Water Company Relocated Water Line.	San Diego State University	
SD-01284	NADB-R - 1121284; Voided - NAPTON 13	1984	Napton, L. Kyle and E. A. Greathouse	Cultural Resource Investigations, San Pasqual Indian Reservation, California.	American Indian Resource Organization, Inc.	37-000256, 37-000257, 37-000670, 37-009916
SD-01788	NADB-R - 1121788; Voided - SCHROTH 04	1986	Schroth, Adella B. and Philip J. Wilke	Environmental Impact Evaluation: An Archaeological Assessment of 29 Half-Acre Parcel and One 3.5 Acre Parcel of Land Located on the San Pasqual Indian Reservation, Northern San Diego Coutny, California	University of California at Riverside	37-009916
SD-02080	NADB-R - 1122080; Voided - COUNTYSD26	1989	County of San Diego Department of Planning & Land Use	Draft Supplimental Environmental Impact Report Santa Ysabel Rezone 89-001	County of San Diego	
SD-02973	NADB-R - 1122973; Voided - ROYBAL 01	1995	ROYBAL, GERALD J.	RECONNAISSANCE SURVEY FOR THE SAN PASQUAL INDIAN RESERVATION PROPOSED ROAD SURFACING AND CONSTRUCTION.	ROYBAL & ASSOCIATES	37-000256, 37-000257, 37-000258
SD-03251	NADB-R - 1123251; Voided - JENSEN 01	1996	JENSEN, PETER and SEAN JENSEN	ARCHAEOLOGICAL INVENTORY SURVEY: REPLACEMENT OF TWO WOODEN FLUMES ALONG THEESCONDIDO CANAL, WOODS VALLEY AT SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	JENSEN AND ASSOCIATES	37-009916, 37-014670
SD-05020	NADB-R - 1125020; Voided - COUNTYSD43	1983	County of San Diego	Cultural Resource Assessment of Bureau of Land Management Valley Center Site 1	County SD	
SD-05307	NADB-R - 1125307; Other - AFFINIS JOB NO. 1149; Voided - ALTER64	1996	ALTER, RUTH and RICHARD D. SHULTZ	ARCHAEOLOGICAL TESTING OF CULTURAL RESOURCES FOR SAN PASQUAL ROAD IMPROVEMENT PROJECT SAN PASQUAL INDIAN RESERVATION VALLEY CENTER, CALIFORNIA (ARPA PERMIT BIA/SAO-96-01-J54[589])	VISIONS ENTERPRISES	37-000256, 37-000257, 37-000258
SD-05426	NADB-R - 1125426; Voided - PIGNIOL104	2000	PIGNIOLO, ANDREW and MICHAEL BAKSH	Cultural Resource Survey Report for the San Pasqual Firebreaks Project, San Pasqual Indian Reservation, California	Tierra Environmental Services	37-000670, 37-017288, 37-018318, 37-018319, 37-018320, 37-018324, 37-028203
SD-05433	NADB-R - 1125433; Voided - PIGNIOL109	2000	PIGNIOLO, ANDREW	Cultural Resources Survey Report for the Districts A&B Water System Rehabilitation Project, San Pasqual Indian Reservation, San Diego, California	Tierra Environmental Services	37-000256, 37-000257, 37-006703, 37-009916, 37-018786, 37-018787, 37-018788, 37-018789, 37-018790

