Appendix A

Geotechnical Investigation Report

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Geotechnical Investigation Report

Alessandro Ponds Optimization Phase II
Eastern Municipal Water District
San Jacinto, California

Prepared for:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92570

May 22, 2026
Project No.: 260092.3

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May 22, 2026
Project No.: 260092.3

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Subject: Geotechnical Investigation Report
Alessandro Ponds Optimization Phase II
Eastern Municipal Water District
San Jacinto, California

Dear Mr. Olivas,

In accordance with your request and authorization, we are presenting the results of our geotechnical investigation for the Alessandro Ponds Optimization Phase II project located at Alessandro Ponds in San Jacinto, California. The purpose of our investigation is to characterize subsurface conditions at the site, to identify seismic and geologic hazards present at the site, and to provide geotechnical engineering recommendations for the proposed improvements.

Based on our findings, the development of the site is geotechnically feasible, provided that the recommendations in this report are incorporated into the design and are implemented during construction of the project.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,

TWINING, INC.

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1. INTRODUCTION

This report presents the results of the geotechnical investigation performed by Twining, Inc. (Twining) for the Alessandro Ponds Optimization Phase II project located at Alessandro Ponds in San Jacinto, California. A description of the site and the proposed improvements are provided in the following section. The objectives of this investigation are to characterize subsurface conditions at the site, to identify seismic and geologic hazards present at the site, and to provide preliminary geotechnical recommendations for design and construction of the proposed development.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The proposed project consists of the deepening of the existing retention ponds at the Alessandro Ponds site in San Jacinto. The material excavated from the bottoms of the ponds will be used to increase the height of the existing embankments and side slopes around the ponds. Additionally, new water lines and other associated improvements are anticipated.

The project site is located north of the Ramona Expressway north of the intersection of Vernon Avenue in San Jacinto, as shown on Figure 1 – Site Location Map. The site plan and borings performed during this investigation are depicted on Figure 2 – Site Plan and Boring Location Map. The site is bounded by the San Jacinto River on the north, the expressway on the south, a nursery on the west, and vacant land on the east.

The approximate site coordinates where the project is located are latitude 33.80325°N and longitude 116.94812°W, and the site is located on the San Jacinto, California 7½-Minute Quadrangle, based on the United States Geological Survey (USGS) topographic maps (USGS 2021).

The site is currently occupied by four existing retention basins. The area of the site generally slopes towards the northwest and the site is at an elevation of approximately 1,556 feet above mean sea level (msl) on the southeast and slopes to approximately 1,540 at the northwest. The site occupies approximately 37.5 acres.

3. SCOPE OF WORK

Our scope of work included review of background information, pre-field activities and field exploration, laboratory testing, engineering analyses and report preparation. These tasks are described in the following subsections.

3.1. Literature Review

We reviewed readily available background data including published geologic maps, topographic maps, aerial photographs, and seismic hazard maps and literature relevant to the subject site.

3.2. Pre-Field Activities and Field Exploration

Before starting our exploration program, we performed a site reconnaissance to observe the general surficial conditions at the site, to select field exploration locations, and to plan field logistics including health and safety. After exploration locations were delineated, Underground Service Alert was notified of the planned locations a minimum of 72 hours prior to excavation.

The field exploration was conducted between March 7 and March 8, 2026, and consisted of drilling, testing, sampling, and logging 7 exploratory borings (B-1 through B-7). Borings B-1 through B-5 were drilled using CME-75 truck-mounted drill rig equipped with 8-inch-diameter HSA. The remainder of the borings were advanced using a 5-inch-diameter hand auger. The borings were advanced to approximately 6.5 to 50 feet below the existing ground surface (bgs). The approximate locations of the borings are shown on Figure 2 – Site Plan and Boring Location Map.

Driven samples of the subsurface materials were obtained from the borings using a Standard Penetration Test (SPT) sampler designed with room for liners without liners placed and a modified California split spoon sampler. The samplers were driven using a 140-pound automatic hammer falling approximately 30 inches. The blow-counts to drive the samplers were recorded, and subsurface conditions encountered in the borings were logged by a Twining geologist. Samples obtained from the borings were transported to Twining's geotechnical engineering laboratory for examination and testing.

Borings B-1, B-3, and B-5, were converted to monitoring wells at the completion of drilling. For the other borings, upon completion of drilling, sampling and testing, the borings deeper than 5 feet were backfilled by the drilling subcontractor using neat cement grout and the surface patched with topsoil. The shallower borings were backfilled with cuttings and the surface patched to match existing conditions.

Detailed descriptions of the borings and the soils encountered during drilling are presented in Appendix A.

3.3. Geotechnical Laboratory Testing

Laboratory tests were performed on selected samples obtained from the borings to aid in the soil classification and to evaluate the engineering properties of site soils. The following tests were performed in general accordance with ASTM standards:

- In-situ moisture and density;
- No. 200 wash sieve;
- Atterberg Limits;
- Consolidation;
- Direct shear;
- Maximum dry density and optimum moisture; and
- Corrosivity.

Detailed laboratory test procedures and results are presented in Appendix B – Laboratory Testing.

3.4. Engineering Analyses and Report Preparation

We compiled and analyzed the data collected from our field exploration and laboratory testing. We performed engineering analyses based on our literature review and data from field exploration and laboratory testing programs. Our analysis included the following:

- Site geology and subsurface conditions;
- Groundwater conditions;
- Geologic hazards and seismic design parameters;
- Liquefaction potential and seismic settlement;
- Soil corrosion potential;

- Soil collapse and expansion potential;
- Site preparation and earthwork;
- Temporary excavations;
- Suitability of on-site soils for foundation support;
- Foundation design parameters including bearing capacity, settlement, and lateral resistance for minor structures;
- Seepage and slope stability analyses for retention pond embankments and side slopes;
- Modulus of subgrade reaction concrete slab-on-grade design; and
- Concrete slab-on-grade support.

We prepared this report to present our conclusions and recommendations from this investigation.

4. GEOLOGY AND SUBSURFACE CONDITIONS

The geology and subsurface conditions at the site are based on the results of our field investigation (Appendix A) and our review of published geologic maps (Figure 3).

4.1. Site Geology and Subsurface Conditions

According to Geologic Map of the San Jacinto Quadrangle, California, prepared by Dibblee and Minch (Dibblee, 2003), the site is underlain by alluvial deposits (Qa) consisting of "alluvial sand and clay of valley areas, covered by gray soil, includes stream channel gravel and sand in mountain area." A portion of the geologic map is reproduced as Figure 3 – Regional Geologic Map. A generalized description of the subsurface conditions encountered is provided below. Detailed descriptions of the earth materials encountered in the exploratory borings are presented in Appendix A – Field Exploration

4.1.1. Artificial Fill

Artificial fill was encountered in all of the hollow-stem auger borings and generally ranged in depth from approximately 3 to 5 feet bgs. The fill generally consisted of slightly moist, silty sand. No fill was encountered in the hand auger borings in the bottom of the basin. However, in one hand auger boring (B-7), approximately six inches of topsoil consisting of roots and decayed organic material was encountered.

4.1.2. Alluvium

Underlying the artificial fill was alluvium to the depth of exploration in all of the borings. The deposits encountered in the borings generally consist predominantly of brown to greyish brown, silty sand to poorly graded sand with silt. The material was generally slightly moist until groundwater was encountered and the materials turned wet.

4.2. Groundwater Conditions

Water was encountered in six of the seven borings performed. Boring B-7 was performed in the southernmost basin and did not encounter water. The top of boring B-7 was approximately 1,546 feet msl and the boring was advanced to approximately 9 feet bgs. The water levels encountered in the borings are shown on the attached logs. We note that water encountered in the borings was likely not true groundwater, but perched water that had infiltrated from the retention ponds.

There are currently two existing groundwater wells at the site that are approximately 212 and 249 feet deep. The highest groundwater levels measured in the wells are shown in the table below.

Table 1 – Existing On-Site Water Wells

State Well Number	Well Depth (ft)	Well Elevation (ft)	Historic High Groundwater Depth (ft)	Groundwater Elevation (ft)	Date of High Groundwater
338005N1169456W001	212	1,557.74	198.4	1,358.64	04/10/2025
338030N1169489W001	249	1,548.63	207.1	1,340.93	04/10/2025

Groundwater conditions may vary across the site due to stratigraphic and hydrologic conditions and may change over time as a consequence of seasonal and meteorological fluctuations, or activities by humans at this and nearby sites.

5. GEOLOGIC HAZARDS AND SEISMIC DESIGN CONSIDERATIONS

The site is in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered high during the design life of the proposed development. The hazards associated with seismic activity in the vicinity of the site area are discussed in the following sections.

5.1. Active Faulting and Surface Fault Rupture

Based on our review of the State of California Earthquake Zones of Required Investigation (formerly known as a Special Studies Zone) (CGS, 2018) and the general plan of City of San Jacinto, the ponds are not located within a known active fault zone. The closest Alquist-Priolo fault zone to the ponds is the San Jacinto Fault Zone with the Claremont Fault located approximately 800 feet to the northeast of the ponds and the Casa Loma fault approximately 2.06 miles to the southwest of the ponds. It is our opinion that the likelihood of surface fault rupture at the site during the life of the proposed improvements is low.

5.2. Liquefaction and Seismic Settlement Potential

Liquefaction is the phenomenon in which loosely deposited granular soils and non-plastic to low plasticity fine-grained soils located below the water table, undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure and causes the soil to behave as a fluid or experience cyclic softening for a short period of time.

Liquefaction is generally known to occur in loose, saturated, relatively clean, cohesionless soils at depths shallower than approximately 50 feet. Factors to consider in the evaluation of soil liquefaction potential include groundwater conditions, soil type, grain size distribution, relative density, degree of saturation, and both the intensity and duration of ground motion. In addition, Bray and Sancio (2006) found fine-grained soils with a plasticity index (PI) < 12 and moisture content > 85 percent of the liquid limit are susceptible to liquefaction. In order to assume that a soil is not potentially liquefiable, the criteria of Bray and Sancio for soils “not susceptible” to liquefaction should be utilized, i.e., a moisture content equal to or less than 80% of the liquid limit, or a PI equal to or greater than 18.

The saturated moisture content should be utilized for the moisture content percentage of the liquid limit.

The CGS does not provide liquefaction hazard map for the project site. Based on the historically highest groundwater level deeper than 50 feet (see Section 4.2) , the potential for liquefaction should be considered negligible at the site. However, water storage in the ponds will saturate the foundation and embankment soil below the water level. Therefore, we performed liquefaction analysis assuming water levels in the ponds are at the maximum design elevations. Ground motion parameters used in the liquefaction analysis include a peak ground acceleration of 0.45 g and a moment earthquake magnitude Mw 7.91, corresponding to the 50th percentile ground motion obtained from our deterministic seismic hazard analysis described in Section 5.5. The analysis used the blow-counts from borings B-1, B-3, and B-5 we performed at the site, the computer program LiqSVs version 2.3.4.1 (Geologismiki, 2019), and the 1997 NCEER procedure (Youd *et. al.*, 2001). Details of the liquefaction analysis are provided in Appendix C. Results of the analysis indicate liquefiable soil layers at all three boring locations as summarized in Table 2.

Seismic settlement can occur when loose to medium dense granular materials densify during seismic shaking and liquefaction. Seismic settlement may occur in dry, unsaturated, as well as saturated soils. We evaluated liquefaction settlement as well as dry sand seismic settlement using LiqSVs version 2.3.4.1 and parameters for the liquefaction analysis and data from borings B-1, B-3, and B-5. Details of the seismic settlement analysis are provided in Appendix C. The calculated seismic settlements at the three boring locations are presented in Table 2. The differential settlement is estimated to be half of the calculated total settlement over a horizontal distance of 30 feet.

Table 2 – Summary of Liquefaction and Seismic Settlement Analyses

Boring No.	Approximate Existing Ground Surface Elevation (feet msl)	Depth of Water Encountered During Drilling (feet)	Approximate Water Elevation during Earthquake (feet msl)	Depths of Calculated Liquefiable Layers (feet)	Approximate Seismic Settlement (inches)
B-1	1,545	9.3	1,544	1 – 15 25 – 30	8
B-3	1,551	11.3	1,554	10 – 15 42.5 – 47.5	5
B-5	1,551	24.3	1,554	3 – 15 25 – 35 42.5 – 47.5	9

5.3. Landslides

The site is relatively flat and it is our opinion that the potential for earthquake-induced landslides to occur at the site is low.

5.4. Flooding, Inundation, Tsunami and Seiche

The ponds are adjacent to the San Jacinto River. According to Riverside County Floodplain Map, the ponds are located within the area with reduced risk due to levee.

According to the Inundation Map of the Division of Safety of Dams (DSOD) of the California Department of Water Resources, the ponds are not located within an inundation hazard area.

Tsunamis are waves generated by massive landslides near or under sea water. The ponds are not located within a coastal area. Tsunami hazards at the project site do not exist.

Seiches are standing wave oscillations of an enclosed and semi-enclosed water body (e.g., a lake, reservoir, or bay) after the original driving force has dissipated. Resulting oscillation could cause water waves. The most serious consequences of a seiche would be the overtopping and failure of an embankment. The freeboard of the embankment should accommodate the height of water waves in the ponds caused by seiches.

5.5. Deterministic Seismic Hazard Analysis (DSHA)

The deterministic seismic hazard analysis (DSHA) in this section evaluates the 50th percentile (i.e., median) hazard values, including the peak ground acceleration (PGA) and spectral accelerations (S_a) at 21 spectral response period (T) values from 0.01 to 10 s, based on the 2018 NSHM (Petersen *et al.* 2020; Powers *et al.* 2021). The NSHM considers spatially varying basin depth when computing hazard at periods greater than 0.5 s to better estimate basin effects. The two fundamental components of the NSHM are (1) seismic source models and (2) ground motion models (GMMs). The GMMs are discussed in Section 5.5.1 and the seismic source parameters are discussed in Section 5.5.2 and presented in Table 3.

5.5.1. Ground Motion Models (GMMs)

The GMMs used in the DSHA are from the Pacific Earthquake Engineering Research Center (PEER) Next Generation Attenuation (NGA) West 2 project and include Abrahamson *et al.* (2014), Boore *et al.* (2014), Campbell and Bozorgnia (2014), and Chiou and Youngs (2014). The weighted average of the four GMMs is taken as the total response for the site, with equal weights of 0.25 applied to each GMM. These GMMs and weighting schemes are recommended by the national seismic hazard model project (NSHMP) (Petersen et al. 2024).

The GMMs provide ergodic median ground motion (RotD50) estimates as a function of the V_{S30} and basin depth parameters $Z_{1.0}$ and $Z_{2.5}$ (depths to shear wave velocities of 1.0 and 2.5 kilometers per second, respectively). The V_{S30} value used in the analysis is 190 m/s discussed above. The basin depth parameters $Z_{1.0}$ and $Z_{2.5}$ are estimated to be approximately 512 and 2,964 meters based on Chiou and Youngs (2014) and Campbell and Bozorgnia (2014), respectively. Our analysis includes adjustment for directivity effects and directionality effects to obtain the maximum direction ground motion (RotD100).

The directivity effects are accounted for using directivity scale factors based on a weighted average of three directivity adjustment models (Bayless *et al.*, 2020; Bayless and Somerville, 2013; Chiou and Spudich, 2013). The weighted average directivity factors are queried from the Natural Hazards Risk and Resiliency Research Center (NHR3) directivity-based PSHA Interactive Tool (Al Atik *et al.*, 2023; Mazzoni *et al.*, 2023) using the default weighting scheme

from the tool. The default weighting scheme is used in the statewide Directivity-Based PSHA for California. The scaling factors have a lower bound of 1.0 and are queried for the return period of 475 years. At T values less than 0.5 second, the factor is set to 1.0. The directivity factors are shown in Table 4.

The directionality effects are accounted for using directionality scale factors described in Section 21.2 of . The factors are 1.2 for spectral response periods less than or equal to 0.2 s, 1.25 for a period of 1.0 s, 1.3 for periods greater than or equal to 10 s, and between these periods are obtained by linear interpolation. The directionality scale factors are shown in Table 4 along with the directivity scale factors.

5.5.2. Seismic Source Models

The deterministic response spectral acceleration at each period is taken as the largest such calculated acceleration for scenario earthquakes on all known faults within the region. The scenario earthquakes are determined from de-aggregation analysis for Site Class DE. Scenario earthquakes contributing less than 10% of the largest contributor at each period are ignored (). The controlling faults and relevant fault parameters corresponding to the scenario earthquakes are used in our DSHA and presented in Table 3. The relevant parameters of the controlling faults are obtained from USGS Model Maps (Clayton and Powers, 2023, https://earthquake.usgs.gov/nshmp/source/model-maps?model=CONUS_2018) and include:

R_{RUP} = Closest distance to coseismic rupture.
M_w = Moment magnitude.
W = Fault rupture width.
Z_{TOR} = The depth to the top of the rupture plane.
Z_{BOT} = The depth to the bottom of the rupture plane.

Table 3 – Scenario Earthquakes and Fault Parameters Used in DSHA

Scenario Earthquakes			Fault Parameters				
Fault Name	Source Distance R_{RUP} (km)	Earthquake Magnitude, Mw	Dip (degrees)	Width W (km)	Depth to Top of Rupture, Z_{TOR} (km)	Depth to Bottom of Rupture, Z_{BOR} (km)	Slip Sense
San Jacinto (stepover) (2)	2.55	7.91	90	16.8	0	16.8	Strike-Slip
San Andreas (San Bernardino, south) (6)	21.05	7.59	90	12.8	0	12.8	Strike-Slip

The DSHA is performed for the scenario earthquakes on each fault to obtain the 5%-damped 50th percentile response spectral accelerations using the four GMMs and the USGS NSHMP web services (https://earthquake.usgs.gov/ws/nshmp/) (Powers et al., 2022; Powers and Altekruse, 2022).

The resulting 5%-damped 50th percentile response spectral accelerations for the scenario earthquakes are used to develop the deterministic response spectrum by adjusting the largest spectral acceleration at each period. The spectral accelerations for the San Jacinto scenario earthquake are found to be the largest spectral acceleration at each period. The largest spectral acceleration at each period is finally adjusted for directivity and directionality effects to obtain

the deterministic response spectral accelerations as presented in Table 4. We note that considering the liquefaction potential at the site, site response analysis is required to determine spectral accelerations for periods longer than 0.5 seconds.

Additionally, the DSHA determines a value of 0.446 g for the largest 50th-percentile MCE_G PGA for scenario earthquakes on all known active faults within the site region.

Table 4 – Deterministic Response Spectra

Period (s)	Adjustment Factors		Deterministic Spectral Acceleration, S_a[1] (g)	
	Directivity Factor	Maximum Direction Factor	Largest from Scenario Earthquakes	Deterministic Ground Motion
(a)	(b)	(c)	(d)	(e) = (d)*(b)*(c)
0.01	1	1.2	0.524	0.629
0.02	1	1.2	0.522	0.626
0.03	1	1.2	0.500	0.601
0.05	1	1.2	0.500	0.600
0.075	1	1.2	0.562	0.675
0.1	1	1.2	0.639	0.767
0.15	1	1.2	0.757	0.909
0.2	1	1.2	0.907	1.089
0.25	1	1.2031	1.053	1.266
0.3	1	1.2063	1.156	1.394
0.4	1	1.2125	1.284	1.556
0.5	1.006	1.2188	1.374	1.685
> 0.5	SRA[2]			

Notes:
[1] S_a at other T values less than 0.5 s should be determined by linear interpolation.
[2] Site response analysis is required.

5.6. 2025 CBC Site Class and Seismic Design Parameters

The 2025 CBC and ASCE 7-22 require that site class be determined using the average small-strain shear wave velocity, V_{S30}, measured from the ground surface to a depth of 100 feet (30 meters) of the soil profile. When measured shear wave velocities are not available for a site, shear wave velocity can be estimated using appropriate correlations with geotechnical data, including standard penetration test (SPT) blow counts, cone penetration test (CPT) tip resistance, or others, measured at the site.

Based on ASCE 7-22, where the available data used to establish the shear wave velocity profile extends to depths less than 100 feet but more than 50 feet, and the site geology is such that soft layers are unlikely to be encountered between 50 and 100 feet, the shear wave velocity of the last layer in the profile should be extended to 100 feet for the calculation of V_{S30}.

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ASCE 7-22 further requires that site class based on estimated values of V_{S30} should be derived using V_{S30}, $V_{S30}/1.3$, and $1.3V_{S30}$ when correlation models are used to derive shear wave velocities. If the different average velocities result in different site classes, the most critical of the site classes for ground motion analysis at each period should be determined based on the most critical spectral response acceleration at the period. As a result, the site class may vary with period.

Based on the blow counts from borings B-1, B-3, and B-5, the average shear wave velocity in the upper 100 feet (VS_{100}) was determined to be approximately 626 feet per second (ft/s), with corresponding $V_{S30}/1.3$ and $1.3V_{S30}$ values of 481 and 813 ft/s, respectively.

Considering the liquefaction potential at the site, the site seismic class is D for structures with fundamental periods no more than 0.5 seconds and F for structures with fundamental periods more than 0.5 seconds.

The site class and seismic design parameters that are period dependent for the two-period MCE_R and design response spectra are determined in Table 5. The full two-period MCE_R and design response spectra can be developed following Section 11.4.5.2 of ASCE 7-22. The 5%-damped multi-period MCE_R and design response spectra and corresponding site class are developed in Table 6. These seismic design parameters are obtained from the ASCE Hazard Tool (https://ascehazardtool.org/) which is from the USGS Seismic Design Geodatabase based on the mapped general procedure. For site class F, site response analyses per Chapter 21 of ASCE 7-22 should be performed to obtain the seismic design parameters, which, if needed, can be performed under a separate proposal.

Table 5 – 2025 CBC and ASCE 7-22 Seismic Design Parameters

Parameters	Value	
Site Coordinates	Latitude: 33.80325°N Longitude:116.94812°W	
Period, T (seconds)	T ≤ 0.5	T > 0.5
Site Class	D	F
Mapped Spectral Acceleration Parameter at Period of 0.2-Second, S_s (g)	2.42	SRA[3]
Mapped Spectral Acceleration Parameter at Period 1-Second, S_1 (g)	0.88	SRA
Adjusted MCE_R[1] Spectral Response Acceleration Parameter, S_{MS} (g)	2.46	SRA
Adjusted MCE_R[1] Spectral Response Acceleration Parameter, S_{M1} (g)	2.33	SRA
Design Spectral Response Acceleration Parameter, S_{DS} (g)	1.64	SRA
Design Spectral Response Acceleration Parameter, S_{D1} (g)	1.55	SRA
Peak Ground Acceleration (PGA) adjusted for Site Effects, PGA_M (g)	0.89	SRA
Seismic Design Category[2]	E	SRA

Notes: [1] Risk-Targeted Maximum Considered Earthquake.
[2] For S_1 greater than or equal to 0.75 g, the Seismic Design Category is E for risk category I, II, and III structures and F for risk category IV structures.
[3] Site response analysis is required.

Table 6 – 2025 CBC and ASCE 7-22 Multi-Period Spectrum Based on the General Procedure (USGS Geodatabase)

Period T (s)	5%-Damped Spectral Acceleration, S_a[1] (g)		Site Class
	MCE_R Spectrum	Design Spectrum	
0	1.03	0.68	D
0.01	1.03	0.69	D
0.02	1.03	0.69	D
0.03	1.05	0.7	D
0.05	1.18	0.79	D
0.075	1.43	0.95	D
0.1	1.63	1.09	D
0.15	1.94	1.3	D
0.2	2.24	1.49	D
0.25	2.49	1.66	D
0.3	2.61	1.74	D
0.4	2.62	1.74	D
0.5	2.52	1.68	D
> 0.5	SRA[2]	SRA	F

Notes:
[1] S_a at other T values less than 0.5 s should be determined by linear interpolation.
[2] Site response analysis is required.

5.7. Deaggregated Seismic Source Parameters

We performed a seismic hazard de-aggregation analysis for the peak ground acceleration with a probability of exceedance of 10% in 50 years, corresponding to a return period of approximately 475 years. The analysis used the USGS Earthquake Hazard Tool based on the 2018 Conterminous US National Seismic Hazard Model (NSHM). The results of analysis indicate the controlling modal moment magnitude Mw and fault distance R are 8.1 and 2.7 kilometers (km), respectively, for both Site Classes D and BC.

6. SLOPE STABILITY AND SEISMIC DEFORMATION

We performed engineering analysis to evaluate the stability of the embankments and side slopes. The analysis includes seepage, slope stability, and seismic deformation. The slope stability analysis includes surficial static stability, global static stability, and global seismic stability. The analysis cases are presented in Table 7.

The seepage analysis is performed to obtain the average exit gradient at the toe of the embankment to estimate factors of safety against soil piping and boiling and to obtain pore pressure conditions in the soils for use in global slope stability analysis.

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The global seismic stability is analyzed to obtain the seismic yield coefficient ky. The ky is then used to estimate seismic deformation of the embankment and side slopes, using the Stewart et al. (2003) procedure.

Table 7 – Summary of Slope Stability and Seismic Deformation Analyses

Analysis Case	Upstream Water Level Elevation (feet msl)	Downstream Water Level Elevation (feet msl)	Calculated Factor of Safety	Seismic Yield Coefficient Ky[1]	Approximate Seismic Deformation (inches)
Surficial Static Stability	Slope surface	Slope surface	1.63	NA[2]	NA
(a) Seepage for (b)	1,554	Bottom of pond	3.0	NA	NA
(b) Global Static Stability	1,554	Bottom of pond	1.77	NA	NA
(c) Seepage for (d)	1,554	Bottom of pond	3.0	NA	NA
(d) Global Seismic Stability	1,554	Bottom of pond	1.0	0.24	**7**
(e) Seepage for (f)	1,554	1,547	3.0	NA	NA
(f) Global Seismic Stability	1,554	1,547	1.0	0.28	**3.5**

Notes: 1. NA = not applicable.
2. Seismic yield coefficient ky corresponds to a seismic factor of safety of unity.

Details of the analysis are provided in Appendix D. Results of the analysis are summarized in Table 7. The average hydraulic exit gradient is about 1/3, indicating a factor of safety of 3 against soil piping and boiling. The static stability has a factor of safety greater than 1.5. The yield seismic coefficient ky is 0.24 for the most critical condition, Case (d), and 0.28 for the less critical condition, Case (f).

The seismic slope deformation estimated using the yield seismic coefficient ky and the Stewart et al. (2003) procedure is approximately 7 inches for Case (d), and 3.5 inches for Case (f).

A seismic slope deformation on the order of 6 inches is acceptable according to CGS Special Publication 117A (CGS, 2008). Considering the low likelihood of the coincidence of the most critical water levels with the design earthquake ground motion as well as the conservative model parameters used in the analysis, the calculated 7 inches of seismic slope deformation is considered acceptable for the embankment and side slopes.

The analysis results indicate the proposed improvements to the embankments and ponds are feasible, provided that new fill materials placed on the embankments consist of sand with sufficient fines content and are adequately compacted such that the compacted new fill materials have the minimum ultimate and peak shear strength parameters shown in Table D-1 in Appendix D for embankment soil. The excavated onsite silty sand is expected to meet the requirements when compacted to 95% relative compaction as determined by ASTM D1557.

7. GEOTECHNICAL ENGINEERING RECOMMENDATIONS

Based on the results of our literature review, field exploration, laboratory testing, and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations in this report are incorporated into the design plans and are implemented during construction.

7.1. General Considerations

Geotechnical engineering recommendations presented in this report for the proposed project are based on our understanding of the proposed development, subsurface conditions encountered during our current and other's previous field exploration, the results of laboratory testing on soil samples taken from the site, and our engineering analyses.

The following sections present our conclusions and recommendations pertaining to the engineering design for this project. If the design substantially changes, then our geotechnical engineering recommendations would be subject to revision based on our evaluation of the changes.

7.2. Soil Collapse and Expansion Potential

Collapsible soil is defined as soil that, when wetted, has the potential for settlement. Twining has collected samples and performed laboratory testing to evaluate this condition, based on our laboratory results, the onsite soils have a negligible collapse potential.

Based on the field classification of soils encountered and laboratory expansion index (EI) testing, the expansive potential for onsite soils is very low with an EI value of zero.

7.3. Corrosive Soil Evaluation

The potential for the on-site materials to corrode buried steel and concrete improvements was evaluated. Laboratory tests on one representative sample of on-site soils were performed to evaluate pH and electrical resistivity, as well as chloride and sulfate contents. The pH and electrical resistivity tests were performed in accordance with California Test 643, and the sulfate and chloride tests were performed in accordance with California Tests 417 and 422, respectively. These laboratory test results are presented in Appendix B.

Based on the 2021 Corrosion Guidelines of California Department of Transportation (Caltrans), for structural elements, a site is considered corrosive if one or more of the following conditions exist for the representative soil samples taken at the site:

- Chloride concentration is 500 ppm or greater,
- Sulfate concentration is 1500 ppm or greater,
- pH is 5.5 or less.

The sample tested indicates:

- Water-soluble chloride contents of 338 ppm,
- Water-soluble sulfate contents of 179 ppm,
- pH values of 8.
- An electrical resistivity value of 1,300 ohm-cm.

Based on these results and the Caltrans guidelines, the near-surface soils at the site are classified as non-corrosive.

Discussions of corrosion protection for reinforced concrete and buried metal are provided below. Further interpretation of the corrosivity test results and associated corrosion design and construction recommendations are within the purview of a corrosion specialist. It is recommended that , during project design, a qualified corrosion engineer be retained to review our corrosivity test results, to

evaluate the general corrosion potential with respect to construction materials at the site, and to review the proposed design.

7.3.1. Reinforced Concrete

Laboratory tests indicate that the exposure category for sulfate attack on concrete in contact with the on-site soils is "S0" based on ACI 318, Table 4.3.1. As a minimum, we recommend that Type II cement and water-cement ratio of no greater than 0.5 be used on the project.

Test results indicate that the potential for chloride attack of reinforcing steel in concrete structures and pipes in contact with soil is negligible. However, if needed, a corrosion specialist may be consulted, during project design, for protection from chloride attack.

7.3.2. Buried Metal

A factor for evaluating corrosivity to buried metal is electrical resistivity. The electrical resistivity of a soil is a measure of resistance to electrical current. Corrosion of buried metal is directly proportional to the flow of electrical current from the metal into the soil. As resistivity of the soil decreases, the corrosivity generally increases. Test results indicate the site soils have minimum electrical resistivity value of 1,300 ohm-centimeters. According to the County of Los Angeles (2013) criteria, the soils are not considered corrosive to buried metals. Our laboratory test results indicate a pH value of 8.

Other criteria may indicate different corrosion potential, and the project team should determine the design criteria. For example, correlations between resistivity and corrosion potential published by the National Association of Corrosion Engineers (NACE) (Roberge, 2018) indicate that the soils are moderately corrosive to buried metals. If the project design is based on the NACE criteria, corrosion protection for metal in contact with site soils should be considered. Corrosion protection may include the use of epoxy or asphalt coatings. A corrosion specialist, during project design, should be consulted regarding appropriate protection for buried metals and suitable types of piping.

7.4. Site Preparation and Earth Work

In general, earthwork should be performed in accordance with the recommendations presented in this report. Twining should be contacted with any questions regarding the recommendations or guidelines presented herein.

7.4.1. Site Preparation

Site preparation should begin with the removal of utility lines, asphalt, concrete, vegetation, and other deleterious debris from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is not present. Clearing and grubbing should extend to the outside edges of the proposed excavation and fill areas. We recommend that unsuitable materials such as organic matter or oversized material be removed and disposed of offsite. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed of at a legal dump site away from the project area.

7.4.2. Over-Excavation and Subgrade Preparation

Excavation for footings of minor structures should extend 2 feet below the bottom of the footings. Excavation for pavement and hardscape should extend 1 foot below the bottom of the pavement section and hardscape section. Laterally, excavation should extend at least two feet beyond the limits of the improvements.

The project geotechnical engineer should be notified to check the bottom of the excavation for consistency, suitability, and compaction. Footing bottoms should be probed manually and tested for relative compaction to achieve at least 95 percent of the maximum dry density as determined by the latest version of ASTM Test Method D1557. If soft soils are encountered at the bottom of excavation for footings, pavement, and hardscape, the geotechnical engineer should provide recommendations for remediation as needed.

Over-excavation should be backfilled with compacted fill in accordance with Sections 6.4 of this report. Prior to placement of any fill at the site, the geotechnical engineer or their representative should review the bottom of the excavation for conformance with the recommendations of this report.

7.4.3. Materials for Fill

On-site soils are generally suitable for use as fill, provided oversized particles are removed. Based on our findings during field exploration and review of the samples collected from the site, we do not anticipate expansive or collapsible soils to be present at the site. We note that materials encountered during our field exploration exhibited moisture contents well above their optimum moisture content. If the ponds are not drained sufficiently in advance to allow onsite soils to dry before construction, the excavated soils will likewise contain moisture levels significantly above optimum. Such soils will require drying prior to being used as fill materials.

Import fill soils, if required, should be free of organic content and not contain contaminated materials, rocks, or lumps over 4 inches in largest dimension, and not more than 40 percent larger than ¾ inch. Utility trench backfill material should not contain rocks or lumps over 3 inches in largest dimension. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces, or may be disposed of offsite.

Any imported fill material should consist of granular soil having a “very low” expansion potential (i.e., expansion index of 20 or less). Import material should also have low corrosion potential (that is, chloride content less than 500 parts per million [ppm], soluble sulfate content of less than 0.1 percent, and pH of 5.5 or higher). Materials to be used as fill should be evaluated by a Twining representative prior to importing or filling.

7.4.4. Compacted Fill

Prior to placement of compacted fill, the contractor should request an evaluation of the exposed excavation bottom by Twining. Unless otherwise recommended, the exposed excavation bottom should be scarified to a minimum depth of 8 to 10 inches and watered or dried, as needed, to achieve generally consistent moisture contents within approximately 2 percent above the optimum moisture content. The scarified materials should then be compacted to at least 95 percent relative compaction in accordance with the latest version of ASTM Test Method D1557.

Compacted fill should be placed in horizontal lifts of approximately 6 to 12 inches prior to compaction. Backfill about structures shall be placed in layers not more than 6" thick prior to compaction. Prior to compaction, each lift should be watered or dried as needed to achieve near optimum moisture condition, mixed, and then compacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other appropriate compacting rollers. Fill materials should generally be compacted to a minimum relative compaction of 90 percent as determined by ASTM D1557, unless indicated otherwise in this report. Successive lifts should be treated in the same manner until the desired finished grades are achieved. The moisture content should be within approximately 2 percent above the optimum moisture content.

7.4.5. Benching

Where existing grades are at a slope steeper than 5:1 (horizontal:vertical) and the height of the fill slope exceeds 5 feet, benching should be provided. A key that is not less than 10 feet in width and 2 feet in depth should be provided at the toe of the slope. The benches should be scarified and recompacted. The scarified benches and new fill placed on the slopes should be moisture-conditioned to approximately 2% above the optimum moisture content and then compacted to at least 95 percent of the maximum dry density as determined by ASTM D1557.

7.4.6. Temporary Excavations

Temporary excavations for the project are expected. We anticipate that unsurcharged excavations with vertical sides less than 4 feet high will generally be stable; however, some sloughing of cohesionless sandy materials encountered at the site should be expected.

Where space is available, temporary, un-surcharged excavation sides over 4 feet in height should be sloped no steeper than an inclination of 1.5H:1V (horizontal:vertical). Where sloped excavations are created, the tops of the slopes should be barricaded so that vehicles and storage loads are away from the top edge of the excavated slopes with a distance at least equal to the height of the slopes. A greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes. Twining should be advised of such heavy vehicle loadings so that specific setback requirements can be established. If the temporary construction slopes are to be maintained during the rainy season, berms are recommended to be graded along the tops of the slopes in order to prevent runoff water from entering the excavation and eroding the slope faces.

Excavations should not undermine existing adjacent footings. Excavations for the proposed improvements should not encroach within a 1:1 plane projected from the bottom edge of existing at-grade or below-grade site facilities including foundations of existing structures, trenches, underground pipelines. Otherwise, slot-cut or shoring should be implemented to maintain foundation support of the adjacent facilities.

Personnel from Twining should observe the excavations so that any necessary modifications based on variations in the soil conditions encountered can be made. All applicable safety requirements and regulations, including CalOSHA requirements, should be met. Stability of temporary excavations is the responsibility of the contractor.

7.4.7. Excavation Bottom Stability

In general, we anticipate that bottoms of excavation will be stable and should provide suitable support for the proposed improvements. If encountered, unstable bottom conditions may be mitigated by over-excavation of the bottom to suitable depths, and/or replacement with a minimum 6- to 12-inch-thick aggregate base. The aggregate base should be compacted in one lift. Recommendations for stabilizing excavation bottoms should be based on evaluation in the field by the geotechnical consultant at the time of construction.

7.4.8. Backfill for Utility Trench

Utility trenches to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement. At locations where the trench bottom is yielding or otherwise unstable, pipe support may be improved by placing a minimum 6 inches of bedding materials described below. Remedial earthwork at the trench bottom should be performed where oversized materials (rocks or clods greater than 3 inches) are present. Removal of oversized materials to a depth of 6 inches below the bottom of the pipeline and replacement with compacted fill. The trenches should be backfilled with bedding materials to at least one foot above the pipe. The bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No void or uncompacted areas should be left beneath the pipe haunches.

The bedding materials may consist of clean sand having a minimum sand equivalent (SE) of 30, gravel or crushed rock, or 2-sack sand-cement slurry, and should meet the specifications provided in the latest edition of the "Greenbook" Standard Specifications for Public Works Construction. Samples of materials proposed for use as bedding material should be provided to the project geotechnical engineer for inspection and testing before the material is imported for use on the project. The onsite materials can only be used following the requirement of "Greenbook" bedding specification when the SE is not less than 30. Gravel or crushed rock if used as bedding materials should be wrapped in nonwoven geotextile fabric.