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-05496	NADB-R - 1125496; Voided - ROYBAL2	1995	ROYBAL, GERALD J.	Reconnaissance Survey for the San Pasqual Indian Reservation Proposed Road Surfacing and Construction	Gerald J. Roybal	37-000256, 37-000257, 37-000258, 37-000277, 37-005511, 37-006703, 37-006704, 37-007965, 37-009915, 37-009916, 37-011513, 37-011514
SD-06450	NADB-R - 1126450; Voided - JENSON 03	1996	JENSON, PETER	ARCHAEOLOGICAL INVENTORY SURVEY: REPLACEMENT OF 2 WOODEN FLUMES ALONG THE ESCONDIDO CANAL, WOODS VALLEY AT SAN PASQUAL INDIAN RESERVATION	PETER JENSEN	
SD-06771	NADB-R - 1126771; Voided - NAPTON18	1984	NAPTON, KYLE	CULTURAL RESOURCE INVESTIGATIONS FOR SAN PASQUAL INDIAN RESERVATION, CALIFORNIA	AMERICAN INDIAN RESOURCE ORG.	
SD-06972	NADB-R - 1126972; Voided - JENSON 02	1995	JENSON, PETER	REQUESTING REVIEW & CONCURRENCE WITH FINDINGS, ARCHAEOLOGY INVENTORY SURVEY, ESCONDIDO CANAL	PETER JENSON	
SD-07418	NADB-R - 1127418; Voided - PIGNIO 125	2001	PIGNIOLO, ANDREW, DUSTIN KAY, and STEPHANIE MURRAY	CULTURAL RESOURCES SURVEY REPORT FOR THE SAN PASQUAL RESIDENTIAL FIREBREAKS PROJECT, SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	TIERRA	
SD-08728	NADB-R - 1128728; Voided - MSA 21	1979	PATTERSON, CAMERON C. and MARINA RILEY BRAND	BIOLOGY/ARCHAEOLOGY TECHNICAL REPORTS FOR INDIAN HILLS, LTD.	MSA	
SD-09299	NADB-R - 1129299; Voided - KYLE 275	2004	Kyle, Carolyn	Cultural Resource Assessment for Cingular Wireless Facility SD-733-04 27434 South Canal Rd. City of Valley Center San Diego County	Kyle, Carolyn	
SD-09469	NADB-R - 1129469; Voided - GROSS82	1989	Gross, Timothy and Mary Robbins-Wade	Cultural Resources Survey and Significance Assessment: Ridge Ranch, Valley Center, California	Affinis Environmental Services	
SD-11939	NADB-R - 1131939; Voided - HECTOR207	2008	HECTOR, SUSAN and LINDA AKYUZ	MANAGEMENT PLAN FOR ARCHAEOLOGICAL RESOURCES WITHIN THE HELLHOLE CANYON PRESERVE, SAN DIEGO COUNTY	ASM AFFILIATES	
SD-11983	NADB-R - 1131983; Voided - MCGINNIS93	2008	MCGINNIS, PATRICK	CULTURAL RESOURCES REPORT FOR THE SAN PASQUAL RESERVATION WATER SYSTEM EXTENSION	TIERRA ENVIRONMENTAL SERVICES	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-14343	NADB-R - 1134343; Voided - WILSONS59	2013	WILSON, STACIE	LETTER REPORT: ETS 25416- CULTURAL RESOURCES SURVEY FOR ONE POLE INSTALLATION, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA- IO 7011102	AECOM	
SD-14705	NADB-R - 1134705; Voided - HDR01	2013	HDR ENGINEERING, INC.	HISTORIC PROPERTIES TREATMENT PLAN ESCONDIDO HYDROELECTRIC PROJECT SAN DIEGO COUNTY, CALIFORNIA	HDR ENGINEERING, INC.	
SD-14841	NADB-R - 1134841; Voided - NEWCOM02	2013	NEWCOMB, S. JOSHUA	SECTION 106 CONSULTATION FOR THE DRILL TEST WELL DEVELOPMENT OF COMMUNITY DRINKING WATER SUPPLY- SAN PASQUAL INDIAN RESERVATION	INDIAN HEALTH SERVICE	37-014670, 37-033418, 37-033419
SD-15754	NADB-R - 1135754	2015	Carrie Wills and Sarah Williams	CULTURAL RESOURCE RECORDS SEARCH RESULTS FOR CELLCO PARTNERSHIP AND THEIR CONTROLLED AFFILIATES DOING BUSINESS AS VERIZON WIRELESS CANDIDATE 881458 VALLEY VIEW, SOUTH CANAL ROAD, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA	First Carbon Solutions	
SD-15939	NADB-R - 1135939	2014	Cindy L. Baker	NATIONAL REGISTER EVALUATION OF HISTORIC BUILT RESOURCES INCLUDED IN THE LICENSE SURRENDER OF THE ESCONDIDO PROJECT (FERC #176), SAN DIEGO COUNTY, CALIFORNIA	PAR Environmental Services, INC	
SD-16206	NADB-R - 1136206	2016		ESCONDIDO CANAL HISTORIC DISTRICT, SAN LUIS REY RIVER, ESCONDIDO	HDR ENGINEERING, INC.	
SD-16689	NADB-R - 1136689	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30028 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION F RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16697	NADB-R - 1136697	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30025 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION C RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-16701	NADB-R - 1136701	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30042 - CULTURAL RESOURCES SURVEY REPORT FOR THE FIRM C1030 RECONDUCTOR SECTION T PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF International	
SD-16703	NADB-R - 1136703	2015	COX, NARA and CHMIEL, KAROLINA	ETS 30026 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION D RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16709	NADB-R - 1136709	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30027 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION E RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16884	NADB-R - 1136884	2016	PENTNEY, SANDRA P.	CULTURAL RESOURCES LETTER REPORT FOR THE SAN PASQUAL UNDERGROUNDING PROJECY, SAN DIEGO COUNTY, CALIFORNIA	ATKINS	
SD-16885	NADB-R - 1136885; Submitter - 17350	2012	GUNDERMAN, SHELBY, STRINGER-BOWSHER, SARAH, and HALE, MICAH	CULTURAL AND HISTORICAL RESOURCES SURVEY AND EVALUATION REPORT FOR THE SAN LUIS REY INDIAN WATER RIGHTS SETTLEMENT AGREEMENT, ESCONDIDO CANAL UNDERGROUNDING, SAN DIEGO COUNTY, CALIFORNIA	ASM Affiliates, Inc	
SD-17003	NADB-R - 1137003	2016	COX, NARA	LETTER REPORT: ETS 30042 - CULTURAL RESOURCES MONITORING FOR FIRM C1030 SECTION T, POLE P167987, SAN PASQUAL, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF International	37-033820
SD-17536	NADB-R - 1137536	2017	COX, NARA	LETTER REPORT: ETS 30025 - CULTURAL RESOURCES MONITORING FOR FIRM C1030 SECTION C, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-18256	NADB-R - 1138256; Other - D170240.08, TASK 1	2019	BEVER, MICHAEL R., MICHAEL VADER, MATTHEW GONZALES, and GARCIA KELLAR	CULTURAL RESOURCES SURVEY AND INVENTORY FOR THE HELLHOLE CANYON PRESERVE ADDITIONS, COUNTY OF SAN DIEGO, CALIFORNIA	ENVIRONMENTAL SCIENCE ASSOCIATES	37-011900, 37-011902, 37-011903, 37-011904, 37-011905, 37-011906, 37-011907, 37-013341, 37-013393, 37-013397, 37-026394, 37-026395, 37-026396, 37-026397, 37-026398, 37-038737, 37-038738, 37-038739, 37-038740, 37-038741, 37-038742, 37-038743, 37-038744, 37-038745, 37-038746
SD-18268	NADB-R - 1138268; OHP PRN - BIA_2018_0320_001	2018	HALL, DAN	ARCHAEOLOGICAL SURVEY OF SEVEN PROPOSED HOMESITE LEASE AREAS ON THE SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	BUREAU OF INDIAN AFFAIRS	
SD-20176	NADB-R - 1140176	2021	JORDAN, AMY	ARCHAEOLOGICAL SURVEY FOR THE C1030 STRATEGIC UNDERGROUNDING PROJECT, PHASE 3A, SANTEE LANE, SAN DIEGO COUNTY, CALIFORNIA (SDG&E ETS #49345, ASM PROJECT #37001.04)	ASM AFFILIATES	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-00055	NADB-R - 1120055; Voided - ADAMS 05	1979	Adams, Therese E.	A Cultural Resource Survey Report For Paradise Mountain Avacado Ranch	Recon	
SD-00063	NADB-R - 1120063; Voided - APEC 05	1980	American Pacific Environmental Consultants, Inc.	Archaeological Study for Bamber Property	American Pacific Environmental Consultants, Inc.	37-007965
SD-00072	NADB-R - 1120072; Voided - APEC 03	1979	American Pacific Environmental Consultants Inc.	Archaeological Investigation on Choumas Lot Split Valley Center, California	American Pacific Environmental Consultants, Inc.	37-006860, 37-006861, 37-006862
SD-00120	NADB-R - 1120120; Voided - BAKSH 01	1974	Baksh, Mike	Archaeological Surveys of the Sycuan, Barona, Santa Ysabel and Los Coyotes Indian Reservations.	Dr. Paul H. Ezell	
SD-00121	NADB-R - 1120121; Voided - BANKS 1	1980	Banks, Thomas J.	Archaeological Survey Surface Collection and Test Excavation at Site W-2586 Near Woods Valley, San Diego County. TPM 16471	Have Mule Will Travel	
SD-00133	NADB-R - 1120133; Voided - BERRYS 32	1975	Berryman, Stanley R.	Archaelogical Investigation of: Ernest Thomas Lot Split TPM 11061.	Berryman Archaeological Consultants	37-001065, 37-001066
SD-00300	NADB-R - 1120300; Voided - BULL 04	1974	Bull, Charles and Paul H. Ezell	An Archaeological Survey for the Escondido Mutual Water Company Relocated Water Line.	San Diego State University	
SD-00504	NADB-R - 1120504; Voided - CHACE 31	1978	Chace, Paul G.	An Archaeological Survey of the Benson Property Near Valley Center County of San Diego T.P.M. #14385 (EQD No. 98-9-14)	Paul G. Chace & Associates	37-005489
SD-00593	NADB-R - 1120593; Voided - CHACE 84	1984	Chace, Paul G.	A Cultural Resources Survey for the Central Valley Center Sewer SWCB Project No. C-06-1567.	Paul G. Chace	37-000290, 37-000788, 37-004556, 37-004560, 37-004806, 37-005070, 37-005071, 37-005072
SD-00765	NADB-R - 1120765; Voided - CHACE 95	1987	Chace, Paul G. and Donna Collins	1987 Addendum, A Cultural Resources Survey for the Central Valley Center Sewer	Paul G. Chace & Associates	37-004672, 37-010558, 37-010891, 37-010892
SD-01146	NADB-R - 1121146; Voided - LEEPER 01	1989	Leeper, Karlene	Live Oak Ranch Historical Background.	Affinis	37-011565, 37-011566, 37-011567, 37-011568
SD-01284	NADB-R - 1121284; Voided - NAPTON 13	1984	Napton, L. Kyle and E. A. Greathouse	Cultural Resource Investigations, San Pasqual Indian Reservation, California.	American Indian Resource Organization, Inc.	37-000256, 37-000257, 37-000670, 37-009916
SD-01396	NADB-R - 1121396; Voided - ENVIRONME1	1981	Environmental Horizons	Biological and Archaeological Survey of the Lantis Property San Diego County TPM #16956	Archaeological Consulting and Technology	
SD-01516	NADB-R - 1121516; Voided - VANHORN 11	1978	Van Horn, David M.	Archaeological Survey Baker Lot Split, Valley Center	Archaeological Associates	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-01566	NADB-R - 1121566; Voided - SMITH, D.3	1973	Smith, David D. and Associates	Report on the Archaeological Resources of the Paradise Mountain Estates Development Site San Diego, California	David D. Smith and Associates	
SD-01788	NADB-R - 1121788; Voided - SCHROTH 04	1986	Schroth, Adella B. and Philip J. Wilke	Environmental Impact Evaluation: An Archaeological Assessment of 29 Half-Acre Parcel and One 3.5 Acre Parcel of Land Located on the San Pasqual Indian Reservation, Northern San Diego Coutny, California	University of California at Riverside	37-009916
SD-01827	NADB-R - 1121827; Voided - MOONEY 05	1989	Mooney, Brian Farrell, M. Steven Shackley, and Carol Serr	Jon Wilkie Property	Brian F. Mooney Associates	37-011513, 37-011514
SD-01925	NADB-R - 1121925; Voided - HANNA 04	1977	Hanna, David Jr.	An Archaeological Reconnaissance Near Valley Center San Diego County, California	Archaeological Systems Management	37-000290
SD-01994	NADB-R - 1121994; Voided - COOK, J.28	1989	Cook, John R.	Cultural Resource Survey Los Hermanos Between Conchita Road and Kiavo Road	ASM Affiliates, Inc.	
SD-02080	NADB-R - 1122080; Voided - COUNTYSD26	1989	County of San Diego Department of Planning & Land Use	Draft Supplimental Environmental Impact Report Santa Ysabel Rezone 89-001	County of San Diego	
SD-02973	NADB-R - 1122973; Voided - ROYBAL 01	1995	ROYBAL, GERALD J.	RECONNAISSANCE SURVEY FOR THE SAN PASQUAL INDIAN RESERVATION PROPOSED ROAD SURFACING AND CONSTRUCTION.	ROYBAL & ASSOCIATES	37-000256, 37-000257, 37-000258
SD-03251	NADB-R - 1123251; Voided - JENSEN 01	1996	JENSEN, PETER and SEAN JENSEN	ARCHAEOLOGICAL INVENTORY SURVEY: REPLACEMENT OF TWO WOODEN FLUMES ALONG THEESCONDIDO CANAL, WOODS VALLEY AT SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	JENSEN AND ASSOCIATES	37-009916, 37-014670
SD-04156	NADB-R - 1124156; Voided - WADE 35	1990	Sue Wade	An Archaeological Testing Program for Twelve Sites Within the Woods Valley Ranch Project Area Valley Center, California	Recon	37-000295, 37-005524, 37-005526, 37-005528, 37-005532, 37-005537, 37-005538, 37-005539, 37-005540, 37-011268, 37-011269
SD-04220	NADB-R - 1124220; Voided - APEC24	1979	APEC	ARCHAEOLOGICAL INVESTIGATION OF THE CHOUMAS LOS SPLIT VALLEY CENTER, CALIFORNIA	APEC	
SD-04446	NADB-R - 1124446; Voided - SERR02	1992	SERR, CAROL	APPENDIX B: ARCHAEOLOGICAL INVESTIGATION OF WOODS VALLEY CENTER, CALIFORNIA	BRIAN MOONEY ASSOCIATES	