The remainder of trench backfill may consist of onsite soils and should not contain rocks or lumps over 3 inches in largest dimension. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or may be disposed of offsite. This portion of backfill should be placed in horizontal lifts of approximately 8 to 12 inches prior to compaction. The moisture content should be within approximately 2 percent above the optimum moisture content. However, within the upper 12 inches of subgrade in areas of concrete slabs-on-grade, concrete pavement, and concrete flatwork, trench backfill should not consist of soils with expansion potential greater than 20.

Backfill may be placed and compacted by mechanical means. The bedding materials should be compacted to 90 percent of the laboratory maximum dry density per ASTM Standard D1557 and the remainder trench backfill should be compacted to 95 percent. Within pavement areas, the upper 12 inches of subgrade soils and the overlying aggregate base should be compacted to 95 percent. Jetting or flooding of backfill material is not recommended.

7.4.9. Rippability

The earth materials underlying the site should be generally excavatable with heavy-duty earthwork equipment in good working condition. Some gravels, cobbles and man-made debris should be anticipated within the fill soils.

7.5. Foundation Recommendations for Minor Structures

Based upon the excavation/over-excavation and backfill recommendations, proposed minor structures may be supported on continuous strip footings or isolated footings designed in accordance with the geotechnical recommendations presented below. Structural design of foundations should be performed by the structural engineer and should conform to the 2025 CBC.

7.5.1. Bearing Capacity and Settlement

Footings for minor structures should be placed on the subgrade prepared in accordance with the requirements described in Section 7.4. Geotechnical design parameters for these footings presented in Table 4 may be used.

Table 4 - Geotechnical Design Parameters for Shallow Foundations of Minor Structures

Minimum Footing Dimensions	• Minimum width: 12 inches • Minimum embedment: 12 inches measured from the lowest adjacent grade to the bottom of footing.
Allowable Bearing Pressure	• Footings with the above minimum dimension, an allowable bearing pressure of 2,000 pounds per square foot (psf) may be used. • The allowable bearing values may be increased by one-third for transient live loads from wind or earthquake.
Estimated Static Settlement	• Less than 1 inch of total settlement with differential settlement estimated to be on the order of 0.5 inch over 30 feet (for foundations designed in accordance with this report). • The static settlement of foundation system is expected to occur immediately upon application of loading.
Estimated Seismic Settlement	• Total seismic settlement up to 9 inches. • Differential seismic settlement of 1/2 inch over a horizontal distance of 30 feet.
Allowable Coefficient of Friction Below Footings	0.25
Allowable Lateral Passive Resistance	• Increases with depth at a rate of 150 psf per foot (150 pcf equivalent fluid pressure) to a maximum value of 1,800 psf. • The allowable passive resistance value may be increased by one-third for transient loads such as wind or earthquake loads. • The upper one foot of soil resistance should be neglected when calculating the passive resistance.

7.5.2. Lateral Resistance

The total allowable lateral resistance can be taken as the sum of the friction resistance and passive resistance, provided that the passive resistance does not exceed two-thirds of the total allowable resistance. The passive resistance values may be increased by one-third when considering wind or seismic loading.

7.6. Modulus of Subgrade Reaction

The modulus of subgrade reaction k for design of combined footing or slabs-on-grade supported on at least 1 foot of compacted fill may be obtained from the following equation.

$$\mathrm{K} = \mathrm{k}_1 \left(\frac{B+1}{2B}\right)^2 \left(\frac{2\mathrm{L}+\mathrm{B}}{3\mathrm{L}}\right)$$

where: k_1 = modulus for a 1-foot by 1-foot plate = 150 pounds per cubic inch (pci);
B = width of combined footing or slab in feet; and
L = length of combined footing or slab in feet.

7.7. Concrete Slabs

Over-excavation for concrete slabs-on-grade (SOGs) outside of the building footprint should extend to at least 3 feet from the ground surface to account for potential soil collapse. The over-excavation should be backfilled with engineered fill having a very low expansion potential (i.e., expansion index of 20 or less) compacted to at least 95 percent relative compaction determined according to ASTM D1557. For design of concrete SOGs, a subgrade modulus k value discussed in Section 7.6 may be used.

SOGs should be designed and reinforced in accordance with the structural engineer's recommendations. However, for concrete slabs not supporting heavy loads, we recommend that the slab should have a thickness of at least 5 inches, a 28-day compressive strength of at least 3,000 pounds per square inch (psi), a water-cement ratio of 0.5 or less, and a slump of 4 inches or less. Additional thickness and reinforcement recommendations may be provided by the structural engineer.

Concrete slabs with or without reinforcement will exhibit cracking. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. From the geotechnical point of view, reinforcement in concrete flatwork not supporting heavy loads is not necessary. However, reinforcement may provide benefits to the flatwork's cosmetics by limiting crack widths. On this basis, slabs should be reinforced with at least No. 3 reinforcing bars placed longitudinally at 18 inches on center. The reinforcement should extend through the control joints to reduce the potential for differential movement. Control joints should be constructed in accordance with recommendations from the structural engineer or architect.

In moisture sensitive areas, dampproofing should be installed beneath the slab. Dampproofing should consist of a 15-mil-thick moisture vapor retarder that meets the requirements of ASTM E 1745 Class C (Stego Wrap or similar). The moisture vapor retarder may be placed directly on the subgrade prepared in accordance with Section 7.4.2 of this report. The slab may be placed directly on the moisture vapor retarder. It should be noted that concrete placed in direct contact with a vapor retarder does not lose water at the base and thus does not stiffen as rapidly as concrete placed on a draining base which is able to lose part of its excess water to the base. If rapid surface drying

conditions are present, the surface of concrete placed directly on a vapor retarder will tend to dry and crust over while the concrete below the surface remains relatively less stiff or unhardened. Under such conditions, the slab will have an increased potential to curl, and a reduction in surface flatness and some blistering or delamination can occur as air, water, or both become trapped below the finish surface (ACI302.1R-04).

Care should be taken not to puncture the plastic membrane during placement of the membrane. Joints in the membrane should be lapped and sealed in accordance with the manufacturer's installation instructions.

7.8. Fence Poles, Light Poles and Sign Posts

The project may involve fence poles, light poles and sign posts. Geotechnical recommendations for pole foundations of these structures with and without lateral constraint provided at the ground surface are provided below based on 2025 CBC.

7.8.1. Axial Capacity and Settlement

Axial bearing capacity of pole foundation may be estimated using an allowable unit skin friction f_{all}. The allowable skin friction fall may be estimated using the following equation:

$$f_{all} = 24\ Z\ \beta$$

where $\beta = (1.5 - 0.135\sqrt{Z})$ and $0.25 \le \beta \le 1.2$; Z is depth in feet below ground surface, and f_{all} is allowable unit skin friction in psf at depth Z. The upper one foot of soil should be ignored when calculating the allowable skin friction.

- Uplift capacity: 50% of the allowable axial compressive capacity plus the weight of the pier.
- Anticipated settlement: less than 1/2 inch.

The capacities recommended above include a factor of safety of 2 for skin friction and assume the piers will be spaced no closer than 3D center-to-center. No end-bearing capacity is recommended.

7.8.2. Non-Constrained Ground

The embedment of sign posts where no lateral constraint is provided at or above the ground surface should be calculated using Equation 18-1 of 2025 CBC (shown below) or a minimum 3 feet below the ground surface, whichever is deeper.

$$d = \frac{A}{2}\left(1 + \sqrt{1 + \frac{4.36h}{A}}\right) \quad \text{(Equation 18-1 of 2025 CBC)}$$

where:
A = $2.34P/(S_1 * b)$
b = Diameter of round post or footing or diagonal dimension of square post or footing, feet
d = Depth of embedment in earth in feet but not over 12 feet for purpose of computing lateral pressure.
h = Distance in feet from ground surface to point of application of "P".
P = Applied lateral force in pounds.

S_1 = Allowable lateral soil-bearing pressure based on a depth of one-third the depth of embedment in pounds per square foot.

An allowable passive earth pressure of 150 pcf up to a maximum of 1,800 psf may be used for design provided that the upper 1 foot of passive resistance is neglected in the structural design.

7.8.3. Constrained Ground

The embedment of sign posts where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement, should be calculated using Equation 18-2 of 2025 CBC (shown below) or a minimum 3 feet below the ground surface, whichever is deeper.

$$d = \sqrt{\frac{4.25Ph}{S_3 b}} \qquad \text{(Equation 18-2 of 2025 CBC)}$$

where:
b = Diameter of round post or footing or diagonal dimension of square post or footing, feet
d = Depth of embedment in earth in feet but not over 12 feet for purpose of computing lateral pressure.
h = Distance in feet from ground surface to point of application of "P".
P = Applied lateral force in pounds.
S_3 = Allowable lateral soil-bearing pressure based on a depth of one-third the depth of embedment in pounds per square foot.

An allowable passive earth pressure of 150 pcf up to a maximum of 1,800 psf may be used for design provided that the upper one foot of passive resistance is neglected in the structural design. Pole foundations spaced at least 3 diameters of the maximum pole foundation and the supported elements are not adversely affected by a ½-inch motion at the ground surface due to short-term lateral loads may be designed using lateral bearing pressures equal to 2 times the allowable passive pressure.

7.9. Drainage Control

The control of surface water is essential to the satisfactory performance of the site improvements. Surface water should be controlled so that conditions of uniform moisture are maintained beneath the improvements, even during periods of heavy rainfall. The following recommendations are considered minimal:

- Ponding and areas of low flow gradients should be avoided.
- If bare soil within 5 feet of proposed structures is not avoidable, then a gradient of 5 percent or more should be provided sloping away from the structures. Corresponding paved surfaces should be provided with a gradient of at least 1 percent.
- The remainder of the unpaved areas should be provided with a drainage gradient of at least 2 percent.
- Positive drainage devices, such as graded swales, paved ditches, and/or catch basins should be employed to accumulate and to convey water to appropriate discharge points.
- Concrete walks and flatwork should not obstruct the free flow of surface water.
- Brick flatwork should be sealed by mortar or be placed over an impermeable membrane.
- Area drains should be recessed below grade to allow free flow of water into the basin.
- Enclosed raised planters should be sealed at the bottom and provided with an ample flow gradient to a drainage device. Recessed planters and landscaped areas should be provided with area inlet and subsurface drain pipes.

- Planters should not be located adjacent to the structures wherever possible. If planters are to be located adjacent to the structures, the planters should be positively sealed, should incorporate a subdrain, and should be provided with free discharge capacity to a drainage device.
- Planting areas at grade should be provided with positive drainage. Wherever possible, the grade of exposed soil areas should be established above adjacent paved grades. Drainage devices and curbing should be provided to prevent runoff from adjacent pavement or walks into planted areas.
- Gutter and downspout systems should be provided to capture discharge from roof areas. The accumulated roof water should be conveyed to off-site disposal areas by a pipe or concrete swale system.

Landscape watering should be performed judiciously to preclude either soaking or desiccation of soils. The watering should be such that it just sustains plant growth without excessive watering. Sprinkler systems should be checked periodically to detect leakage and they should be turned off.

8. DESIGN REVIEW AND CONSTRUCTION MONITORING

Geotechnical review of plans and specifications is of paramount importance in engineering practice. The poor performance of many projects has been attributed to inadequate geotechnical review of construction documents. Additionally, observation and testing of the subgrade will be important to the performance of the proposed development. The following sections present our recommendations relative to the review of construction documents and the monitoring of construction activities.

8.1. Plans and Specifications

The design plans and specifications should be reviewed by Twining, Inc. prior to bidding and construction, as the geotechnical recommendations may need to be reevaluated in the light of the actual design configuration and loading conditions. This review is necessary to evaluate whether the recommendations contained in this report and future reports have been properly incorporated into the project plans and specifications. Based on the work already performed, Twining is best qualified to provide such review.

8.2. Construction Monitoring

Site preparation, removal of unsuitable soils, assessment of imported fill materials, fill placement, foundation installation, and other site grading operations should be observed and tested, as appropriate. The substrata exposed during the construction may differ from that encountered in the test excavations. Continuous observation by a representative of Twining, Inc. during construction allows for evaluation of the soil conditions as they are encountered and allows the opportunity to recommend appropriate revisions where necessary.

9. LIMITATIONS

The recommendations and opinions expressed in this report are based on Twining's review of available background documents, on information obtained from field explorations, and on laboratory testing. It should be noted that this study did not evaluate the possible presence of hazardous materials on any portion of the site. In the event that any of our recommendations conflict with recommendations provided by other design professionals, we should be contacted to aid in resolving the discrepancy.

Due to the limited nature of our field explorations, conditions not observed and described in this report may be present on the site. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation and laboratory testing can be performed upon request. It should be understood that conditions different from those anticipated in this report may be encountered during grading operations, for example, the extent of removal of unsuitable soil, and that additional effort may be required to mitigate them.

Site conditions, including groundwater elevation, can change with time as a result of natural processes or the activities of man at the subject site or at nearby sites. Changes to the applicable laws, regulations, codes, and standards of practice may occur as a result of government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Twining, Inc. has no control.

Twining's recommendations for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the recommendations are made contingent upon the opportunity for Twining to observe grading operations and foundation excavations for the proposed construction. If parties other than Twining are engaged to provide such services, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the recommendations in this report and/or by providing alternative recommendations.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Twining should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report has been prepared for the exclusive use by the client and its agents for specific application to the proposed project. Land use, site conditions, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of this report and the nature of the new project, Twining may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Twining from any liability resulting from the use of this report by any unauthorized party.

Twining performed its evaluation using the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical professionals with experience in this area in similar soil conditions. No other warranty, either express or implied, is made as to the conclusions and recommendations contained in this report.

10. SELECTED REFERENCES

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TWINING
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Riverside CA 92501
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FIGURES



N

APPROXIMATE LOCATION OF PROJECT

SCALE IN FEET

0 2000 4000

REFERENCE: USGS (2022)

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SITE LOCATION MAP

ALESSANDRO PONDS OPTIMIZATION PHASE II
EASTERN MUNICIPAL WATER DISTRICT
SAN JACINTO, CA

PROJECT NO.	REPORT DATE	FIGURE
260029.3	May 2026	FIGURE 1



0 250 500

NOTE: ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE

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REFERENCE: GOOGLE EARTH (2025)

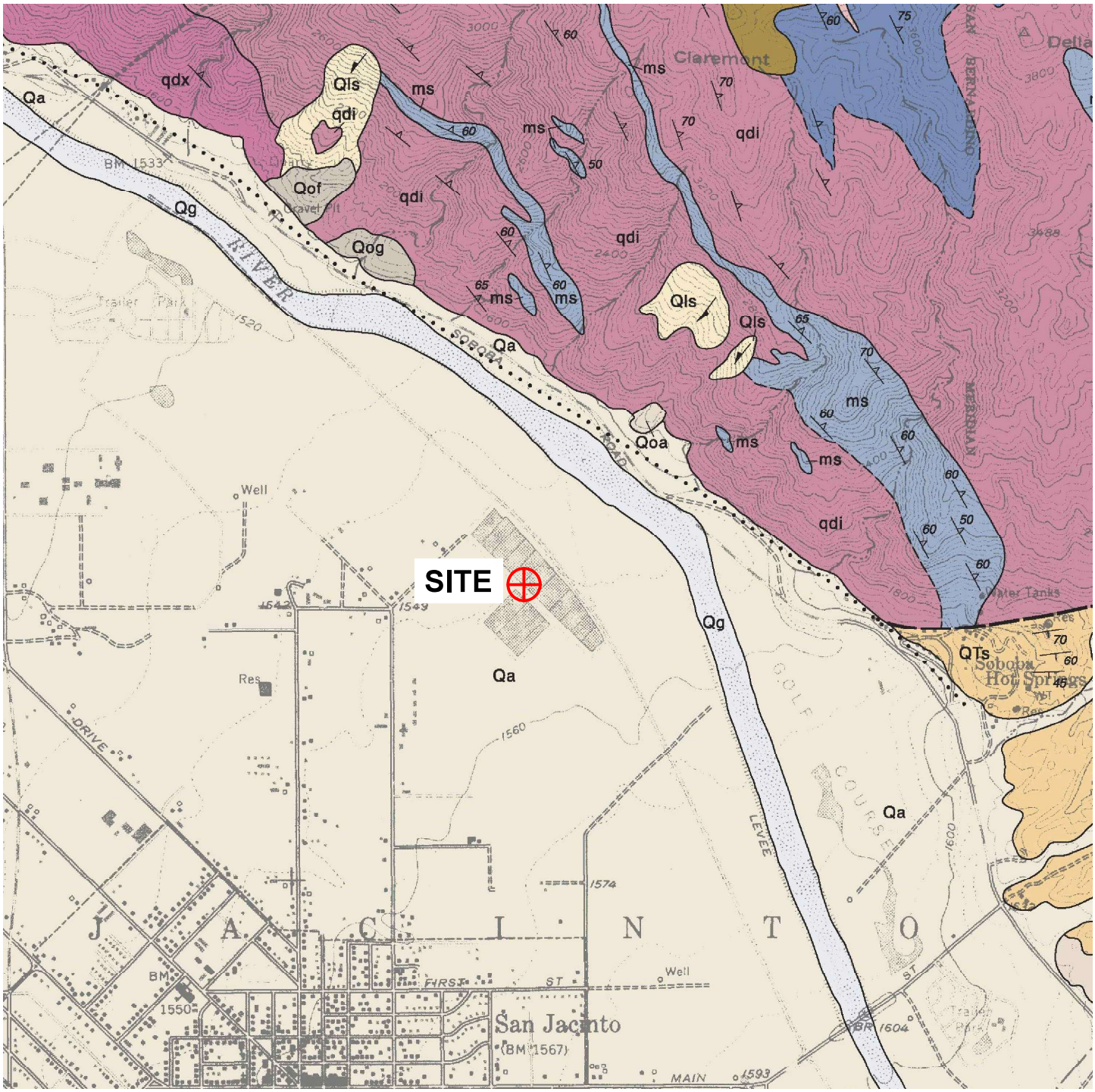
LEGEND

B-1 TD=50'	APPROXIMATE LOCATION OF MONITORING WELL TOTAL DEPTH IN FEET
B-2 TD=16.5'	APPROXIMATE LOCATION OF HOLLOW-STEM AUGER BORING TOTAL DEPTH IN FEET
B-7 TD=9'	APPROXIMATE LOCATION OF HAND AUGER TOTAL DEPTH IN FEET

BORING LOCATION MAP

ALESSANDRO PONDS OPTIMIZATION PHASE II
EASTERN MUNICIPAL WATER DISTRICT
SAN JACINTO, CA

PROJECT No.	REPORT DATE	FIGURE
260029.3	May 2026	FIGURE 2



LEGEND

Qa Alluvial sand and clay of valley areas

Qg Alluvial sand and gravel of major stream channels

qdi Quartz diorite

APPROXIMATE SCALE IN FEET

0 2000 4000

REFERENCE: DIBBLEE (2003)

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GEOLOGIC MAP

ALESSANDRO PONDS OPTIMAZATION PHASE II
EASTERN MUNICIPAL WATER DISTRICT
SAN JACINTO, CA

PROJECT NO.	REPORT DATE	FIGURE
260092.3	May 2026	FIGURE 3

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APPENDIX A

FIELD EXPLORATION

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Appendix A
Field Exploration

General

The field exploration was conducted between March 7 and March 8, 2026, and consisted of drilling, testing, sampling, and logging 7 exploratory borings (B-1 through B-7). Borings B-1 through B-5 were drilled using CME-75 truck-mounted drill rig equipped with 8-inch-diameter hollow-stem auger (has). Drilling operation for the HSA borings was performed by Baja Exploration of Escondido, California using a CME-95 truck-mounted drill rigs equipped with 8-inch diameter HSA. The remainder of the borings were advanced using a 5-inch-diameter hand auger. The borings were advanced to approximately 6.5 to 50 feet below the existing ground surface (bgs). The approximate locations of the borings are shown on Figure 2 – Site Plan and Boring Location Map.