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SD-05020	NADB-R - 1125020; Voided - COUNTYSD43	1983	County of San Diego	Cultural Resource Assessment of Bureau of Land Management Valley Center Site 1	County SD	
SD-05056	NADB-R - 1125056; Voided - KYLE108	2001	KYLE, CAROLYN	CULTURAL RESOURCE SURVEY FOR THE EHMCKE PROJECT, COUNTY OF SAN DIEGO, CALIFORNIA	KYLE CONSULTING	37-001065, 37-001067, 37-001966, 37-013398, 37-013437
SD-05307	NADB-R - 1125307; Other - AFFINIS JOB NO. 1149; Voided - ALTER64	1996	ALTER, RUTH and RICHARD D. SHULTZ	ARCHAEOLOGICAL TESTING OF CULTURAL RESOURCES FOR SAN PASQUAL ROAD IMPROVEMENT PROJECT SAN PASQUAL INDIAN RESERVATION VALLEY CENTER, CALIFORNIA (ARPA PERMIT BIA/SAO-96-01-J54[589])	VISIONS ENTERPRISES	37-000256, 37-000257, 37-000258
SD-05426	NADB-R - 1125426; Voided - PIGNIOL104	2000	PIGNIOLO, ANDREW and MICHAEL BAKSH	Cultural Resource Survey Report for the San Pasqual Firebreaks Project, San Pasqual Indian Reservation, California	Tierra Environmental Services	37-000670, 37-017288, 37-018318, 37-018319, 37-018320, 37-018324, 37-028203
SD-05433	NADB-R - 1125433; Voided - PIGNIOL109	2000	PIGNIOLO, ANDREW	Cultural Resources Survey Report for the Districts A&B Water System Rehabilitation Project, San Pasqual Indian Reservation, San Diego, California	Tierra Environmental Services	37-000256, 37-000257, 37-006703, 37-009916, 37-018786, 37-018787, 37-018788, 37-018789, 37-018790
SD-05496	NADB-R - 1125496; Voided - ROYBAL2	1995	ROYBAL, GERALD J.	Reconnaissance Survey for the San Pasqual Indian Reservation Proposed Road Surfacing and Construction	Gerald J. Roybal	37-000256, 37-000257, 37-000258, 37-000277, 37-005511, 37-006703, 37-006704, 37-007965, 37-009915, 37-009916, 37-011513, 37-011514
SD-05628	NADB-R - 1125628; Other - Arcaheos Job # 730; Voided - ALTER69	2000	ALTER, RUTH	Results of the Historic Building Assessment for 7740-42 and 7746-48 Eads Avenue, La Jolla, California	Dale and Edith Sundby	37-018951
SD-06305	NADB-R - 1126305; Other - BFMA-005-572; Voided - CASE 22	2000	CASE, ROBERT	CULTURAL RESOURCE SURVEY OF THE 82 ACRE BLACKWELL PROPERTY (TPM-20495) NEAR VALLEY CENTER SAN DIEGO CALIFORNIA	MOONEY & ASSOC.	37-000256, 37-000257, 37-000277, 37-000666, 37-000670, 37-005511, 37-007965, 37-009685, 37-009915, 37-011134, 37-014670, 37-018318, 37-018319, 37-018789, 37-018790
SD-06450	NADB-R - 1126450; Voided - JENSON 03	1996	JENSON, PETER	ARCHAEOLOGICAL INVENTORY SURVEY: REPLACEMENT OF 2 WOODEN FLUMES ALONG THE ESCONDIDO CANAL, WOODS VALLEY AT SAN PASQUAL INDIAN RESERVATION	PETER JENSEN	
SD-06771	NADB-R - 1126771; Voided - NAPTON18	1984	NAPTON, KYLE	CULTURAL RESOURCE INVESTIGATIONS FOR SAN PASQUAL INDIAN RESERVATION, CALIFORNIA	AMERICAN INDIAN RESOURCE ORG.	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-06972	NADB-R - 1126972; Voided - JENSON 02	1995	JENSON, PETER	REQUESTING REVIEW & CONCURRENCE WITH FINDINGS, ARCHAEOLOGY INVENTORY SURVEY, ESCONDIDO CANAL	PETER JENSON	
SD-07418	NADB-R - 1127418; Voided - PIGNIO 125	2001	PIGNIOLO, ANDREW, DUSTIN KAY, and STEPHANIE MURRAY	CULTURAL RESOURCES SURVEY REPORT FOR THE SAN PASQUAL RESIDENTIAL FIREBREAKS PROJECT, SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	TIERRA	
SD-08114	NADB-R - 1128114; Voided - DUKE229	2002	DUKE, CURT	CULTURAL RESOURCE ASSESSMENT CINGULAR WIRELESS FACILITY NO. SD 959-03, SAN DIEGO COUNTY, CA	LSA ASSOCIATES	
SD-08155	NADB-R - 1128155; Voided - COUNTYSD37	2003	GAIL WRIGHT	NEGATIVE CULTURAL RESOURCES SURVEY REPORT FOR TPM 20697, LOG NO. 02-09-017 FARRAR TENTATIVE PARCEL MAP APN 189-180-36-00	COUNTY OF SAN DIEGO	
SD-08329	NADB-R - 1128329; Voided - MASON14	2002	MASON, ROGER D.	CULTURAL RESOURCES RECORDS SEARCH AND FIELD SURVEY REPORT FOR A VERIZON TELECOMMUNICATIONS FACILITY: RANCHO SANTA TERESA, IN THE CITY OF RAMONA, SAN DIEGO COUNTY, CALIFORNIA	CHAMBERS GROUP, INC.	
SD-08555	NADB-R - 1128555; Voided - ECKHARDT20	2003	ECKHARDT, WILLAIM T.	COMPLETION OF SITE PRESERVATION CAPPING AND CONSTRUCTION DEVELOPMENT MONITORING PROGRAM FOR WOODS VALLEY RANCH DEVELOPMENT (SP91-004, TM5004,P91-38)	WILLIAM T. ECKHARDT	37-000290, 37-000295, 37-005524, 37-005525, 37-005526, 37-005527, 37-005528, 37-005530, 37-005531, 37-005532, 37-005537, 37-005538, 37-005539, 37-005540, 37-005541, 37-005811, 37-011268, 37-011269, 37-012206, 37-024567, 37-024568, 37-024569
SD-08725	NADB-R - 1128725; Voided - COOK 87	1993	COOK, JOHN R.	ACHAEOLOGICAL SURVEY REPORT FOR THE RICHARDSON PROPERTY IN VALLEY CENTER, CA	BRIAN F. MOONEY ASSOCIATES	
SD-08726	NADB-R - 1128726; Voided - HATLEY 12	1978	HATLEY, JAY M. and CHARLES S. BULL	A CULTURAL RESOURCE INVENTORY AND IMPACT ANALYSIS FOR KELLY/BULL PROPERTY	RECON	
SD-08728	NADB-R - 1128728; Voided - MSA 21	1979	PATTERSON, CAMERON C. and MARINA RILEY BRAND	BIOLOGY/ARCHAEOLOGY TECHNICAL REPORTS FOR INDIAN HILLS, LTD.	MSA	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-08830	NADB-R - 1128830; Voided - KYLE186	2001	KYLE, CAROLYN E.	CULTURAL RESOURCE TEST FOR SITES CA-SDI-1066, CA-SDI-1067, CA-SDI-13398, AND CA-SDI-13437. EHMCKE PROJECT, COUNTY OF SAN DIEGO, CALIFORNIA	KYLE CONSULTING	37-001066, 37-001067, 37-013398, 37-013437
SD-08831	NADB-R - 1128831; Voided - KYLE185	2001	KYLE, CAROLYN E.	CULTURAL RESOURCE SURVEY FOR THE EHMCKE PROJECT, COUNTY OF SAN DIEGO, CALIFORNIA	KYLE CONSULTING	37-001065, 37-001066, 37-001067, 37-005975, 37-013398, 37-013437
SD-08894	NADB-R - 1128894; Voided - KYLE197	2001	KYLE, CAROLYN	CULTURAL RESOURCE SURVEY FOR THE EHMCKE PROJECT, COUNTY OF SAN DIEGO, CALIFORNIA	KYLE CONSULTING	37-001065, 37-001066, 37-001067, 37-013398, 37-013437
SD-08991	NADB-R - 1128991; Voided - MCGINNIS19	2004	MC GINNIS, PATRICK	CULTURAL RESOURCES SURVEY REPORT FOR THE SAN PASQUAL 3.5-ACRE FEE-TO-TRUST PROJECT, SAN DIEGO COUNTY, CALIFORNIA	TIERRA ENVIRONMENTAL SERVICES	
SD-09153	NADB-R - 1129153; Voided - MCGINNIS25	2004	MCGINNIS, PATRICK and MICHAEL BAKSH	CULTURAL RESOURCES SURVEY REPORT FOR THE SAN PASQUAL 3.31 ARCE FEE-TO-TRUST PROJECT SAN DIEGO COUNTY, CALIFORNIA	TIERRA ENVIRONMENTAL SERVICES	
SD-09299	NADB-R - 1129299; Voided - KYLE 275	2004	Kyle, Carolyn	Cultural Resource Assessment for Cingular Wireless Facility SD-733-04 27434 South Canal Rd. City of Valley Center San Diego County	Kyle, Carolyn	
SD-09391	NADB-R - 1129391; Voided - WRIGHT81	2005	WRIGHT, GAIL	CULTURAL RESOURCES SURVEY REPORT FOR TPM 20917, LOG 05-09-005 BROWN'S RANCHO MINOR SUBDIVISION APN 189-030-38	COUNTY OF SAN DIEGO, DEP. OF PLANNING & LAND USE	
SD-09469	NADB-R - 1129469; Voided - GROSS82	1989	Gross, Timothy and Mary Robbins-Wade	Cultural Resources Survey and Significance Assessment: Ridge Ranch, Valley Center, California	Affinis Environmental Services	
SD-09483	NADB-R - 1129483; Voided - GROSS85	1989	Gross, Timothy and Mary Robbins-Wade	Cultural Resources Survey and Significance Assessment: Live Oak Ranch, Valley Center, California	Affinis Environmental Services	
SD-09832	NADB-R - 1129832; Voided - BERRYS 92	1981	Berryman, Stanley	Report of a Biological Survey of the Costa and Lantis Properties Guejito/Biological Survey and Archaeolgical Report for Costa Property TM 17019	Pacific Southwest Biological Services, Inc.	
SD-11575	NADB-R - 1131575; Voided - COOKJ120	1989	COOK, JOHN R.	HELLHOLE LETTER REPORT	ASM AFFILIATES, INC.	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-11939	NADB-R - 1131939; Voided - HECTOR207	2008	HECTOR, SUSAN and LINDA AKYUZ	MANAGEMENT PLAN FOR ARCHAEOLOGICAL RESOURCES WITHIN THE HELLHOLE CANYON PRESERVE, SAN DIEGO COUNTY	ASM AFFILIATES	
SD-11983	NADB-R - 1131983; Voided - MCGINNIS93	2008	MCGINNIS, PATRICK	CULTURAL RESOURCES REPORT FOR THE SAN PASQUAL RESERVATION WATER SYSTEM EXTENSION	TIERRA ENVIRONMENTAL SERVICES	
SD-11985	NADB-R - 1131985; Voided - TIERRA13	2005	TIERRA ENVIRONMENTAL SERVICES	PHASE I - ENVIRONMENTAL SITE ASSESSMENT FOR A 3.75-ACRE PARCEL LAKE WOHLFORD ROAD VALLEY CENTER, CALIFORNIA	TIERRA ENVIRONMENTAL SERVICES	
SD-12309	NADB-R - 1132309; Voided - COOLEY38	2005	COOLEY, THEODORE	LETTER REPORT FOR CULTURAL RESOURCE SURVEY FOR THE SAN PASQUAL PARKING LOT NEAR VALLEY CENTER	MOONEY JONES & STOKES	
SD-13723	NADB-R - 1133723; Voided - ROSENBE83	2009	ROSENBERG, SETH A.	ETS #8147; CULTURAL RESOURCES SURVEY FOR THE REPLACEMENT OF FOUR WOOD POLES (P116494, P112248, P13581, AND P135582) IN VALLEY CENTER, SAN DIEGO COUNTY	E2M	
SD-13759	NADB-R - 1133759; Voided - BOWDEN55	2011	BOWDEN-RENNA, CHERYL	LETTER REPORT: ETS 21721- CULTURAL RESOURCES SURVEY FOR THE REPLACEMENT OF POLE P414375, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA- IO 7011102	AECOM	
SD-14343	NADB-R - 1134343; Voided - WILSONS59	2013	WILSON, STACIE	LETTER REPORT: ETS 25416- CULTURAL RESOURCES SURVEY FOR ONE POLE INSTALLATION, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA- IO 7011102	AECOM	
SD-14705	NADB-R - 1134705; Voided - HDR01	2013	HDR ENGINEERING, INC.	HISTORIC PROPERTIES TREATMENT PLAN ESCONDIDO HYDROELECTRIC PROJECT SAN DIEGO COUNTY, CALIFORNIA	HDR ENGINEERING, INC.	
SD-14841	NADB-R - 1134841; Voided - NEWCOM02	2013	NEWCOMB, S. JOSHUA	SECTION 106 CONSULTATION FOR THE DRILL TEST WELL DEVELOPMENT OF COMMUNITY DRINKING WATER SUPPLY- SAN PASQUAL INDIAN RESERVATION	INDIAN HEALTH SERVICE	37-014670, 37-033418, 37-033419

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-14928	NADB-R - 1134928; Voided - MAYR184	2014	MAY, RONALD V., KILEY WALLACE, and MICHELLE D. GRAHAM	ARCHAEOLOGICAL RESOURCES SURVEY INDIAN HEALTH SERVICE PROJECT CA 13-E31 SAN PASQUAL DISTRICT B TANK REPLACEMENT PROJECT SAN DIEGO, CALIFORNIA	LEGACY 106, INC.	
SD-14935	NADB-R - 1134935; Voided - SYROPJ01	2014	SYROP, JEFF	LETTER REPORT: ETS 27165- CULTURAL RESOURCES SURVEY FOR THE REPLACEMENT OF POLE P612675, COMMUNITY OF VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA- IO2650163	GARCIA AND ASSOCIATES	
SD-15100	NADB-R - 1135100	2014	KAROLINA A. CHMIEL	LETTER REPORT: ETS 28580- CULTURAL RESOURCES SURVEY FOR THE C1030 SEGMENT A FIRM PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA--IO7011101	ICF INTERNATIONAL	37-007965, 37-017030
SD-15123	NADB-R - 1135123	2014	JEFF SYROP	LETTER REPORT: ETS 27407- CULTURAL RESOURCES MONITORING REPORT FOR THE REPLACEMENT OF POLE P718866, CITY OF ESCONDIDO, SAN DIEGO COUNTY, CALIFORNIA- IO 5005243	GARCIA AND ASSOCIATES	37-013432
SD-15160	NADB-R - 1135160	2012	KRISTIN TENNESEN	ETS # 22257, CULTURAL RESOURCES SURVEY FOR THE NEW POLE P248223, SKYLINE COUNTRY CLUB PROJECT, SAN DIEGO COUNTY, CALIFORNIA (HDR # 180681)	HDR	
SD-15327	NADB-R - 11315327	2015	Susan M. Hector	Archaeological Monitoring for the Excavation of Pole Hole for P18694, Wood to Steel Replacement, Valley Center, California (SDG&E eTS #27711)	NWB Environmental Services, LLC	
SD-15492	NADB-R - 1135492	2015	Susan M. Hector	Archaeological Monitoring for the Excavation of Pole Hole for P18693, Wood to Steel Replacement, Valley Center, California (SDG&E eTS #27699)	NWB Environmental Services, LLC	
SD-15593	NADB-R - 1135593	2014	Phil Fulton	CULTURAL RESOURCE ASSESSMENT CLASS III INVENTORY, VERIZON WIRELESS SERVICES, PARADISE MOUNTAIN FACILITY, COMMUNITY OF VALLEY CENTER, COUNTY OF SAN DIEGO, CALIFORNIA	LSA	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-15754	NADB-R - 1135754	2015	Carrie Wills and Sarah Williams	CULTURAL RESOURCE RECORDS SEARCH RESULTS FOR CELLCO PARTNERSHIP AND THEIR CONTROLLED AFFILIATES DOING BUSINESS AS VERIZON WIRELESS CANDIDATE 881458 VALLEY VIEW, SOUTH CANAL ROAD, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA	First Carbon Solutions	
SD-15939	NADB-R - 1135939	2014	Cindy L. Baker	NATIONAL REGISTER EVALUATION OF HISTORIC BUILT RESOURCES INCLUDED IN THE LICENSE SURRENDER OF THE ESCONDIDO PROJECT (FERC #176), SAN DIEGO COUNTY, CALIFORNIA	PAR Environmental Services, INC	
SD-16056	NADB-R - 1136056	2014	Shannon L. Loftus	CULTURAL RESOURCE RECORDS SEARCH AND SITE SURVEY AT&T SITE SD0875 LAKE WOHLFORD & MAEMAR 26725 LAKE WOHLFORD ROAD VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA 92082 CASPR# 3601700993	ACE Environmental	
SD-16206	NADB-R - 1136206	2016		ESCONDIDO CANAL HISTORIC DISTRICT, SAN LUIS REY RIVER, ESCONDIDO	HDR ENGINEERING, INC.	
SD-16252	NADB-R - 1136252	2015	Karolina A. Chmiel	LETTER REPORT: ETS 29765 - CULTURAL RESOURCES SURVEY FOR INSTALLATION OF TWO NEW POLES, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7074264	CHMIEL, KAROLINA A.	
SD-16322	NADB-R - 1136322	2015	ROY, JULIE	LETTER REPORT: ETS 30215 - CULTURAL RESOURCES SURVEY FOR REPLACEMENT ACTIVITIES FOR POLE P190938, COMMUNITY OF VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7074264	AECOM	
SD-16463	NADB-R - 1136463	2016	ROY, JULIE	LETTER REPORT: ETS 33338 - CULTURAL RESOURCES SURVEY FOR REPLACEMENT ACTIVITIES FOR POLE P810643, COMMUNITY OF VALLEY CENTER, NORTHEASTERN SAN DIEGO COUNTY, CALIFORNIA - IO 7074264	AECOM	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-16689	NADB-R - 1136689	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30028 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION F RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16690	NADB-R - 1136690	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30029 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION G RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16691	NADB-R - 1136691	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30030 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION H RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16693	NADB-R - 1136693	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30031 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION I RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16694	NADB-R - 1136694	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30033 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION K RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16697	NADB-R - 1136697	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30025 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION C RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16700	NADB-R - 1136700	2015	COX, NARA and CHMIEL, KAROLINA	ETS 30043 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION U RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16701	NADB-R - 1136701	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30042 - CULTURAL RESOURCES SURVEY REPORT FOR THE FIRM C1030 RECONDUCTOR SECTION T PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF International	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-16703	NADB-R - 1136703	2015	COX, NARA and CHMIEL, KAROLINA	ETS 30026 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION D RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16709	NADB-R - 1136709	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30027 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION E RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16711	NADB-R - 1136711	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30032 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION J RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16712	NADB-R - 1136712	2016	COX, NARA and CHMIEL, KAROLINA	ETS 30035 - CULTURAL RESOURCES SURVEY FOR THE FIRM C1030 SECTION M RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF International	
SD-16884	NADB-R - 1136884	2016	PENTNEY, SANDRA P.	CULTURAL RESOURCES LETTER REPORT FOR THE SAN PASQUAL UNDERGROUNDING PROJECY, SAN DIEGO COUNTY, CALIFORNIA	ATKINS	
SD-16885	NADB-R - 1136885; Submitter - 17350	2012	GUNDERMAN, SHELBY, STRINGER-BOWSHER, SARAH, and HALE, MICAH	CULTURAL AND HISTORICAL RESOURCES SURVEY AND EVALUATION REPORT FOR THE SAN LUIS REY INDIAN WATER RIGHTS SETTLEMENT AGREEMENT, ESCONDIDO CANAL UNDERGROUNDING, SAN DIEGO COUNTY, CALIFORNIA	ASM Affiliates, Inc	
SD-17003	NADB-R - 1137003	2016	COX, NARA	LETTER REPORT: ETS 30042 - CULTURAL RESOURCES MONITORING FOR FIRM C1030 SECTION T, POLE P167987, SAN PASQUAL, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF International	37-033820
SD-17005	NADB-R - 1137005	2017	COX, NARA	LETTER REPORT: ETS 30035 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION M, POLE P217098, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF International	37-035485