Driven samples of the subsurface materials were obtained from the borings using a Standard Penetration Test (SPT) sampler designed with room for liner but liners were not used and a modified California split spoon sampler. The samplers were driven using a 140-pound automatic hammer falling approximately 30 inches. The blow-counts to drive the samplers were recorded, and subsurface conditions encountered in the borings were logged by a Twining geologist. Samples obtained from the borings were transported to Twining's geotechnical engineering laboratory for examination and testing.

Borings B-1, B-3, and B-5, were converted to monitoring wells at the completion of drilling. For the other borings, upon completion of drilling, sampling and testing, the borings deeper than 5 feet were backfilled by the drilling subcontractor using neat cement grout and the surface patched with topsoil. The shallower borings were backfilled with cuttings and the surface patched to match existing conditions.

UNIFIED SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

COARSE-GRAINED SOILS

Relative Density	SPT (blows/ft)	Relative Density (%)
Very Loose	<4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	>50	85 - 100

FINE-GRAINED SOILS

Consistency	SPT (blows/ft)
Very Soft	<2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

NOTE: SPT blow counts based on 140 lb. hammer falling 30 inches

Sample Symbol	Sample Type	Description
	California Modified	2.4 in. I.D., 3.0 in. O.D. driven sampler
	SPT	1.4 in I.D., 2.0 in. O.D. driven sampler
	Bulk	Retrieved from soil cuttings
	Thin-Walled Tube	Pitcher or Shelby Tube

LABORATORY TESTING ABBREVIATIONS

ATT	Atterberg Limits
C	Consolidation
CORR	Corrosivity Series
DS	Direct Shear
EI	Expansion Index
GS	Grain Size Distribution
K	Permeability
MAX	Moisture/Density (Modified Proctor)
O	Organic Content
RV	Resistance Value
SE	Sand Equivalent
SG	Specific Gravity
TX	Triaxial Compression
UC	Unconfined Compression

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EXPLANATION FOR LOG OF BORINGS

Twining, Inc.
4811 Airport Plaza Dr Suite 220
Long Beach, CA 90815

TWINING

Alessandro Ponds

San Jacinto, CA

B-1

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 9.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	JAB	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1545'	
Hammer Type:	Auto	Latitude, Longitude:	33.804501, -116.950825	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	9.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
0					SM	**Artificial Fill**: (SM) Silty SAND, light brown, slightly moist, fine to coarse sand, trace fine subangular gravel				
						Alluvium: (SM) Silty SAND, grayish brown, moist, fine to coarse sand			21.7	
						-- small sandy silt lens				
5		X	4 4 5			-- loose				
▽										
10		▲	5 7 8		SP-SM	(SP-SM) Poorly Graded SAND with Silt, loose, grayish brown, wet	19.8	99.9		
15		X	2 4 7		SM	(SM) Silty SAND, medium dense, dark grayish brown, wet, fine to medium sand			25.6	NP
20		▲	7 14 21		SP	(SP) Poorly Graded SAND, medium dense, grayish brown, wet, fine to coarse sand	13.8	113.9		
25		X	5 7 8			-- medium dense			4.8	
30		▲	7 9 10			-- no sample recovery				

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Alessandro Ponds

San Jacinto, CA

B-1

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 9.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	JAB	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1545'	
Hammer Type:	Auto	Latitude, Longitude:	33.804501, -116.950825	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	9.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
35		X	7 14 30		SP					
					SM	(SM) Silty SAND, dense, gray, moist to wet, fine to medium sand				
40		▲	8 15 25			-- dense, dark gray, moist to wet	20.9	104.3		
45		X	5 11 18			-- medium dense, less silt				
50		▲	10 10 26		SC	(SC) Clayey SAND, medium dense, dark gray, moist to wet, fine to medium sand, some black clay lenses	24.0	103.8		
55										
60										

TWINING

Alessandro Ponds

San Jacinto, CA

B-2

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater encountered at approximately 10 feet.- Backfilled with cuttings.
Logged By:	JO	Date Drilled:	04/08/2026	
Checked By:	JAB	Boring Depth:	16.5'	
Equipment:	CME-95	Boring Elevation:	1548'	
Hammer Type:	Auto	Latitude, Longitude:	33.803532, -116.949639	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	10 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
					SM	**Artificial Fill**: (SM) Silty SAND, dark brown, slightly moist				
5		X	3 3 2		ML	**Alluvium**: (ML) Sandy SILT, medium stiff, dark brown, moist, mostly fine sand			52.0	
▽ 10		▲	8 6 4		SM	(SM) Silty SAND, loose, dark brown, wet	20.7	98.2		
15		X	6 4 7			-- medium dense, wet, fine to medium sand				
20										
25										
30										

TWINING

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San Jacinto, CA

B-3

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 11.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	JAB	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1551'	
Hammer Type:	Auto	Latitude, Longitude:	33.8026, -116.948503	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	11.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
	■				SM	**Artificial Fill**: (SM) Silty SAND, dark brown, moist, fine to coarse sand, some fine gravel				
						-- becomes dark gray				
5		▲	7 12 13			**Alluvium**: (SM) Silty SAND, medium dense, grayish dark brown, moist, fine to coarse sand	15.8	107.6		
10 ▽		⊠	2 2 2			-- loose, becomes gray, wet			41.9	
15		▲	2 6 7			-- loose, dark grayish brown	17.7	109.7		
20		⊠	6 10 14			-- medium dense, dark grayish brown, wet, fine to medium sand			45.1	NP
25		▲	10 12 21			-- medium dense, fine to coarse sand	21.6	108.6		
30		⊠	5 8 12			-- medium dense				

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San Jacinto, CA

B-3

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 11.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	JAB	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1551'	
Hammer Type:	Auto	Latitude, Longitude:	33.8026, -116.948503	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	11.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
					SM					
35		▲	10 18 27		SP-SM	(SP-SM) Poorly Graded SAND with Silt, medium dense, grayish brown, wet, fine to medium sand	18.0	110.0		
40		⊠	8 10 12		SM	(SM) Silty SAND, medium dense, dark grayish brown, wet, fine to medium sand			30.8	
45		▲	10 11 19			-- medium dense, dark gray, some lenses of sandy silt	27.1	96.9		
		⊠	10 20 26		SC	(SC) Clayey SAND, medium dense, dark grayish brown, moist to wet, some black clay lenses				
50										
55										
60										

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San Jacinto, CA

B-4

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater encountered at approximately 10 feet. Backfilled with cuttings.
Logged By:	JO	Date Drilled:	04/08/2026	
Checked By:	JAB	Boring Depth:	16.5'	
Equipment:	CME-95	Boring Elevation:	1553'	
Hammer Type:	Auto	Latitude, Longitude:	33.801346, -116.946862	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	10 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
					SM	Approximately 6 inches of aggregate base **Artificial Fill**: (SM) Silty SAND, dark brown, slightly moist				
						Alluvium: (SM) Silty SAND, medium brown, moist, mostly fine sand				
5		▲	3 6 8			-- loose, slightly moist	5.0	115.0		
▽ 10		☒	3 5 4			-- loose, dark brown, wet				
15		▲	2 2 4			-- loose, wet	27.4	88.5		
20										
25										
30										

TWINING

Alessandro Ponds

San Jacinto, CA

B-5

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 24.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	DHC	Date Drilled:	04/08/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1557'	
Hammer Type:	Auto	Latitude, Longitude:	33.800493, -116.945804	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	24.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
0					SM	**Artificial Fill**: (SM) Silty SAND, medium brown, slightly moist				
					SP-SM	(SP-SM) Poorly Graded SAND with Silt, light grayish brown, slightly moist, fine to coarse sand			22.0	
					SM	**Alluvium**: (SM) Silty SAND, medium brown, moist, fine to medium sand				
5		X	2 2 4			-- loose, light grayish brown, fine to coarse sand, some fine gravel				
10		▲	5 8 12		SP-SM	(SP-SM) Poorly Graded SAND with Silt, medium dense, light gray with some black grains, dry, fine to coarse sand	1.7	101.8		
15		X	4 4 5		SM	(SM) Silty SAND, loose, dark brown, moist, fine to medium sand				
20		▲	8 12 19		SP-SM	(SP-SM) Poorly Graded SAND with Silt, medium dense, grayish brown, slightly moist, fine to coarse sand	4.3	99.0	7.6	
▽										
25		X	8 10 13		SM	(SM) Silty SAND, medium dense, gray, wet, mostly fine to medium sand, some coarse sand, trace clay				
30		▲	5 7 12			-- medium dense, dark grayish brown, wet, fine to medium sand	21.1	105.7	48.6	NP

TWINING

Alessandro Ponds

San Jacinto, CA

B-5

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater measured at 24.3 feet on 4/8/26. Converted to monitoring well.
Logged By:	DHC	Date Drilled:	04/08/2026	
Checked By:	JAB	Boring Depth:	50'	
Equipment:	CME-95	Boring Elevation:	1557'	
Hammer Type:	Auto	Latitude, Longitude:	33.800493, -116.945804	
Drilling Method:	Hollow-stem Auger	▽ Water Level At Time Of Drilling	24.3 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
					SM					
35		X	7 12 24		SP-SM	(SP-SM) Poorly Graded SAND with Silt, dense, light to medium gray, wet, fine to coarse sand				
40		▲	9 18 15		SM	(SM) Silty SAND, medium dense, dark gray, wet, mostly fine to medium sand, some coarse sand	14.9	116.1		
45		X	10 13 14			-- medium dense, mostly fine sand with some medium sand				
		▲	24 50/6"			-- very dense	18.9	113.2		
50										
55										
60										

TWINING

Alessandro Ponds

San Jacinto, CA

B-6

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater encountered at approximately 6.5 feet. Backfilled with cuttings.
Logged By:	DHC	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	6.5'	
Equipment:	5-inch-diameter hand auger	Boring Elevation:	1541'	
Hammer Type:	N/A	Latitude, Longitude:	33.802309, -116.947101	
Drilling Method:	5-inch-diameter hand auger	▽ Water Level At Time Of Drilling	6.5 ft	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
					SM	**Alluvium**: (SM) Silty SAND, light brown, dry to slightly moist, fine to coarse sand				
						-- increased silt, moist	29.6		42.1	
5						-- decreased silt	27.9			
					SP-SM	(SP-SM) Poorly Graded SAND with Silt, light brown, moist				
▽					SM	(SM) Silty SAND, dark brown, wet, fine to coarse sand				

TWINING

Alessandro Ponds

San Jacinto, CA

B-7

Drilling Co.:	Baja Exploration	Project No.:	260029.3	Comments: Groundwater not encountered. Backfilled with cuttings.
Logged By:	DHC	Date Drilled:	04/07/2026	
Checked By:	JAB	Boring Depth:	9'	
Equipment:	5-inch-diameter hand auger	Boring Elevation:	1546'	
Hammer Type:	N/A	Latitude, Longitude:	33.801073, -116.945932	
Drilling Method:	5-inch-diameter hand auger	▽ Water Level At Time Of Drilling	N/A	
		Cave-in At Time Of Drilling	N/A	

Depth (ft)	Samples: Bulk / Grab	Samples: Driven	Samples: Blow Counts/6"	Graphic Log	USCS	Visual Classification and Remarks	Lab Results: Moisture Content (%)	Lab Results: Dry Density (PCF)	Lab Results: % Fines	Lab Results: Atterberg Limits (LL-PL-PI)
						Topsoil: Approximately 6 inches of topsoil with organics				
					SM	**Alluvium**: (SM) Silty SAND, light brown, dry, fine to coarse sand				
						-- mostly fine sand				
						-- still dry	3.3		32.2	
						-- fine to coarse sand				
5						-- becomes slightly moist				
						-- moist, becomes dark brown				

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APPENDIX B

LABORATORY TESTING

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Appendix B
Laboratory Testing

Laboratory Moisture Content and Density Tests

The moisture content and dry densities of selected driven samples obtained from the exploratory borings were evaluated in general accordance with the latest version of ASTM D 2937. The results are shown on the boring logs in Appendix A, and also summarized in Table B-1.

No. 200 Wash Sieve

The amount of fines passing the No. 200 sieve was evaluated in accordance with ASTM D 1140 on selected samples. The results are summarized on Table B-2.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results are summarized in Table B-3.

Maximum Density and Optimum Moisture

Modified Proctor testing was performed on a select bulk sample of near-surface soils to determine the maximum dry density and optimum water content for compaction. The tests were performed in accordance with ASTM D 1557. The results are attached to this appendix.

Consolidation

Consolidation tests were performed on select modified-California soil samples in general accordance with the latest version of ASTM D2435. The samples were inundated during testing to represent adverse field conditions. The percent consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are attached below.

Direct Shear

Direct shear tests were performed on representative soil samples in general accordance with the latest version of ASTM D 3080 to evaluate the shear strength characteristics of the selected materials. The samples were inundated during shearing to represent adverse field conditions. Test results are attached below.

Corrosivity

Soil pH and resistivity tests were performed by Anaheim Test Lab, Inc. (ATLI) of Anaheim, California on representative soil samples. The resistivity of the soil assumes saturated soil conditions. The chloride and sulfate contents of the selected samples were evaluated in general accordance with the latest versions of Caltrans test methods CT417, CT422, and CT 643. The test results are presented on Table B-4 and the ATLI report included in this appendix.

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Table B-1
Moisture Content and Dry Density

Boring No.	Depth (feet)	Moisture Content (%)	Dry Density (pcf)
B-1	10	19.8	99.9
B-1	20	13.8	113.9
B-1	40	20.9	104.3
B-1	50	24.0	103.8
B-2	10	20.7	98.2
B-3	5	15.8	107.6
B-3	15	17.7	109.7
B-3	25	21.6	108.6
B-3	35	18.0	110.0
B-3	45	27.1	96.9
B-4	5	5.0	115.0
B-4	15	27.4	88.5
B-5	10	1.7	101.8
B-5	20	4.3	99.0
B-5	30	21.1	105.7
B-5	40	14.9	116.1
B-5	50	18.9	113.2
B-6	3	29.6	Bulk Sample
B-6	5	27.9	Bulk Sample
B-7	3	3.3	Bulk Sample

Table B-2
No. 200 Wash Sieve Results

Boring No.	Depth (feet)	Percent Passing #200
B-1	1-5' BULK	21.7
B-1	15	25.6
B-1	25	4.8
B-2	5	52.0
B-3	10	41.9
B-3	20	45.1
B-3	40	30.8
B-5	1-5' BULK	22.0
B-5	20	7.6
B-5	30	48.6
B-6	3	42.1
B-7	3	32.2

Table B-3

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Atterberg Limits Results

Boring No.	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	U.S.C.S. Classification
B-1	15	NP	NP	NP	Silty Sand (SM)
B-3	20	NP	NP	NP	Silty Sand (SM)
B-5	30	NP	NP	NP	Silty Sand (SM)

Table B-4
Corrosivity Test Results

Boring No.	Depth (feet)	pH	Water Soluble Sulfate (ppm)	Water Soluble Chloride (ppm)	Minimum Resistivity (ohm-cm)
B-1	1-5' BULK	8.0	179	338	1,300

Twining, Inc.- Long Beach Lab
3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355
Fax: 562.426.6424
www.twininginc.com

Direct Shear Test Report

Report No: MAT:W01-26-09091
Printed Date: 5/14/2026 **Issue No:** 1

Customer:	Eastern Municipal Water District	**Project No:**	260029.3
		Permit No:	
		OSHPD:	
Project:	Alessandro Ponds Optimization Phase II	**DSA File #:**	
		DSA AP #:	
Jurisdiction:			
Distribution List:		**Approved by:**	Doug Crayton, Sr. Staff Engineer

Sample Details

Sampled By:	Twining	**Date Received:**	4/9/2026
Date Sampled:	4/7/2026	**Received By:**	Twining, Inc.
Sample Location:	B-1	**Material Description:**	SP-SM
Sample Depth:	10 feet	**Source:**	
Sampling Method:	MC	**Test Method:**	ASTM D3080

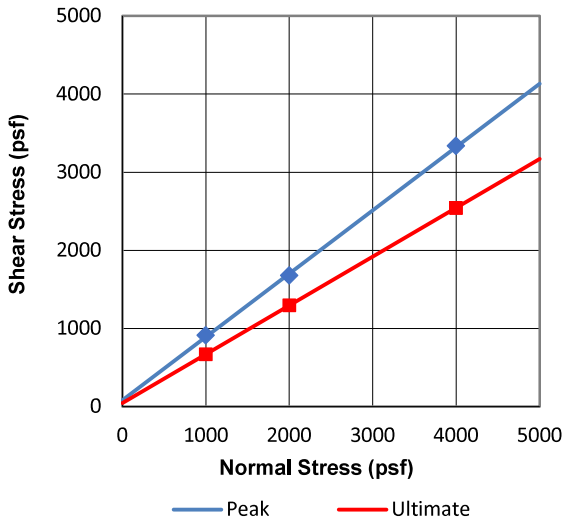
Test Details

Preparation:	Ring	**% Compaction:**		**Shear Rate:**	Slow: .005 (in/min)
Tested By:	BV/KH	**Date Tested:**	4/17/2026		

Specimen #	Wet Density (pcf)	Dry Density (pcf)	Initial Moisture (%)	Final Moisture (%)
1	119.7	99.9	19.8	24.1
2	119.7	99.9	19.8	22.9
3	119.7	99.9	19.8	22.0

Specimen #	Load (psf)	Peak (psf)	Ultimate (psf)
1	1000	912	672
2	2000	1680	1296
3	4000	3336	2544

	Peak	Ultimate
Friction Angle (degrees):	39	32
Cohesion, C (psf):	84	48



Compliance:

Comments

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Fax: 562.426.6424
www.twininginc.com

Direct Shear Test Report

Report No: MAT:W01-26-09091
Printed Date: 5/14/2026 **Issue No:** 1

Customer:	Eastern Municipal Water District	**Project No:**	260029.3
		Permit No:	
		OSHPD:	
Project:	Alessandro Ponds Optimization Phase II	**DSA File #:**	
		DSA AP #:	
Jurisdiction:			
Distribution List:		**Approved by:**	Doug Crayton, Sr. Staff Engineer

Sample Details

Sampled By:	Twining	**Date Received:**	4/9/2026
Date Sampled:	4/7/2026	**Received By:**	Twining, Inc.
Sample Location:	B-3	**Material Description:**	SM
Sample Depth:	5 feet	**Source:**	
Sampling Method:	MC	**Test Method:**	ASTM D3080

Test Details

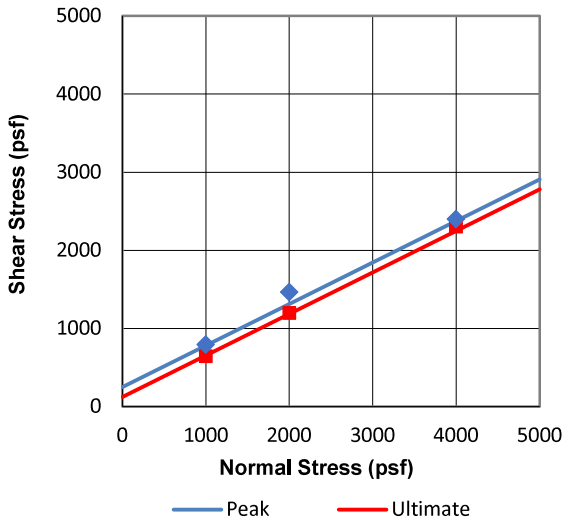
Preparation: Ring **% Compaction:** **Shear Rate:** Slow: .005 (in/min)

Tested By: BV/KH **Date Tested:** 4/21/2026

Specimen #	Wet Density (pcf)	Dry Density (pcf)	Initial Moisture (%)	Final Moisture (%)
1	124.6	107.6	15.8	22.2
2	124.6	107.6	15.8	21.2
3	124.6	107.6	15.8	19.5

Specimen #	Load (psf)	Peak (psf)	Ultimate (psf)
1	1000	792	648
2	2000	1464	1200
3	4000	2400	2304

	Peak	Ultimate
Friction Angle (degrees):	28	28
Cohesion, C (psf):	250	125



Compliance:

Comments

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Fax: 562.426.6424
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Direct Shear Test Report

Report No: MAT:W01-26-09091
Printed Date: 5/14/2026 **Issue No: 1**

Customer:	Eastern Municipal Water District	**Project No:**	260029.3
		Permit No:	
		OSHPD:	
Project:	Alessandro Ponds Optimization Phase II	**DSA File #:**	
		DSA AP #:	
Jurisdiction:			
Distribution List:		**Approved by:**	Doug Crayton, Sr. Staff Engineer

Sample Details

Sampled By:	Twining	**Date Received:**	4/9/2026
Date Sampled:	4/8/2026	**Received By:**	Twining, Inc.
Sample Location:	B-5	**Material Description:**	SP-SM
Sample Depth:	20 feet	**Source:**	
Sampling Method:	MC	**Test Method:**	ASTM D3080

Test Details

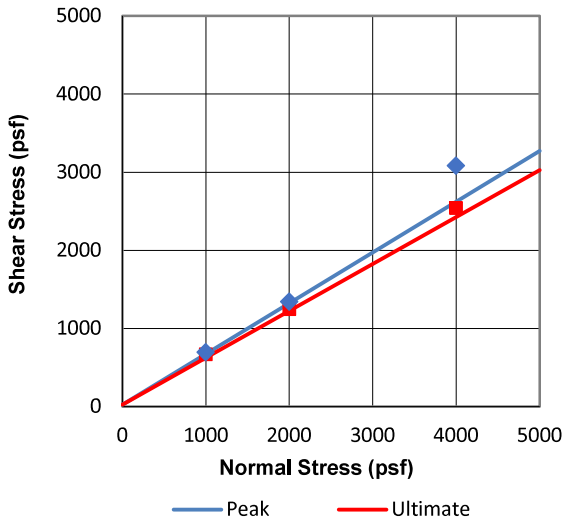
Preparation: Ring **% Compaction:** **Shear Rate:** Slow: .005 (in/min)

Tested By: BV/KH **Date Tested:** 4/20/2026

Specimen #	Wet Density (pcf)	Dry Density (pcf)	Initial Moisture (%)	Final Moisture (%)
1	103.3	99.0	4.3	24.1
2	103.3	99.0	4.3	26.0
3	103.3	99.0	4.3	21.4

Specimen #	Load (psf)	Peak (psf)	Ultimate (psf)
1	1000	696	672
2	2000	1344	1248
3	4000	3084	2544

	Peak	Ultimate
Friction Angle (degrees):	33	31
Cohesion, C (psf):	25	25



Compliance:

Comments

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Direct Shear Test Report

Report No: MAT:W01-26-09091
Printed Date: 5/14/2026 **Issue No:** 1

Customer:	Eastern Municipal Water District	**Project No:**	260029.3
		Permit No:	
		OSHPD:	
Project:	Alessandro Ponds Optimization Phase II	**DSA File #:**	
		DSA AP #:	
Jurisdiction:			
Distribution List:			

Approved by: Doug Crayton
Sr. Staff Engineer

Sample Details

Sampled By:	Twining	**Date Received:**	4/9/2026
Date Sampled:	4/7/2026	**Received By:**	Twining, Inc.
Sample Location:	B-3	**Material Description:**	SM
Sample Depth:	1-5'	**Source:**	
Sampling Method:	BULK	**Test Method:**	ASTM D3080

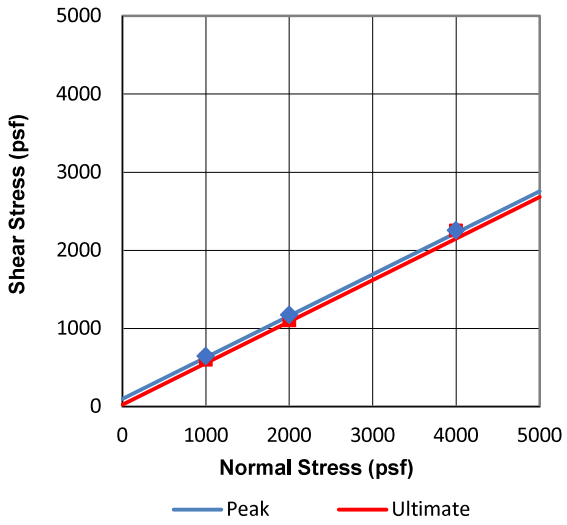
Test Details

Preparation:	Ring	**% Compaction:**	90%	**Shear Rate:**	Slow: .005 (in/min)
Tested By:	BV/KH	**Date Tested:**	4/20/2026		

Specimen #	Wet Density (pcf)	Dry Density (pcf)	Initial Moisture (%)	Final Moisture (%)
1	121.5	110.6	9.9	17.6
2	121.5	110.6	9.9	17.3
3	121.5	110.6	9.9	16.5

Specimen #	Load (psf)	Peak (psf)	Ultimate (psf)
1	1000	648	600
2	2000	1176	1104
3	4000	2256	2256

	Peak	Ultimate
Friction Angle (degrees):	28	28
Cohesion, C (psf):	100	25



Compliance:

Comments

Sample remolded to 90% relative compaction.

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Consolidation Test Report

Report No: MAT:W02-26-01579
Printed Date: 5/14/2026 **Issue No:** 1

Customer: Eastern Municipal Water District
Project: Alessandro Ponds Optimization Phase II

Project No: 260029.3
Permit No:
OSHPD:
DSA File #:
DSA AP #:

Distribution List:

Reviewed by: Doug Crayton
Sr. Staff Engineer

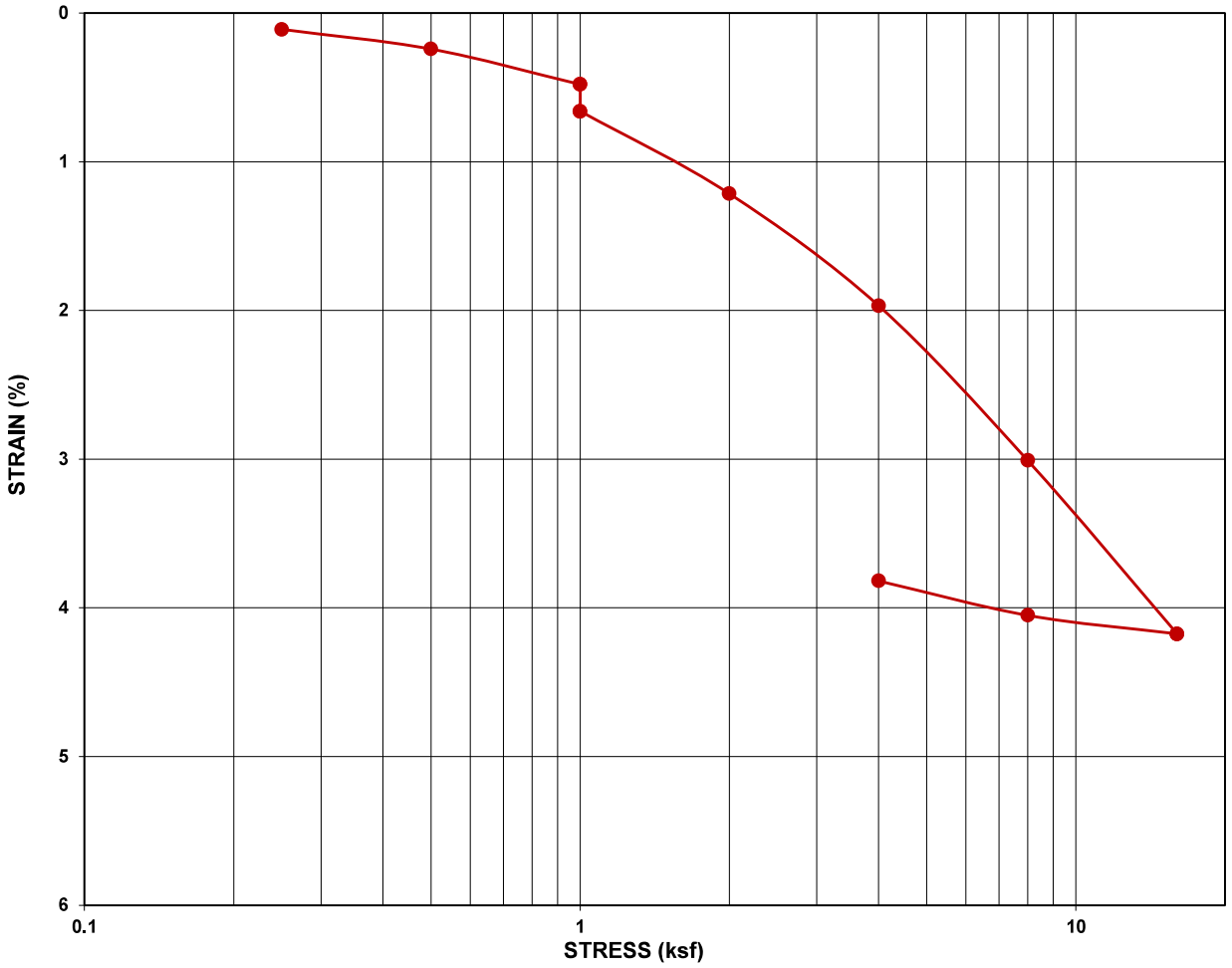
Sample Details

Sampled By: Twining
Date Sampled: 4/8/2026
Sample Location: B-5
Sample Depth: 10 feet
Sample Source:

Date Received: 4/9/2026
Received By: Twining Long Beach Lab
Sample Description: SP-SM
Dry Density (pcf): 101.8
Moisture Content (%): 1.7

Test Details

Test Method: ASTM D 2435 **Date Tested:** 4/20/2026 **Tested By:** R. Powney



Comments:
Water added at 1000 psf.

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Proctor Report

Report No: PTR:W01-26-09091-S01
Date of Issue: 5/14/2026 **Issue No: 1**

Customer: Eastern Municipal Water District
2270 Trumble Road
Perris, CA, 92570

Project: EMWD – Alessandro Ponds Geotech
Alessandro Ave N and W Ramona Expy
San Jacinto, CA,

Project No.: 260029.3
Permit No.:
HCAI:
DSA File #:
DSA AP #:

Jurisdiction:
Distribution:

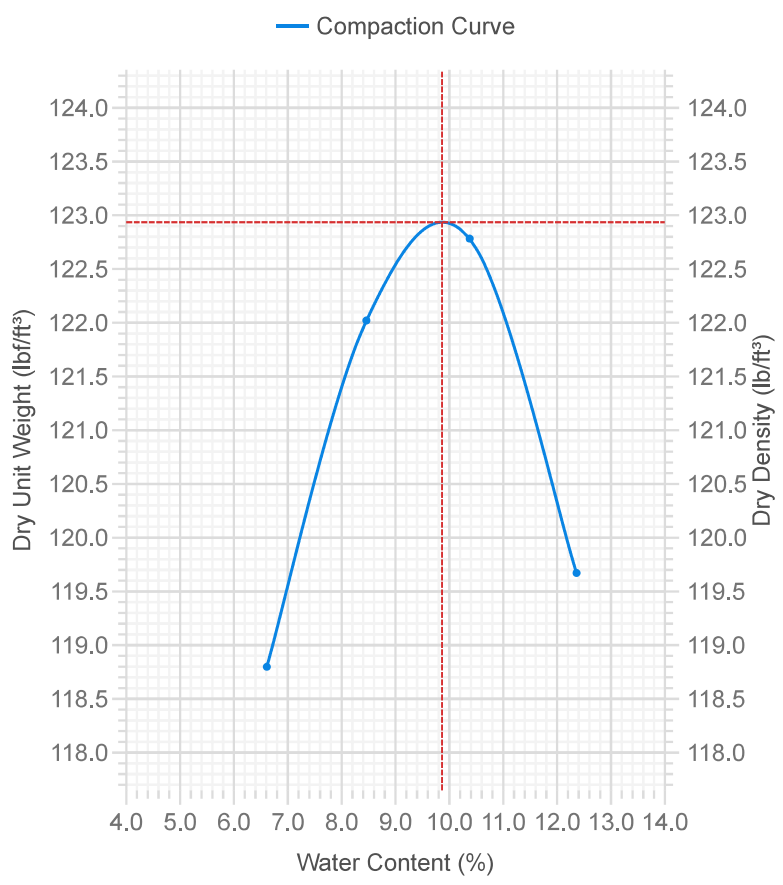
Twining utilizes the "Binary Statement for Simple Acceptance Rule" (ILAC G8:09/2019) for statements of conformity.

Approved Signatory: Douglas Crayton (Staff Engineer)

Sample Details

Sample ID:	W01-26-09091-S01	**Field Sample ID:**	
Date Sampled:	4/7/2026	**Sampled By:**	Douglas Crayton
Source:			
Material:			
Specification:			
Sampling Method:			
Sampling Location:	B-3 1-5' BULK		
Sampling Depth:		**Material Description:**	Silty SAND
Tested By:	Bryson Hayes	**Date Tested:**	4/20/2026

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D1557

Mod. Maximum Dry Unit Weight (lbf/ft³):	**122.9**
Mod. Optimum Water Content (%):	**9.9**
Retained on No.4 Sieve (%):	1
Passing No.4 Sieve (%):	99
Method:	A
Preparation Method:	Moist
Rammer Type:	Automatic
Determined By:	Estimated
Tested By:	Bryson Hayes
Date Tested:	4/20/2026

Remarks:

The Material Tested ☑ Complies ☐ Does Not Comply
With the Project Requirements

Results relate only to the items tested/inspected. All reports remain the property of Twining. This report shall not be reproduced, except in full, without our prior written approval.

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ANAHEIM TEST LAB, INC.

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TWINING LABS
3310 AIRPORT WAY
LONG BEACH, CA 90806

DATE: 4/22/2026

P.O. NO.: Soils04162026

LAB NO.: C-9677

SPECIFICATION: CTM-643/417/422

MATERIAL: Soil

Project No.: 260029.3
Project: EMWD Alessandro Ponds
WO No.: W01-26-09091
Sample ID: B-1 @ 1-5' (Bulk)
Sample Date: 4/7/2026

ANALYTICAL REPORT

CORROSION SERIES
SUMMARY OF DATA

pH	MIN. RESISTIVITY per CT. 643 ohm-cm	SOLUBLE SULFATES per CT. 417 ppm	SOLUBLE CHLORIDES per CT. 422 ppm
8.0	1,300	179	338

RESPECTFULLY SUBMITTED

Wes Bridger

WES BRIDGER LAB MANAGER

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Riverside CA 92501
Tel 909.383.6660
Fax 562.426.6424

APPENDIX C

LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSIS

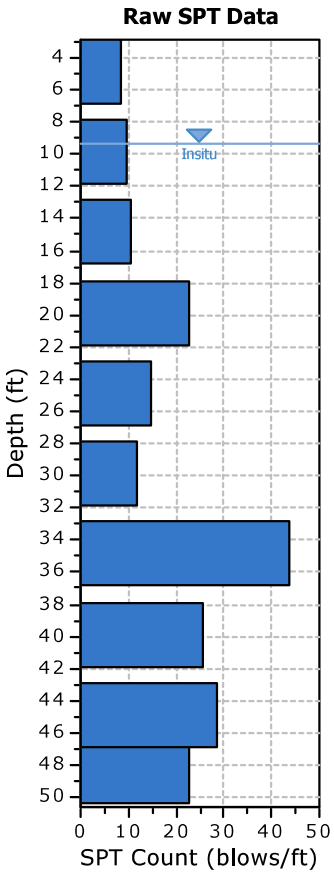
SPT BASED LIQUEFACTION ANALYSIS REPORT

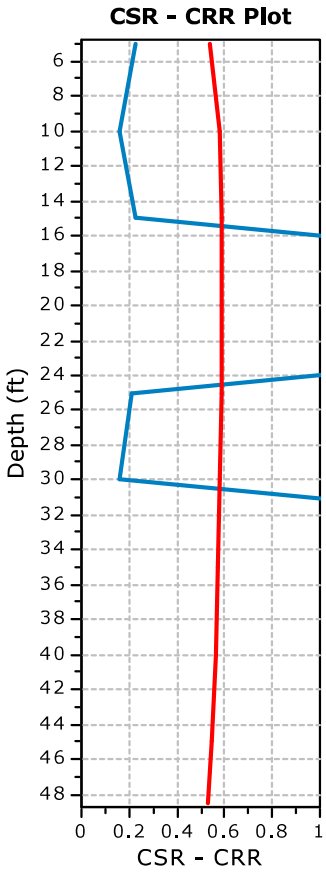
Project title : Ruether Ave **SPT Name: B-1**