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-17531	NADB-R - 1137531	2017	COX, NARA	LETTER REPORT: ETS 30027 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION E, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	37-035467
SD-17532	NADB-R - 1137532	2017	COX, NARA	LETTER REPORT: ETS 30032 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION J, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	37-013433, 37-013434, 37-014670, 37-025522, 37-035626, 37-037605
SD-17533	NADB-R - 1137533	2018	COX, NARA	LETTER REPORT: ETS 30028 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION F, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	
SD-17534	NADB-R - 1137534	2017	COX, NARA	LETTER REPORT: ETS 30033 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION K, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	37-013409, 37-013421, 37-013437, 37-015470, 37-035469, 37-037606
SD-17535	NADB-R - 1137535	2017	COX, NARA	LETTER REPORT: ETS 30026 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION D, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	37-035466, 37-035467
SD-17536	NADB-R - 1137536	2017	COX, NARA	LETTER REPORT: ETS 30025 - CULTURAL RESOURCES MONITORING FOR FIRM C1030 SECTION C, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	
SD-17542	NADB-R - 1137542	2016	CHMIEL, KAROLINA	ADDENDUM: ETS 30029 - CULTURAL RESOURCES RESTING RESULTS FOR POLE P1, FIRM C1030 SECTION G RECONDUCTOR PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (IO 7071280)	ICF INTERNATIONAL	37-005489
SD-17543	NADB-R - 1137543	2017	COX, NARA	LETTER REPORT: ETS 30029 - CULTURAL RESOURCES MONITORING OF FIRM C1030 SECTION G, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 7071280	ICF	37-005489
SD-18183	Agency Nbr - PDS2018-MPA-18-011; NADB-R - 1138183	2019	GARRISON, ANDREW J. and BRIAN F. SMITH	A NEGATIVE CULTURAL RESOURCES SURVEY REPORT FOR THE BARNABA SOCCER FIELDS AND EVENT SPACE PROJECT, SAN DIEGO COUNTY, CALIFORNIA	BRIAN F. SMITH AND ASSOCIATES, INC.	37-038312, 37-038313, 37-038314