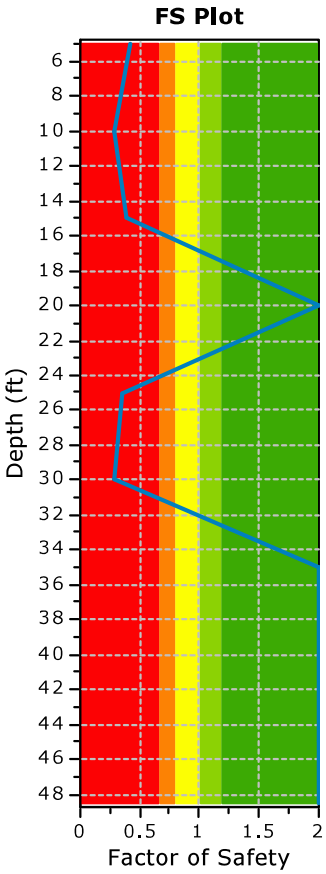
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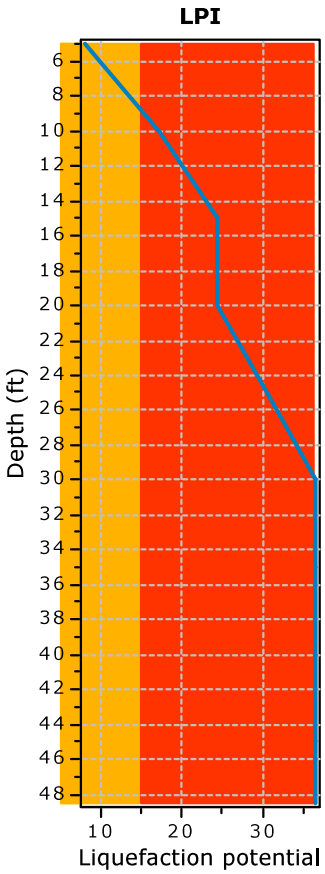
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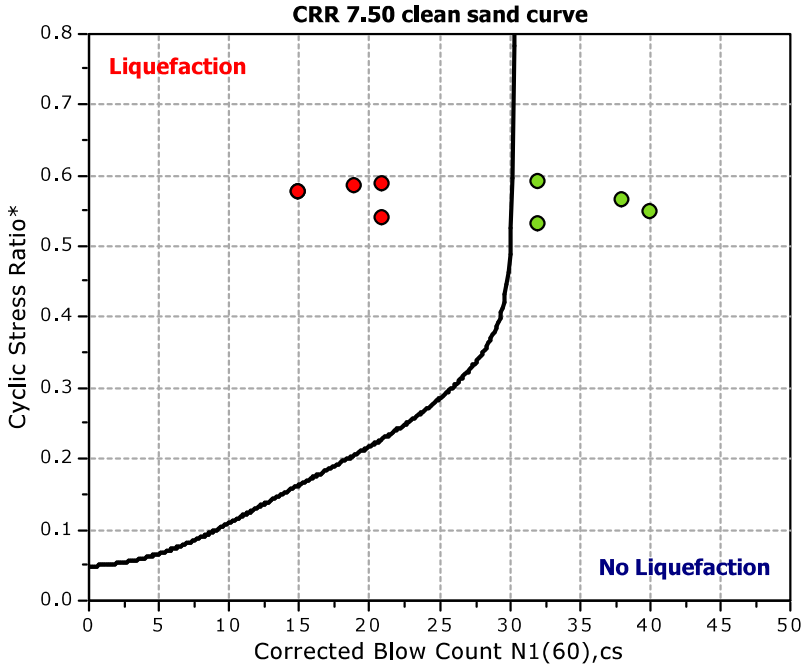
Analysis method:	NCEER 1998	G.W.T. (in-situ):	9.30 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	1.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	7.91
Borehole diameter:	200mm	Peak ground acceleration:	0.45 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		











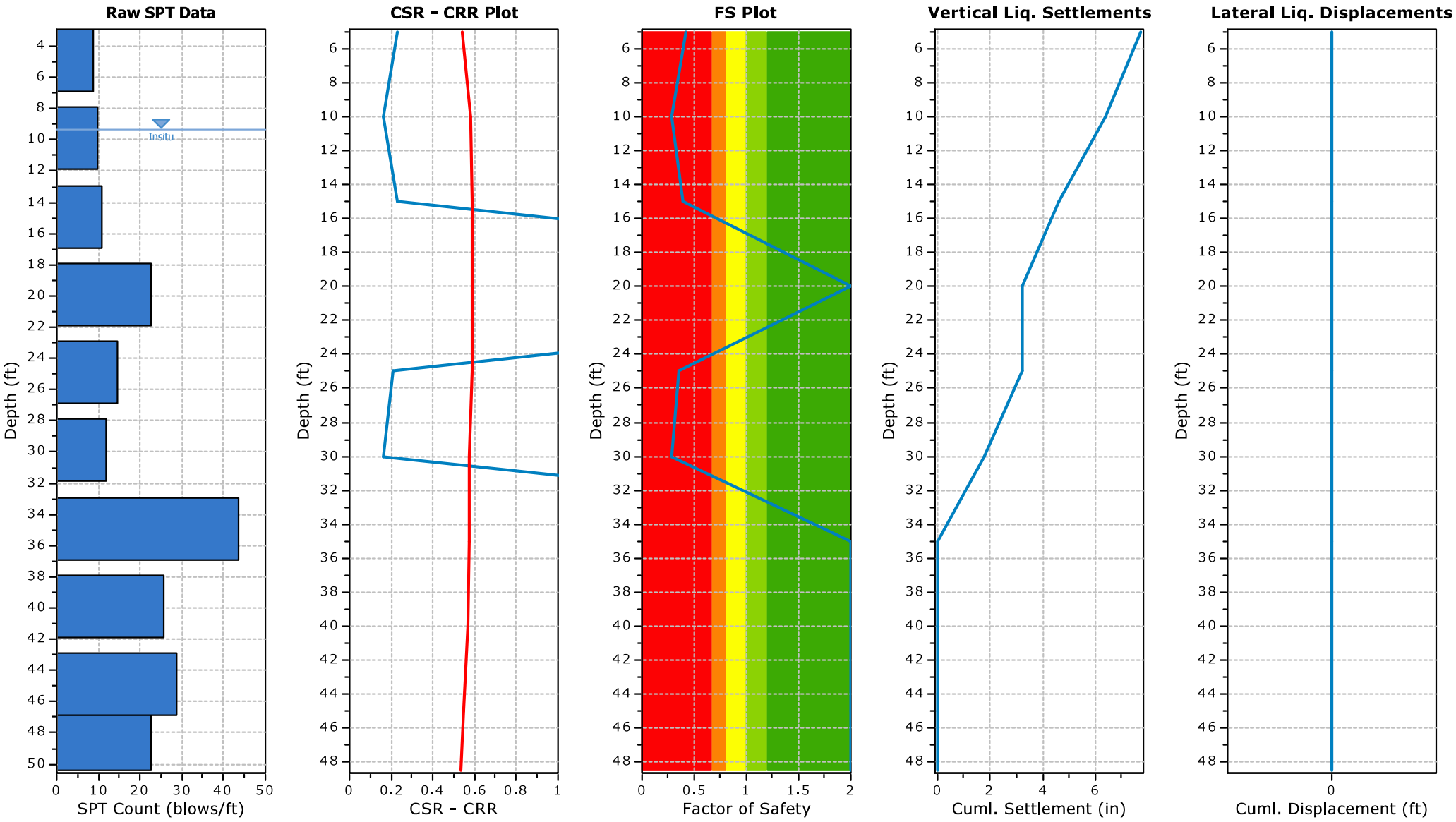
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
5.00	9	21.70	130.00	5.00	Yes
10.00	10	5.00	130.00	5.00	Yes
15.00	11	25.60	130.00	5.00	Yes
20.00	23	5.00	130.00	5.00	Yes
25.00	15	4.80	130.00	5.00	Yes
30.00	12	4.80	130.00	5.00	Yes
35.00	44	30.00	130.00	5.00	Yes
40.00	26	30.00	130.00	5.00	Yes
45.00	29	30.00	130.00	5.00	Yes
48.50	23	30.00	130.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
5.00	9	130.00	0.33	0.00	0.33	1.70	1.00	1.15	0.75	1.20	16	21.70	3.88	1.09	21	0.229
10.00	10	130.00	0.65	0.02	0.63	1.30	1.00	1.15	0.85	1.20	15	5.00	0.00	1.00	15	0.163
15.00	11	130.00	0.97	0.18	0.80	1.15	1.00	1.15	0.85	1.20	15	25.60	4.35	1.12	21	0.229
20.00	23	130.00	1.30	0.33	0.97	1.05	1.00	1.15	0.95	1.20	32	5.00	0.00	1.00	32	4.000
25.00	15	130.00	1.63	0.49	1.14	0.97	1.00	1.15	0.95	1.20	19	4.80	0.00	1.00	19	0.206
30.00	12	130.00	1.95	0.65	1.30	0.90	1.00	1.15	1.00	1.20	15	4.80	0.00	1.00	15	0.163
35.00	44	130.00	2.27	0.80	1.47	0.85	1.00	1.15	1.00	1.20	51	30.00	4.71	1.15	64	4.000
40.00	26	130.00	2.60	0.96	1.64	0.80	1.00	1.15	1.00	1.20	29	30.00	4.71	1.15	38	4.000
45.00	29	130.00	2.92	1.11	1.81	0.76	1.00	1.15	1.00	1.20	31	30.00	4.71	1.15	40	4.000
48.50	23	130.00	3.15	1.22	1.93	0.74	1.00	1.15	1.00	1.20	24	30.00	4.71	1.15	32	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
5.00	130.00	0.33	0.12	0.20	0.99	1.00	0.470	0.87	0.539	1.00	0.539	0.426	●
10.00	130.00	0.65	0.28	0.37	0.98	1.00	0.504	0.87	0.578	1.00	0.578	0.283	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
15.00	130.00	0.97	0.44	0.54	0.97	1.00	0.513	0.87	0.588	1.00	0.588	0.390	●
20.00	130.00	1.30	0.59	0.71	0.96	1.00	0.515	0.87	0.590	1.00	0.590	2.000	●
25.00	130.00	1.63	0.75	0.88	0.94	1.00	0.511	0.87	0.586	1.00	0.586	0.352	●
30.00	130.00	1.95	0.90	1.05	0.92	1.00	0.502	0.87	0.576	1.00	0.576	0.284	●
35.00	130.00	2.27	1.06	1.21	0.89	1.00	0.488	0.87	0.560	0.97	0.575	2.000	●
40.00	130.00	2.60	1.22	1.38	0.85	1.00	0.468	0.87	0.536	0.95	0.566	2.000	●
45.00	130.00	2.92	1.37	1.55	0.80	1.00	0.443	0.87	0.508	0.93	0.548	2.000	●
48.50	130.00	3.15	1.48	1.67	0.77	1.00	0.424	0.87	0.486	0.91	0.532	2.000	●

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied)***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
5.00	0.426	0.57	9.24	5.00	8.09
10.00	0.283	0.72	8.48	5.00	9.27
15.00	0.390	0.61	7.71	5.00	7.17
20.00	2.000	0.00	6.95	5.00	0.00
25.00	0.352	0.65	6.19	5.00	6.11
30.00	0.284	0.72	5.43	5.00	5.92
35.00	2.000	0.00	4.67	5.00	0.00
40.00	2.000	0.00	3.90	5.00	0.00
45.00	2.000	0.00	3.14	5.00	0.00
48.50	2.000	0.00	2.61	3.50	0.00

Overall potential I_L : 36.56

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
5.00	0.00	5.00	1.00	2.25	5.00	1.347
10.00	0.00	5.00	1.00	2.96	5.00	1.775
15.00	0.00	5.00	1.00	2.25	5.00	1.347
20.00	0.00	5.00	1.00	0.00	5.00	0.000
25.00	0.00	5.00	1.00	2.44	5.00	1.462

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
30.00	0.00	5.00	1.00	2.96	5.00	1.775
35.00	0.00	5.00	1.00	0.00	5.00	0.000
40.00	0.00	5.00	1.00	0.00	5.00	0.000
45.00	0.00	5.00	1.00	0.00	5.00	0.000
48.50	0.00	5.00	1.00	0.00	5.00	0.000

Cumulative settlements: 7.706

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
5.00	16	56.00	22.70	5.00	0.000	0.00
10.00	15	54.22	34.10	5.00	0.000	0.00
15.00	15	54.22	34.10	5.00	0.000	0.00
20.00	32	79.20	0.00	5.00	0.000	0.00
25.00	19	61.02	22.70	5.00	0.000	0.00
30.00	15	54.22	34.10	5.00	0.000	0.00
35.00	51	100.00	0.00	5.00	0.000	0.00
40.00	29	75.39	0.00	5.00	0.000	0.00
45.00	31	77.95	0.00	5.00	0.000	0.00
48.50	24	68.59	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

SPT BASED LIQUEFACTION ANALYSIS REPORT

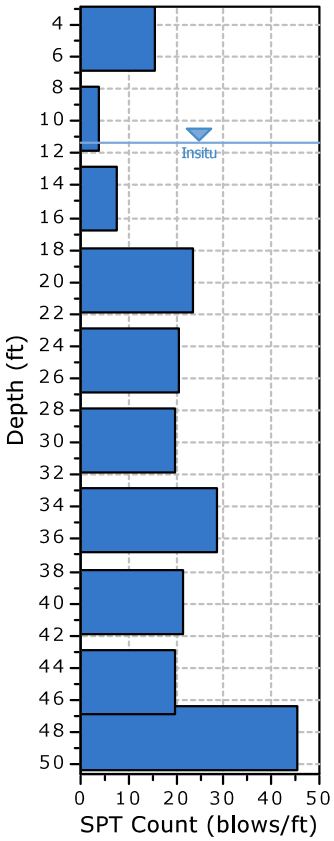
Project title : Ruether Ave **SPT Name: B-3**

Location :

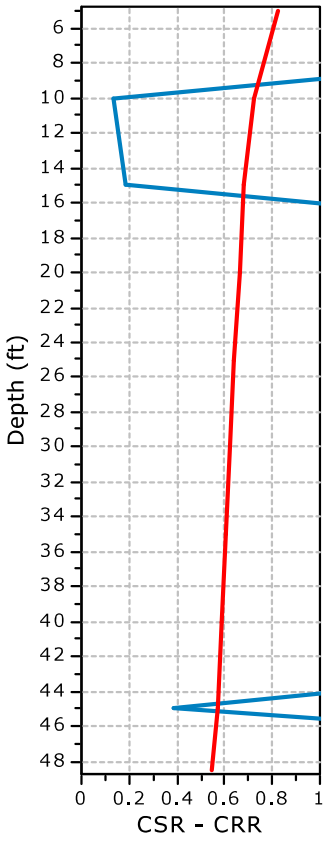
:: Input parameters and analysis properties ::

Analysis method:	NCEER 1998	G.W.T. (in-situ):	11.30 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	-3.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	7.91
Borehole diameter:	200mm	Peak ground acceleration:	0.45 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		

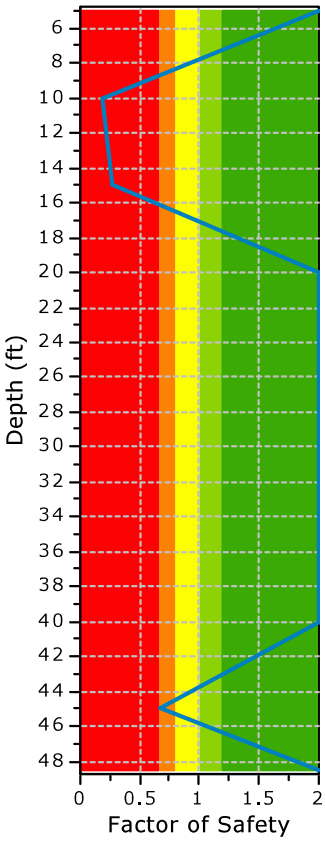
Raw SPT Data



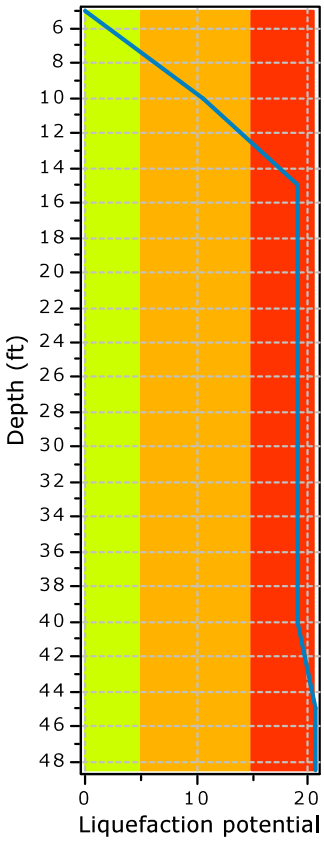
CSR - CRR Plot



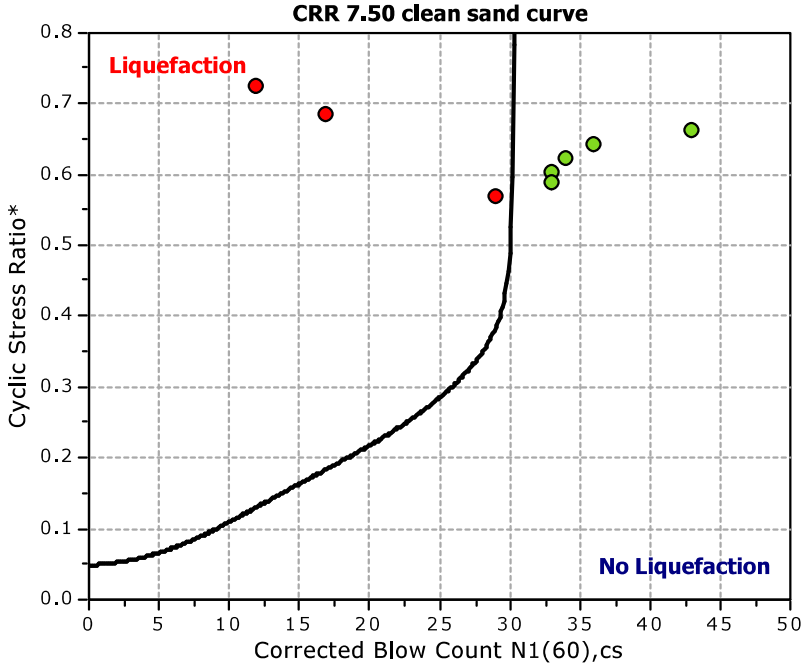
FS Plot



LPI



CRR 7.50 clean sand curve



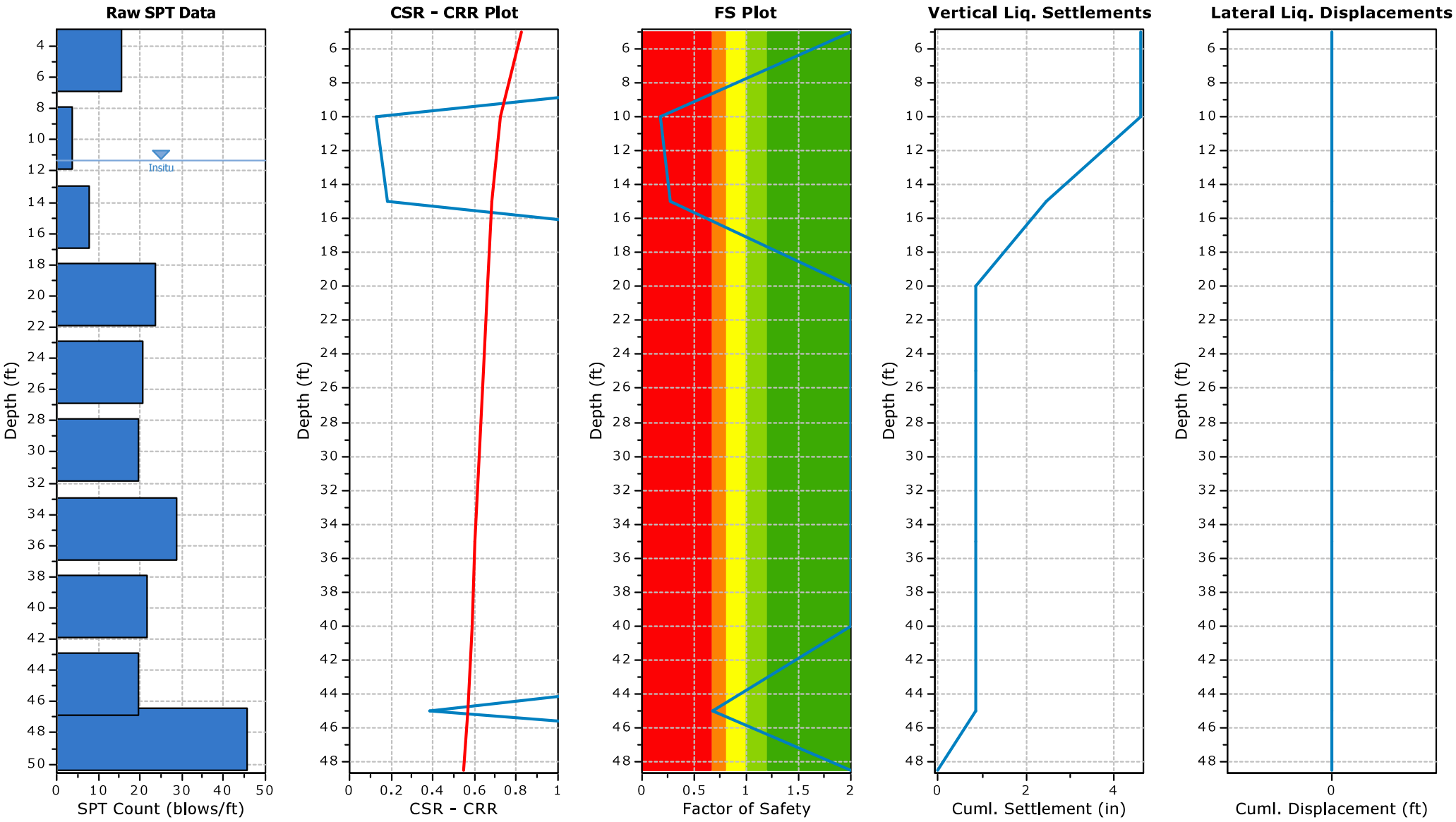
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
5.00	16	22.00	130.00	5.00	Yes
10.00	4	41.90	130.00	5.00	Yes
15.00	8	41.90	130.00	5.00	Yes
20.00	24	45.10	130.00	5.00	Yes
25.00	21	45.10	130.00	5.00	Yes
30.00	20	45.10	130.00	5.00	Yes
35.00	29	5.00	130.00	5.00	Yes
40.00	22	30.80	130.00	5.00	Yes
45.00	20	30.80	130.00	5.00	Yes
48.50	46	30.80	130.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
5.00	16	130.00	0.33	0.00	0.33	1.70	1.00	1.15	0.75	1.20	28	22.00	3.93	1.09	35	4.000
10.00	4	130.00	0.65	0.00	0.65	1.28	1.00	1.15	0.85	1.20	6	41.90	5.00	1.20	12	0.131
15.00	8	130.00	0.97	0.12	0.86	1.11	1.00	1.15	0.85	1.20	10	41.90	5.00	1.20	17	0.185
20.00	24	130.00	1.30	0.27	1.03	1.01	1.00	1.15	0.95	1.20	32	45.10	5.00	1.20	43	4.000
25.00	21	130.00	1.63	0.43	1.20	0.94	1.00	1.15	0.95	1.20	26	45.10	5.00	1.20	36	4.000
30.00	20	130.00	1.95	0.58	1.37	0.88	1.00	1.15	1.00	1.20	24	45.10	5.00	1.20	34	4.000
35.00	29	130.00	2.27	0.74	1.54	0.83	1.00	1.15	1.00	1.20	33	5.00	0.00	1.00	33	4.000
40.00	22	130.00	2.60	0.90	1.70	0.79	1.00	1.15	1.00	1.20	24	30.80	4.76	1.16	33	4.000
45.00	20	130.00	2.92	1.05	1.87	0.75	1.00	1.15	1.00	1.20	21	30.80	4.76	1.16	29	0.384
48.50	46	130.00	3.15	1.16	1.99	0.73	1.00	1.15	1.00	1.20	46	30.80	4.76	1.16	58	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
5.00	130.00	0.42	0.25	0.17	0.99	1.00	0.717	0.87	0.822	1.00	0.822	2.000	●
10.00	130.00	0.74	0.41	0.34	0.98	1.00	0.630	0.87	0.722	1.00	0.722	0.181	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
15.00	130.00	1.07	0.56	0.51	0.97	1.00	0.597	0.87	0.685	1.00	0.685	0.270	●
20.00	130.00	1.39	0.72	0.68	0.96	1.00	0.577	0.87	0.661	1.00	0.661	2.000	●
25.00	130.00	1.72	0.87	0.84	0.94	1.00	0.560	0.87	0.642	1.00	0.642	2.000	●
30.00	130.00	2.04	1.03	1.01	0.92	1.00	0.543	0.87	0.622	1.00	0.622	2.000	●
35.00	130.00	2.37	1.19	1.18	0.89	1.00	0.522	0.87	0.598	0.99	0.601	2.000	●
40.00	130.00	2.69	1.34	1.35	0.85	1.00	0.496	0.87	0.569	0.97	0.589	2.000	●
45.00	130.00	3.02	1.50	1.52	0.80	1.00	0.467	0.87	0.535	0.94	0.568	0.675	●
48.50	130.00	3.25	1.61	1.64	0.77	1.00	0.445	0.87	0.510	0.93	0.550	2.000	●

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied)***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
5.00	2.000	0.00	9.24	5.00	0.00
10.00	0.181	0.82	8.48	5.00	10.57
15.00	0.270	0.73	7.71	5.00	8.58
20.00	2.000	0.00	6.95	5.00	0.00
25.00	2.000	0.00	6.19	5.00	0.00
30.00	2.000	0.00	5.43	5.00	0.00
35.00	2.000	0.00	4.67	5.00	0.00
40.00	2.000	0.00	3.90	5.00	0.00
45.00	0.675	0.32	3.14	5.00	1.55
48.50	2.000	0.00	2.61	3.50	0.00

Overall potential I_L : 20.71

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
5.00	0.00	5.00	1.00	0.00	5.00	0.000
10.00	0.00	5.00	1.00	3.55	5.00	2.131
15.00	0.00	5.00	1.00	2.67	5.00	1.602
20.00	0.00	5.00	1.00	0.00	5.00	0.000
25.00	0.00	5.00	1.00	0.00	5.00	0.000

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
30.00	0.00	5.00	1.00	0.00	5.00	0.000
35.00	0.00	5.00	1.00	0.00	5.00	0.000
40.00	0.00	5.00	1.00	0.00	5.00	0.000
45.00	0.00	5.00	1.00	1.45	5.00	0.870
48.50	0.00	5.00	1.00	0.00	5.00	0.000

Cumulative settlements: 4.604

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
5.00	28	74.08	0.00	5.00	0.000	0.00
10.00	6	34.29	51.20	5.00	0.000	0.00
15.00	10	44.27	51.20	5.00	0.000	0.00
20.00	32	79.20	0.00	5.00	0.000	0.00
25.00	26	71.39	0.00	5.00	0.000	0.00
30.00	24	68.59	0.00	5.00	0.000	0.00
35.00	33	80.42	0.00	5.00	0.000	0.00
40.00	24	68.59	0.00	5.00	0.000	0.00
45.00	21	64.16	20.28	5.00	0.000	0.00
48.50	46	100.00	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

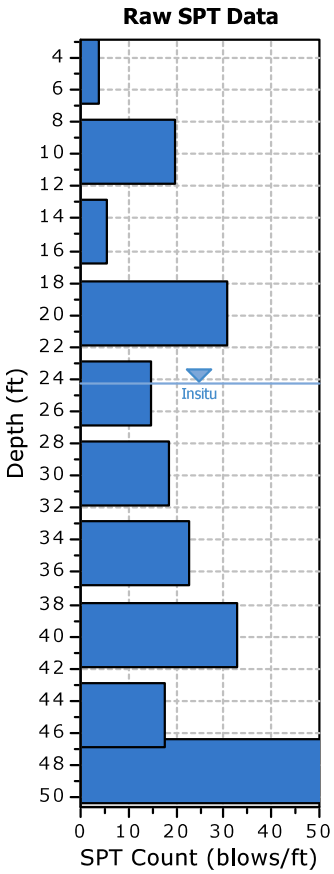
SPT BASED LIQUEFACTION ANALYSIS REPORT

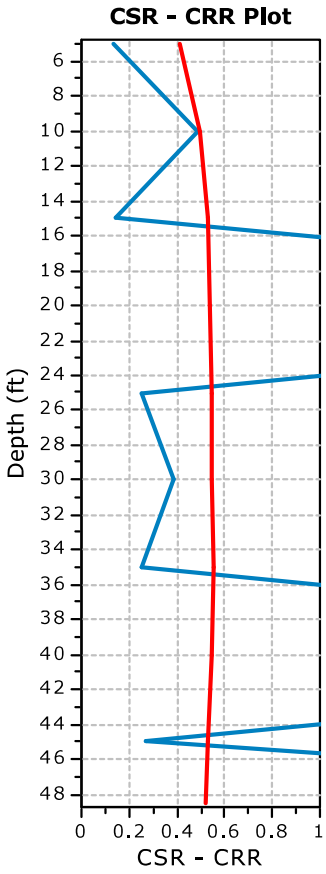
Project title : Ruether Ave **SPT Name: B-5**

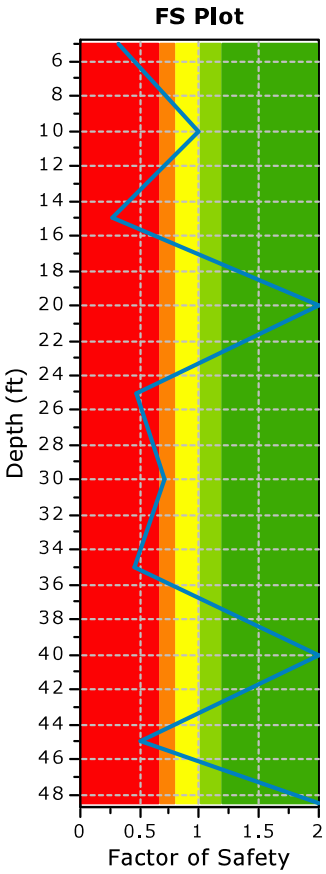
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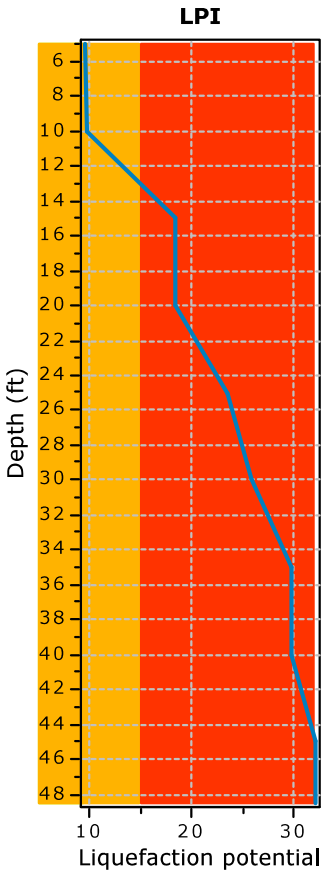
:: Input parameters and analysis properties ::

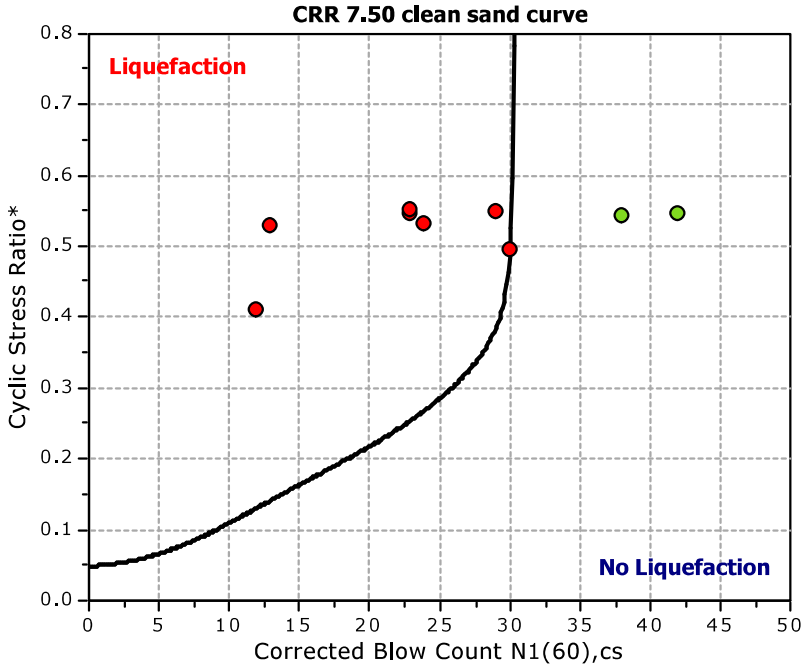
Analysis method:	NCEER 1998	G.W.T. (in-situ):	24.30 ft
Fines correction method:	NCEER 1998	G.W.T. (earthq.):	3.00 ft
Sampling method:	Sampler wo liners	Earthquake magnitude M_w:	7.91
Borehole diameter:	200mm	Peak ground acceleration:	0.45 g
Rod length:	3.30 ft	Eq. external load:	0.00 tsf
Hammer energy ratio:	1.00		











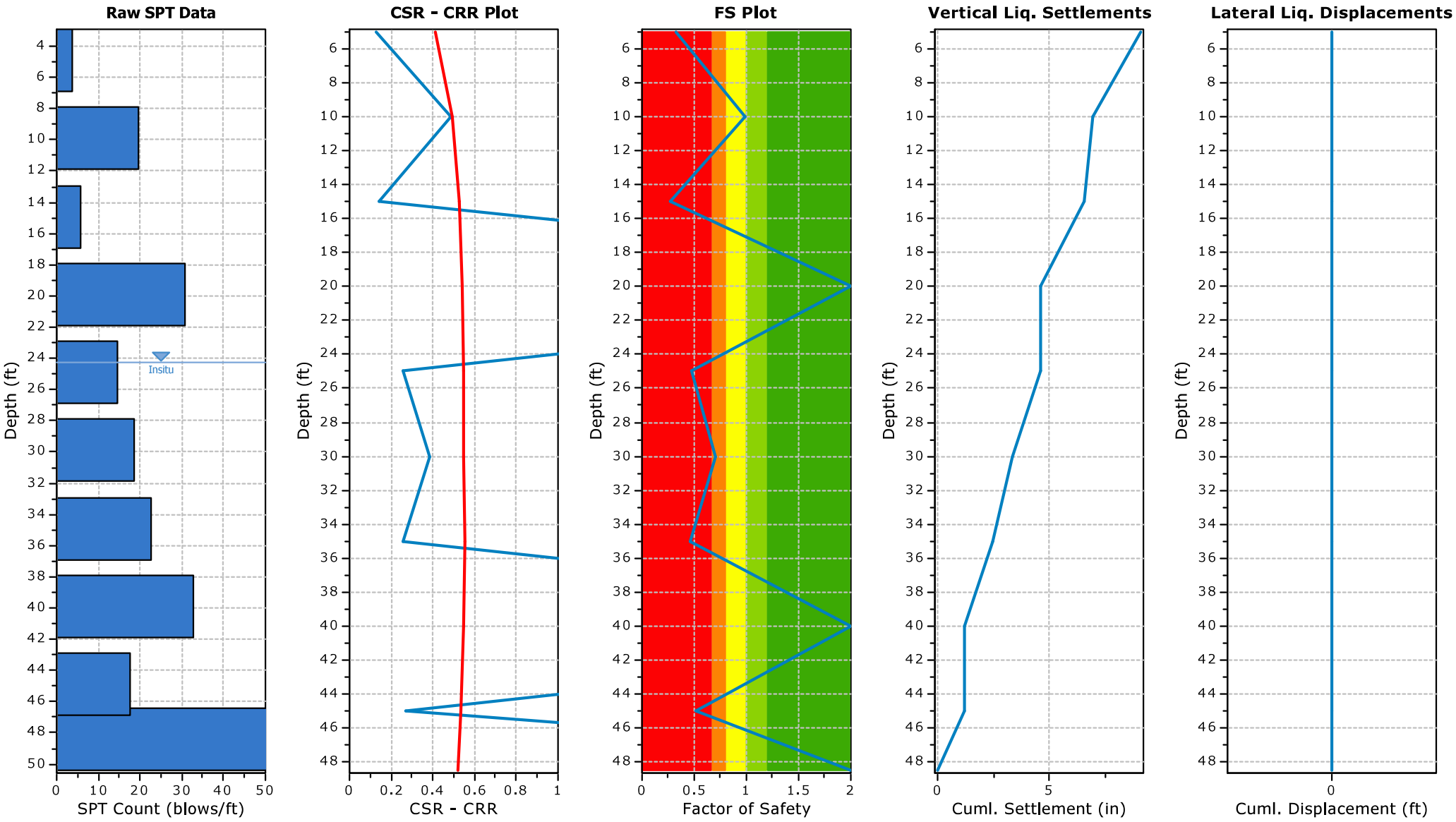
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

:: Overall Liquefaction Assessment Analysis Plots ::



:: Field input data ::

Test Depth (ft)	SPT Field Value (blows)	Fines Content (%)	Unit Weight (pcf)	Infl. Thickness (ft)	Can Liquefy
5.00	4	22.00	130.00	5.00	Yes
10.00	20	5.00	130.00	5.00	Yes
15.00	6	30.00	130.00	5.00	Yes
20.00	31	7.60	130.00	5.00	Yes
25.00	15	30.00	130.00	5.00	Yes
30.00	19	48.60	130.00	5.00	Yes
35.00	23	5.00	130.00	5.00	Yes
40.00	33	30.00	130.00	5.00	Yes
45.00	18	30.00	130.00	5.00	Yes
48.50	100	30.00	130.00	5.00	Yes

Abbreviations

Depth: Depth at which test was performed (ft)
SPT Field Value: Number of blows per foot
Fines Content: Fines content at test depth (%)
Unit Weight: Unit weight at test depth (pcf)
Infl. Thickness: Thickness of the soil layer to be considered in settlements analysis (ft)
Can Liquefy: User defined switch for excluding/including test depth from the analysis procedure