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-18256	NADB-R - 1138256; Other - D170240.08, TASK 1	2019	BEVER, MICHAEL R., MICHAEL VADER, MATTHEW GONZALES, and GARCIA KELLAR	CULTURAL RESOURCES SURVEY AND INVENTORY FOR THE HELLHOLE CANYON PRESERVE ADDITIONS, COUNTY OF SAN DIEGO, CALIFORNIA	ENVIRONMENTAL SCIENCE ASSOCIATES	37-011900, 37-011902, 37-011903, 37-011904, 37-011905, 37-011906, 37-011907, 37-013341, 37-013393, 37-013397, 37-026394, 37-026395, 37-026396, 37-026397, 37-026398, 37-038737, 37-038738, 37-038739, 37-038740, 37-038741, 37-038742, 37-038743, 37-038744, 37-038745, 37-038746
SD-18267	NADB-R - 1138267; OHP PRN - HHS_2016_0422_001	2016	BAKSH, MICHAEL	ADDENDUM TO THE CULTURAL RESOURCES STUDY FOR INDIAN HEALTH SERVICE PROJECT CA 13-B95 SAN PASQUAL DISTRICT C WATER MAIN PROJECT, VALLEY CENTER, CA	TIERRA ENVIRONMENTAL SERVICES	
SD-18268	NADB-R - 1138268; OHP PRN - BIA_2018_0320_001	2018	HALL, DAN	ARCHAEOLOGICAL SURVEY OF SEVEN PROPOSED HOMESITE LEASE AREAS ON THE SAN PASQUAL INDIAN RESERVATION, SAN DIEGO COUNTY, CALIFORNIA	BUREAU OF INDIAN AFFAIRS	
SD-18686	NADB-R - 1138686	2020	JORDAN, AMY	ARCHAEOLOGICA SURVEY FOR THE C1030 STRATEGIC UNDERGROUNDING PROJECT, SAN DIEGO COUNTY, CALIFORNIA (SDG&E ETS #43958, ASM PROJECT #23008.04)	ASM AFFILIATES	
SD-18827	NADB-R - 1138827	2019	MENVIELLE, JORDAN	LETTER REPORT: ETS 42496 - NEGATIVE CULTURAL RESOURCES SURVEY FOR PRIME TIER 3 C1030B, 2 POLE REPLACEMENT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA - IO 200543299	ICF	
SD-19102	NADB-R - 1139102	2016	HECTOR, SUSAN and JOSHUA A. TANSEY	ARCHAEOLOGICAL MONITORING FOR THE CMP POLE REPLACEMENT, P617894, BIA SAN PASQUAL, SAN DIEGO COUNTY, CALIFORNIA (SDG&E ETS #33136)	NWB ENVIRONMENTAL SERVICES, LLC	
SD-19289	NADB-R - 1139289	2020	NOBLE, MICHELLE D. and JOSHUA A. TANSEY	ARCHAEOLOGICAL MONITORING FOR THE SDG&E CMP POLE REPLC P133405 VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (SDG&E ETS #44523)	NWB ENVIRONMENTAL SERVICES, LLC	
SD-19486	NADB-R - 1139486	2020	BOWDEN-RENNA, CHERYL and LUCAS TUTSCHULTE	ETS 44791: CMP POLE REPLACEMENT P817062, SAN PASQUAL IR	SDG&E	

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Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SD-19543	NADB-R - 1139543; Other - PERMIT NUMBERS: PDS2020-IC-21-016	2021	PIGNIOLO, ANDREW and CAROL SERR	CULTURAL RESOURCE SURVEY FOR THE ALTMAN PLANT NURSERY PROJECT, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA	LAGUNA MOUNTAIN ENVIRONMENTAL, INC.	37-000757, 37-006860, 37-006862, 37-013587, 37-039622, 37-039623
SD-19742	NADB-R - 1139742	2021	JORDAN, AMY	ETS 48924: CULTURAL RESOURCES MONITORING FOR THE SDG&E C1030 PHASE 2 DIRECT UNDERGROUNDING CONSTRUCTION, LAKE WOHLFORD ROAD, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (ASM PROJECT #37001.04/001)	ASM AFFILIATES	
SD-19743	NADB-R - 1139743	2022	JORDAN, AMY	ETS 49024: CULTURAL RESOURCES MONITORING REPORT FOR THE SDG&E C1030 SUG AND RFS PROJECT, PHASE 1A DELRIDGE, VALLEY CENTER, SAN DIEGO COUNTY, CALIFORNIA (ASM PROJECT #37001.04/002)	ASM AFFILIATES	37-037925, 37-037926, 37-039676, 37-039677, 37-039678, 37-039679, 37-039730, 37-039739
SD-20176	NADB-R - 1140176	2021	JORDAN, AMY	ARCHAEOLOGICAL SURVEY FOR THE C1030 STRATEGIC UNDERGROUNDING PROJECT, PHASE 3A, SANTEE LANE, SAN DIEGO COUNTY, CALIFORNIA (SDG&E ETS #49345, ASM PROJECT #37001.04)	ASM AFFILIATES	

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-000256	CA-SDI-000256						SD-01284, SD-02973, SD-05307, SD-05433, SD-05496, SD-06305, SD-07230
P-37-000257	CA-SDI-000257						SD-01284, SD-02973, SD-05307, SD-05433, SD-05496, SD-06305, SD-07230
P-37-006703	CA-SDI-006703						SD-05433, SD-05496
P-37-009915	CA-SDI-009915						SD-04288, SD-05496, SD-06305
P-37-009916	CA-SDI-009916						SD-01284, SD-01788, SD-03251, SD-04288, SD-05433, SD-05496
P-37-014670							SD-03251, SD-06305, SD-14841, SD-17532
P-37-018787	CA-SDI-015665	Other - SPW-S-1				2000 (Tierra Environmental)	SD-05433
P-37-018788	CA-SDI-015666	Other - SPW-S-2				2000 (Tierra Environmental)	SD-05433
P-37-018789	CA-SDI-015667	Other - SPW-S-3				2000 (Tierra Environmental)	SD-05433, SD-06305
P-37-018790	CA-SDI-015668	Other - SPW-S-4				2000 (Tierra Environmental)	SD-05433, SD-06305
P-37-024394	CA-SDI-016176	Other - PS-S-1				2002 (Tierra Environmental Services)	
P-37-035241	CA-SDI-021773						
P-37-039840	CA-SDI-023267	IC Informal - RNID-5039					
P-37-039842	CA-SDI-023268	IC Informal - RNID-5039					
P-37-039843	CA-SDI-023269	IC Informal - RNID-5039					

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Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-000256	CA-SDI-000256						SD-01284, SD-02973, SD-05307, SD-05433, SD-05496, SD-06305, SD-07230
P-37-000257	CA-SDI-000257						SD-01284, SD-02973, SD-05307, SD-05433, SD-05496, SD-06305, SD-07230
P-37-000258	CA-SDI-000258						SD-02973, SD-05307, SD-05496
P-37-000277	CA-SDI-000277						SD-05496, SD-06305
P-37-000666	CA-SDI-000666						SD-06305, SD-11977
P-37-000669	CA-SDI-000669						SD-11977
P-37-000670	CA-SDI-000670						SD-01284, SD-05426, SD-06305, SD-11977, SD-14591
P-37-000757	CA-SDI-000757						SD-19543
P-37-001066	CA-SDI-001066						SD-00133, SD-08830, SD-08831, SD-08894
P-37-001067	CA-SDI-001067						SD-05056, SD-08830, SD-08831, SD-08894, SD-17537, SD-18811
P-37-005489	CA-SDI-005489						SD-00504, SD-17542, SD-17543
P-37-005511	CA-SDI-005511						SD-05496, SD-06305
P-37-006702	CA-SDI-006702						
P-37-006703	CA-SDI-006703						SD-05433, SD-05496
P-37-006704	CA-SDI-006704						SD-05496, SD-07119

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Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-006861	CA-SDI-006861						SD-00072
P-37-006942	CA-SDI-006942						
P-37-006943	CA-SDI-006943						
P-37-006944	CA-SDI-006944						
P-37-007965	CA-SDI-007965						SD-00063, SD-05496, SD-06305, SD-15100
P-37-009685	CA-SDI-009685						SD-06305
P-37-009915	CA-SDI-009915						SD-04288, SD-05496, SD-06305
P-37-009916	CA-SDI-009916						SD-01284, SD-01788, SD-03251, SD-04288, SD-05433, SD-05496
P-37-010562	CA-SDI-010562						SD-11977
P-37-010563	CA-SDI-010563						
P-37-011134	CA-SDI-011134						SD-00730, SD-06305
P-37-011136	CA-SDI-011136						
P-37-011513	CA-SDI-011513						SD-01827, SD-05496
P-37-011514	CA-SDI-011514						SD-01827, SD-05496
P-37-011555	CA-SDI-011555						
P-37-011556	CA-SDI-011556						
P-37-011557	CA-SDI-011557						
P-37-011558	CA-SDI-011558						
P-37-011559	CA-SDI-011559						
P-37-011560	CA-SDI-011560						
P-37-011561	CA-SDI-011561						
P-37-011562	CA-SDI-011562						
P-37-011563	CA-SDI-011563						

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Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-011564	CA-SDI-011564						
P-37-011565	CA-SDI-011565						SD-01146
P-37-011566	CA-SDI-011566						SD-01146
P-37-011567	CA-SDI-011567						SD-01146
P-37-011568	CA-SDI-011568						SD-01146
P-37-012206	CA-SDI-012206						SD-08555
P-37-013398	CA-SDI-013398						SD-05056, SD-08830, SD-08831, SD-08894
P-37-013427	CA-SDI-013427						
P-37-013432	CA-SDI-013432						SD-15123
P-37-013433	CA-SDI-013433						SD-17532
P-37-013434	CA-SDI-013434						SD-17532
P-37-013435	CA-SDI-013435						
P-37-013436	CA-SDI-013436						
P-37-013581	CA-SDI-013581						
P-37-014670							SD-03251, SD-06305, SD-14841, SD-17532
P-37-014932							SD-11977
P-37-014933							
P-37-014934							SD-11977
P-37-014935							
P-37-014936							
P-37-014937							
P-37-014938							
P-37-014943							
P-37-015472							
P-37-015473							
P-37-015474							

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Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-018318	CA-SDI-015279	Other - SP-S-1				1999 (Tierra Environmental)	SD-05426, SD-06305
P-37-018319	CA-SDI-015331	Other - SP-S-2				1999 (Tierra Environmental)	SD-05426, SD-06305
P-37-018320	CA-SDI-015341	Other - SP-S-3				1999 (Tierra Environmental)	SD-05426
P-37-018321	CA-SDI-015342	Other - SP-S-4				1999 (Tierra Environmental)	
P-37-018322		Other - SP-I-1				1999 (Tierra Environmental)	
P-37-018323		Other - SP-I-2				1999 (Tierra Environmental)	
P-37-018324		Other - SP-I-3				1999 (Tierra Environmental)	SD-05426
P-37-018786		Other - SPW-I-1				2000 (Tierra Environmental)	SD-05433
P-37-018787	CA-SDI-015665	Other - SPW-S-1				2000 (Tierra Environmental)	SD-05433
P-37-018788	CA-SDI-015666	Other - SPW-S-2				2000 (Tierra Environmental)	SD-05433
P-37-018789	CA-SDI-015667	Other - SPW-S-3				2000 (Tierra Environmental)	SD-05433, SD-06305
P-37-018790	CA-SDI-015668	Other - SPW-S-4				2000 (Tierra Environmental)	SD-05433, SD-06305
P-37-024394	CA-SDI-016176	Other - PS-S-1				2002 (Tierra Environmental Services)	
P-37-025522	CA-SDI-016944	Other - SPF-1				2004 (Tierra Environmental)	SD-17532
P-37-025523	CA-SDI-016945	Other - SPF-2				2004 (Tierra Environmental)	
P-37-029798	CA-SDI-019058	Other - HH-3				2008 (ASM Affiliates, Inc.)	
P-37-029799	CA-SDI-019059	Other - HH-2				2008 (ASM Affiliates, Inc.)	
P-37-029802		Other - Escondido Canal/Flume				2008 (ASM Affiliates, Inc.)	
P-37-029803		Other - Pecked Cobble				2008 (ASM Affiliates, Inc.)	
P-37-029804		Other - Quartz Point				2008 (ASM Affiliates, Inc.)	
P-37-033820		Other - SP-S-1				2014 (Legacy 106, Inc.)	SD-17003
P-37-033821		Other - SP-I-11				2014 (Legacy 106, Inc.)	
P-37-035241	CA-SDI-021773						
P-37-035466	CA-SDI-021782						SD-17535
P-37-035467	CA-SDI-021783						SD-17531, SD-17535

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-37-035468	CA-SDI-021784						
P-37-035469							SD-17534
P-37-035485							SD-17005
P-37-035624							
P-37-035625							
P-37-035626							SD-17532
P-37-037605		IC Informal - RNID-4050; Resource Name - ICF-C1030J-RD-ISO-1; Resource Name - ICF-C1030J-RD-ISO-1	Other	Historic	AH16 (Other) - Isolate; miscellaneous metal machinery	2017 (Rachel Droessler, ICF)	SD-17532
P-37-038737	CA-SDI-022811	IC Informal - RNID-4336					SD-18256
P-37-038738	CA-SDI-022812	IC Informal - RNID-4336					SD-18256
P-37-038739	CA-SDI-022813	IC Informal - RNID-4336					SD-18256
P-37-039319	CA-SDI-023032	IC Informal - RNID-4774					
P-37-039416		IC Informal - RNID-4795					
P-37-039613		IC Informal - RNID-4925					
P-37-039676	CA-SDI-023180	IC Informal - RNID-4968					SD-19743
P-37-039677	CA-SDI-023181	IC Informal - RNID-4968					SD-19743
P-37-039678		IC Informal - RNID-4968					SD-19743
P-37-039679	CA-SDI-023182	IC Informal - RNID-4968					SD-19743
P-37-039680	CA-SDI-023183	IC Informal - RNID-4968					
P-37-039725	CA-SDI-023216	IC Informal - RNID-4977					
P-37-039726	CA-SDI-023217	IC Informal - RNID-4977					
P-37-039730		IC Informal - RNID-4983					SD-19743
P-37-039739	CA-SDI-023226	IC Informal - RNID-4990					SD-19743
P-37-039840	CA-SDI-023267	IC Informal - RNID-5039					
P-37-039841		IC Informal - RNID-5039					
P-37-039842	CA-SDI-023268	IC Informal - RNID-5039					
P-37-039843	CA-SDI-023269	IC Informal - RNID-5039					

Appendix C:

CA DPR 523 Series Site Records

REDACTED

CA DPR 523 Series Site Records are redacted

Appendix D:

Tribal Consultation Records

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Art Bunce
Attorney
Barona Group of the Capitan Grande
P.O. Box 1416
Escondido, CA 92033

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Mr. Bunce:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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If you have any questions or require additional information, please do not hesitate to contact me at the letterhead address above, (916) 930-3981x342 or donna.meyer@ihs.gov.

Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Marcus Cuero
Chairpaerson
Campo Band of Diegueno Mission Indians
36190 Church Road, Suite 1
Campo, CA 91906

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Cuero:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Robert Pinto
Chairperson
Ewiiaapaayp Band of Kumeyaay Indians
4054 Willows Road
Alpine, CA 91901

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Cuero:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Kevin Osuna
Chairman
Iipay Nation of Santa Ysabel
4054 Willows Road
Alpine, CA 91901

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairman Osuna:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Rebecca Osuna
Chairperson
Inaja-Cosmit Band of Indians
2005 S. Escondido Boulevard
Escondido, CA 92025

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Osuna:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Lisa Cumper
Tribal Historic Preservation Officer
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Ms. Cumper:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. James Trujillo
Tribal Historic Preservation Officer
La Jolla Band of Luiseno Indians
22000 Highway 76
Pauma Valley, CA 92061

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Mr. Trujillo:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Gwendolyn Parada
Chairperson
La Posta Band of Diegueno Mission Indians
8 Crestwood Road
Boulevard, CA 91905

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Parada:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Angela Elliott Santos
Chairperson
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, CA 91905

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Elliott-Santos:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Michael Linton
Chairperson
Mesa Grande Band of Diegueno Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Linton:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Dr. Shasta Gaughen, Ph.D.
Tribal Historic Preservation Officer
Pala Band of Mission Indians
PMB 50, 35008 Pala Temecula Road
Pala, CA 92059

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Dr. Gaughen:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Temet Aguilar
Chairperson
Pauma Band of Luiseno Indians
P.O. Box 369
Pauma Valley, CA 92061

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Chairperson Aguilar:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Tuba Ebru Ozdil
Pechanga Cultural Analyst
Pechanga Band of Indians
P.O. Box 2183
Temecula, CA 92593

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Ms. Ozdil:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

Because the proposed undertaking has an effect on the landscape through ground disturbing activities, we respectfully request your interest regarding the undertaking; any comments regarding the undertaking; advise us on the identification and evaluation of any historic properties; including those of traditional religious and cultural importance; and, to participate in the resolution of any adverse effects, if applicable. The information you provide will assist IHS in the identification of historic properties pursuant to Section 106 of the NHPA.

If you have any questions or require additional information, please do not hesitate to contact me at the letterhead address above, (916) 930-3981x342 or donna.meyer@ihs.gov.

Sincerely,

Donna M. Meyer, CEM, HPS
Environmental Protection Specialist
Area Environmental-Historic Coordinator

Enclosure

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Jill McCormick
Historic Preservation Officer
Quechan Tribe of the Fort Yuma Reservation
P.O. Box 1899
Yuma, AZ 85396

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Ms. McCormick:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Public Health Service

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Sacramento, California 95814-4708

July 23, 2024

Ms. Cheryl Madrigal
Cultural Resource Manager/Tribal Historic Preservation Officer
Rincon Band of Luiseno Indians
One Government Center Lane
Valley Center, CA 92082

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Ms. Madrigal:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Joseph Ontiveros
Tribal Historic Preservation Officer
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, CA 92581

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Mr. Ontiveros:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Environmental Protection Specialist
Area Environmental-Historic Coordinator

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Ms. Bernice Paipa
Cultural Resource Specialist
Sycuan Band of the Kumeyaay Nation
910 Willow Glen Drive
El Cajon, CA 92019

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Ms. Paipa:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Environmental Protection Specialist
Area Environmental-Historic Coordinator

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DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Indian Health Service
California Area Office
650 Capitol Mall, Suite 7-100
Sacramento, California 95814-4708

July 23, 2024

Mr. Ray Teran
Resource Management Director
Viejas Band of Kumeyaay Indians
1 Viejas Grade Road
Alpine, CA 91901

RE: CA17-E61: San Pasqual Community Sewer System Project

Dear Mr. Teran:

Section 101(d)(6)(B) of the National Historic Preservation Act of 1966 (NHPA) as amended requires the Department of Health and Human Services - Indian Health Service (IHS) to consult with any Indian Tribe that may attach religious and cultural significance to historic properties that might be affected by an IHS undertaking. Your Tribe has been identified as a Tribe that may have an interest in an IHS undertaking. IHS intends to provide federal assistance to our applicant identified above to expand sewer line services to various areas within the Reservation, as well as the development of a Wastewater Treatment Plant. The undertaking is located on the San Pasqual Reservation near Valley Center, San Diego County, within Sections 14, 15, 21, and 22, Township 11 South, Range 1 West of the USGS 2021 Rodriguez Mountain 7.5 minute quadrangle (33.142268, -116.790850). The Area of Potential Effect (APE) is defined as 173 acres of land which includes various linear segments for proposed sewer lines plus a 50-ft buffer on each side, as well as the location for a proposed Wastewater Treatment Plant (WWTP).

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Environmental Protection Specialist
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Figure 1: Vicinity Map