:: Cyclic Resistance Ratio (CRR) calculation data ::

Depth (ft)	SPT Field Value	Unit Weight (pcf)	σ_v (tsf)	u_o (tsf)	σ'_{vo} (tsf)	C_N	C_E	C_B	C_R	C_S	$(N_1)_{60}$	Fines Content (%)	α	β	$(N_1)_{60cs}$	$CRR_{7.5}$
5.00	4	130.00	0.33	0.00	0.33	1.70	1.00	1.15	0.75	1.20	7	22.00	3.93	1.09	12	0.131
10.00	20	130.00	0.65	0.00	0.65	1.28	1.00	1.15	0.85	1.20	30	5.00	0.00	1.00	30	0.488
15.00	6	130.00	0.97	0.00	0.97	1.04	1.00	1.15	0.85	1.20	7	30.00	4.71	1.15	13	0.142
20.00	31	130.00	1.30	0.00	1.30	0.90	1.00	1.15	0.95	1.20	37	7.60	0.22	1.01	38	4.000
25.00	15	130.00	1.63	0.02	1.60	0.81	1.00	1.15	0.95	1.20	16	30.00	4.71	1.15	23	0.255
30.00	19	130.00	1.95	0.18	1.77	0.77	1.00	1.15	1.00	1.20	20	48.60	5.00	1.20	29	0.384
35.00	23	130.00	2.27	0.33	1.94	0.74	1.00	1.15	1.00	1.20	23	5.00	0.00	1.00	23	0.255
40.00	33	130.00	2.60	0.49	2.11	0.71	1.00	1.15	1.00	1.20	32	30.00	4.71	1.15	42	4.000
45.00	18	130.00	2.92	0.65	2.28	0.68	1.00	1.15	1.00	1.20	17	30.00	4.71	1.15	24	0.269
48.50	100	130.00	3.15	0.76	2.40	0.66	1.00	1.15	1.00	1.20	92	30.00	4.71	1.15	111	4.000

Abbreviations

σ_v: Total stress during SPT test (tsf)
u_o: Water pore pressure during SPT test (tsf)
σ'_{vo}: Effective overburden pressure during SPT test (tsf)
C_N: Overburden corretion factor
C_E: Energy correction factor
C_B: Borehole diameter correction factor
C_R: Rod length correction factor
C_S: Liner correction factor
$N_{1(60)}$: Corrected N_{SPT} to a 60% energy ratio
α, β: Clean sand equivalent clean sand formula coefficients
$N_{1(60)cs}$: Corected $N_{1(60)}$ value for fines content
$CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
5.00	130.00	0.33	0.06	0.26	0.99	1.00	0.358	0.87	0.411	1.00	0.411	0.319	●
10.00	130.00	0.65	0.22	0.43	0.98	1.00	0.431	0.87	0.494	1.00	0.494	0.987	●

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Depth (ft)	Unit Weight (pcf)	$\sigma_{v,eq}$ (tsf)	$u_{o,eq}$ (tsf)	$\sigma'_{vo,eq}$ (tsf)	r_d	α	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR^*	FS	
15.00	130.00	0.97	0.37	0.60	0.97	1.00	0.460	0.87	0.527	1.00	0.527	0.269	●
20.00	130.00	1.30	0.53	0.77	0.96	1.00	0.473	0.87	0.542	1.00	0.542	2.000	●
25.00	130.00	1.63	0.69	0.94	0.94	1.00	0.477	0.87	0.547	1.00	0.547	0.466	●
30.00	130.00	1.95	0.84	1.11	0.92	1.00	0.474	0.87	0.543	0.99	0.548	0.699	●
35.00	130.00	2.27	1.00	1.28	0.89	1.00	0.464	0.87	0.532	0.96	0.553	0.461	●
40.00	130.00	2.60	1.15	1.45	0.85	1.00	0.448	0.87	0.513	0.94	0.546	2.000	●
45.00	130.00	2.92	1.31	1.61	0.80	1.00	0.426	0.87	0.488	0.92	0.531	0.507	●
48.50	130.00	3.15	1.42	1.73	0.77	1.00	0.409	0.87	0.469	0.91	0.517	2.000	●

Abbreviations

$\sigma_{v,eq}$: Total overburden pressure at test point, during earthquake (tsf)
$u_{o,eq}$: Water pressure at test point, during earthquake (tsf)
$\sigma'_{vo,eq}$: Effective overburden pressure, during earthquake (tsf)
r_d : Nonlinear shear mass factor
α: Improvement factor due to stone columns
CSR : Cyclic Stress Ratio (adjusted for improvement)
MSF : Magnitude Scaling Factor
$CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
K_{sigma}: Effective overburden stress factor
CSR^*: CSR fully adjusted (user FS applied)***
FS: Calculated factor of safety against soil liquefaction

*** User FS: 1.00

:: Liquefaction potential according to Iwasaki ::

Depth (ft)	FS	F	wz	Thickness (ft)	I_L
5.00	0.319	0.68	9.24	5.00	9.59
10.00	0.987	0.01	8.48	5.00	0.17
15.00	0.269	0.73	7.71	5.00	8.59
20.00	2.000	0.00	6.95	5.00	0.00
25.00	0.466	0.53	6.19	5.00	5.03
30.00	0.699	0.30	5.43	5.00	2.49
35.00	0.461	0.54	4.67	5.00	3.83
40.00	2.000	0.00	3.90	5.00	0.00
45.00	0.507	0.49	3.14	5.00	2.36
48.50	2.000	0.00	2.61	3.50	0.00

Overall potential I_L : 32.06

I_L = 0.00 - No liquefaction
I_L between 0.00 and 5 - Liquefaction not probable
I_L between 5 and 15 - Liquefaction probable
I_L > 15 - Liquefaction certain

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
5.00	0.00	5.00	1.00	3.55	5.00	2.131
10.00	0.00	5.00	1.00	0.61	5.00	0.364
15.00	0.00	5.00	1.00	3.33	5.00	1.996
20.00	0.00	5.00	1.00	0.00	5.00	0.000
25.00	0.00	5.00	1.00	2.08	5.00	1.250

:: Vertical settlements estimation for saturated sands ::

Depth (ft)	D_{50} (in)	q_c/N	e_v weight factor	e_v (%)	Δh (ft)	s (in)
30.00	0.00	5.00	1.00	1.45	5.00	0.870
35.00	0.00	5.00	1.00	2.08	5.00	1.250
40.00	0.00	5.00	1.00	0.00	5.00	0.000
45.00	0.00	5.00	1.00	2.01	5.00	1.207
48.50	0.00	5.00	1.00	0.00	5.00	0.000

Cumulative settlements: 9.069

Abbreviations

D_{50}: Median grain size (in)
q_c/N: Ratio of cone resistance to SPT
e_v: Post liquefaction volumetric strain (%)
Δh: Thickness of soil layer to be considered (ft)
s: Estimated settlement (in)

:: Lateral displacements estimation for saturated sands ::

Depth (ft)	$(N_1)_{60}$	D_r (%)	γ_{max} (%)	d_z (ft)	LDI	LD (ft)
5.00	7	37.04	51.20	5.00	0.000	0.00
10.00	30	76.68	3.31	5.00	0.000	0.00
15.00	7	37.04	51.20	5.00	0.000	0.00
20.00	37	85.16	0.00	5.00	0.000	0.00
25.00	16	56.00	22.70	5.00	0.000	0.00
30.00	20	62.61	17.40	5.00	0.000	0.00
35.00	23	67.14	14.50	5.00	0.000	0.00
40.00	32	79.20	0.00	5.00	0.000	0.00
45.00	17	57.72	22.70	5.00	0.000	0.00
48.50	92	100.00	0.00	5.00	0.000	0.00

Cumulative lateral displacements: 0.00

Abbreviations

D_r: Relative density (%)
γ_{max}: Maximum amplitude of cyclic shear strain (%)
d_z: Soil layer thickness (ft)
LDI: Lateral displacement index (ft)
LD: Actual estimated displacement (ft)

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APPENDIX D

SEEPAGE AND SLOPE STABILITY ANALYSES

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Appendix D

Seepage and Slope Stability Analyses

We performed engineering analysis to evaluate the stability of the embankments and side slopes. The analysis includes seepage and slope stability. The slope stability analysis includes static surficial stability, static global stability, and global seismic stability. The seepage analysis is performed to obtain the average exit gradient at the toe of the embankment to estimate factors of safety against soil piping and boiling and to obtain pore pressure conditions in the soils for global slope stability analysis.

The static surficial slope stability is evaluated using infinite slope stability analysis. Details and results of the analysis are shown in Figure D-1. A factor of safety of 1.63 is obtained, greater than the generally required minimum factor of safety of 1.5.

The following sections present the details and results of the global seepage and slope stability analyses and seismic deformation evaluation for the embankment and side slopes.

1. Analysis Approach

The seepage analysis was performed using the 2-dimensional (2D) finite element method (FEM) built into the computer program Slide2 Build 9.031 64bit (Rocscience, 2023). Triangular elements were used for the FEM analysis. Boundary conditions for the seepage analysis are described in Section 5 of this appendix.

The stability analyses were performed using the 2D limit equilibrium computer program Slide2 Build 9.031 64bit (Rocscience, 2023). Slide is a commercially available program that uses the limit equilibrium theory to estimate the factors of safety for earth and rock slopes. The comprehensive formulation of Slide makes it possible to select a variety of methods for computing the factor of safety, and to analyze both simple and complex geometric, stratigraphic, and loading conditions. The Spencer method was used to analyze the stability of the slopes. The method satisfies both force and moment equilibrium, and accounts for inter-slice forces.

Seismic stability is analyzed using the pseudo-static analysis procedure to obtain the seismic yield coefficient, which is then used to estimate seismic deformation of the embankments and side slopes.

2. Cross Sections

We performed seepage and stability analyses on the embankments using a representative cross section. The section has an embankment height of approximately 20 feet and an embankment slope gradient of 3H:1V (horizontal:vertical).

3. Material Properties

Based on the field and laboratory testing programs, the material parameters used in the analyses are presented in Table D-1 as well as the graphical outputs of the analyses. We note that the 8-inch soil cement and 12-inch aggregate pavement are not modeled and the entire embankment is modeled as one material "embankment soil", which is considered conservative. The ultimate shear strength parameters are used in static stability analysis. The seismic stability analysis used peak shear strength parameters for soils with negligible liquefaction potential and residual strengths for liquefiable soil layers identified in liquefaction

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analysis. The residual strengths of the liquefiable soil layers are estimated using the Seed and Harder (1990)[1] correlation with SPT blow counts $(N_1)_{60,CS}$.

Table D-1 – Sher Strength Parameters of Engineered Fill used in Stability Analysis

Material	Unit Weight (pcf)	Ultimate Shear Strength Parameters		Peak Shear Strength Parameters		Permeability (feet/second)
		Friction Angle (°)	Cohesion (psf)	Friction Angle (°)	Cohesion (psf)	
Embankment Soil	130	28	125	28	250	3.28E-6
Foundation Soil	130	31	25	33	25	3.28E-5
Liquefiable Embankment Soil Between Depths 5 and 15 feet	130	NA	NA	0	540	3.28E-6
Liquefiable Foundation Soil Between Depths 25 and 35 feet	130	NA	NA	0	940	3.28E-5
Liquefiable Foundation Soil Between Depths 42.5 and 47.5 feet	130	NA	NA	0	1,040	3.28E-5

Notes: pcf = pounds per cubic foot; psf = pounds per square foot.

4. Loading Conditions

The critical condition for the embankments and side slopes occurs during rapid drawdown or steady-state seepage, when water in the lower pond is lowered to the pond bottom while water in the higher pond on the other side of the embankment remains at the maximum design elevation. Additionally, the slope on the lower pond side is not subject to the water buttress effect as much as the slope on the higher pond side. Therefore, the slope on the lower pond side is more critical.

The embankments are expected to behave about the same under the rapid drawdown and the steady state seepage conditions, because they consist primarily of silty sand and poorly graded sand, that have relatively high permeability.

The loading conditions presented in Table D-2 are analyzed. As can be seen, in addition to Cases (a) through (d) for the critical condition and for comparison purposes, Cases (e) and (f) are analyzed for one more condition where the maximum design water elevation of 1,554 feet is in the higher pond and the maximum design water elevation of 1,547 feet in the lower pond.

[1] Seed, R.B. and L.F. Harder, (1990), SPT-Based Analysis of Cyclic Pore Pressure Generation and Undrained Residual Strength. In: Duncan, J.M., Ed., Proceedings of the H.B. Seed Memorial Symposium, Vol. 2, BiTech Publishers, Richmond, 351-376.

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Seismic loading was modeled using the pseudo-static analysis with a horizontal seismic coefficient k applied to the sliding mass. A k value that results in a factor of safety of one in seismic stability, which is known as yield seismic coefficient ky, is found through trial and error.

Table D-2 – Loading Conditions for Seepage and Slope Stability Analysis

Analysis Case	Upstream Water Level Elevation (feet msl)	Downstream Water Level Elevation (feet msl)	Yield Seismic Coefficient ky
(a) Seepage for (b)	1,554	Bottom of lower pond	NA
(b) Global Static Stability	1,554	Bottom of lower pond	NA
(c) Seepage for (d)	1,554	Bottom of lower pond	NA
(d) Global Seismic Stability	1,554	Bottom of lower pond	0.24
(e) Seepage for (f)	1,554	1,547	NA
(f) Global Seismic Stability	1,554	1,547	0.28
Notes: [1] NA = not applicable.			

5. Groundwater and Boundary Conditions

Groundwater conditions used in the stability analysis were obtained from the seepage analyses. The finite element mesh and boundary conditions are shown in Figures D-2 through D-4 for seepage analysis Cases (a), (c) and (e), respectively.

The boundary conditions for seepage analysis Cases (a) and (c) include a constant total head of 1,554 feet for the upstream boundary below the maximum design water elevation, a zero-pressure head for the boundary along the bottom of the lower pond, and an unknown boundary (P=0 or Q=0) for the other portions of the embankment. The boundary conditions for Case (e) include a constant total head of 1,554 feet for the upstream boundary below the maximum design water elevation in the higher pond, a constant total head of 1,547 feet for the downstream boundary below the maximum design water elevation in the lower pond, and an unknown boundary (P=0 or Q=0) for the other portions of the embankment.

6. Seismic Deformation

The yield seismic coefficient ky is used to estimate seismic deformation of the embankments and side slopes using the Stewart et al. (2003)[2] procedure and CGS Special Publication 117A (CGS, 2008)[3]. CGS, (2008) recommends that seismic deformation should be based on the maximum horizontal acceleration MHA_r at the site for a soft rock site condition. Our deterministic seismic hazard analysis for a soft rock site condition indicates an MHAr value of 0.51 g for the 50th percentile ground motion from the controlling earthquake scenario which has a moment magnitude (Mw) is 7.91 and a site distance (R) of 2.55 km.

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[2] Stewart, J.P., Blake, T.F., and Hollingsworth, R.A., 2003, A screen analysis procedure for seismic slope stability: Earthquake Spectra, v. 19, n.3, p. 697-712.
[3] California Geological Survey, 2008, "Guidelines for Evaluating and Mitigating Seismic Hazards in California," Special Publication 117A.

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7. Analysis Results and Conclusions

The graphic input and output of the analysis are presented in Figures D-1 through D-13 attached to this appendix. Results of the analysis are summarized in Table D-3. The average hydraulic exit gradient is about 1/3, indicating a factor of safety of 3 against soil piping and boiling. The static stability has a factor of safety greater than 1.5. The yield seismic coefficient ky is 0.24 for the most critical condition, Case (d), and 0.28 for the less critical condition, Case (f).

The seismic slope deformation estimated using the yield seismic coefficient ky and the Stewart et al. (2003) procedure is approximately 7 inches for Case (d), and 3.5 inches for Case (f).

A seismic slope deformation on the order of 6 inches is acceptable according to CGS Special Publication 117A (CGS, 2008). Considering the low likelihood of the coincidence of the most critical water levels with the design earthquake ground motion as well as the conservative model parameters used in the analysis, the calculated 7 inches of seismic slope deformation is considered acceptable for the embankment and side slopes.

The analysis results indicate the proposed improvements to the embankments and ponds are feasible, provided that new fill materials placed on the embankments consist of sand with sufficient fines content and are adequately compacted such that the compacted new fill materials have the minimum ultimate and peak shear strength parameters shown in Table D-1 for embankment soil. The excavated onsite silty sand is expected to meet the requirements when compacted to 95% relative compaction as determined by ASTM D1557.

Table D-3 – Summary of Slope Stability and Seismic Deformation Analyses

Analysis Case	Upstream Water Level Elevation (feet msl)	Downstream Water Level Elevation (feet msl)	Calculated Factor of Safety	Seismic Yield Coefficient Ky[1]	Approximate Seismic Deformation (inches)
Surficial Static Stability	Slope surface	Slope surface	**1.63**	NA[2]	NA
(a) Seepage for (b)	1,554	Bottom of pond	**3.0**	NA	NA
(b) Global Static Stability	1,554	Bottom of pond	**1.77**	NA	NA
(c) Seepage for (d)	1,554	Bottom of pond	**3.0**	NA	NA
(d) Global Seismic Stability	1,554	Bottom of pond	1.0	0.24	**7**
(e) Seepage for (f)	1,554	1,547	**3.0**	NA	NA
(f) Global Seismic Stability	1,554	1,547	1.0	0.28	**3.5**

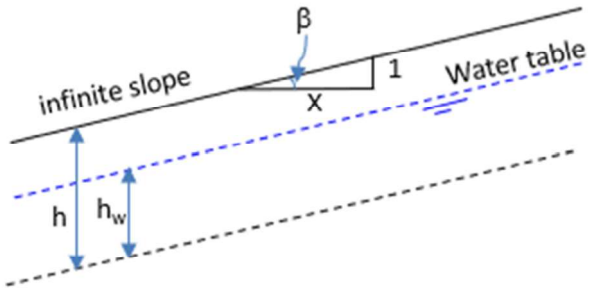
Notes: 1. NA = not applicable.
2. Yield seismic coefficient ky corresponds to a factor of safety of unity.

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Infinite Slope Stability Analysis



$$FS = \frac{c' + (\gamma_{sat} - m\,\gamma_w)\, h \cos^2\beta \tan\phi'}{\gamma_{sat}\, h \cos\beta \sin\beta}$$

where
c' = cohesion of soil
ϕ' = friction angle of soil
γ_{sat} = saturated unit weight of soil
γ_w = unit weight of water
$m = h_w/h$

c' (psf)	ϕ' (°)	γ_{sat} (pcf)	γ_w (pcf)	m	Depth of Slip Surface h (feet)	Slope gradient X:1 (H:V)	β (°)	FS
125	28	130	62.4	1	4	3	18.4	1.63

Figure D-1 Surficial Stability Evaluation

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Material Name	Color	Model	KS (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil		Simple	3.28084e-06	1	0	General
Foundation Soil		Simple	3.28084e-05	1	0	General

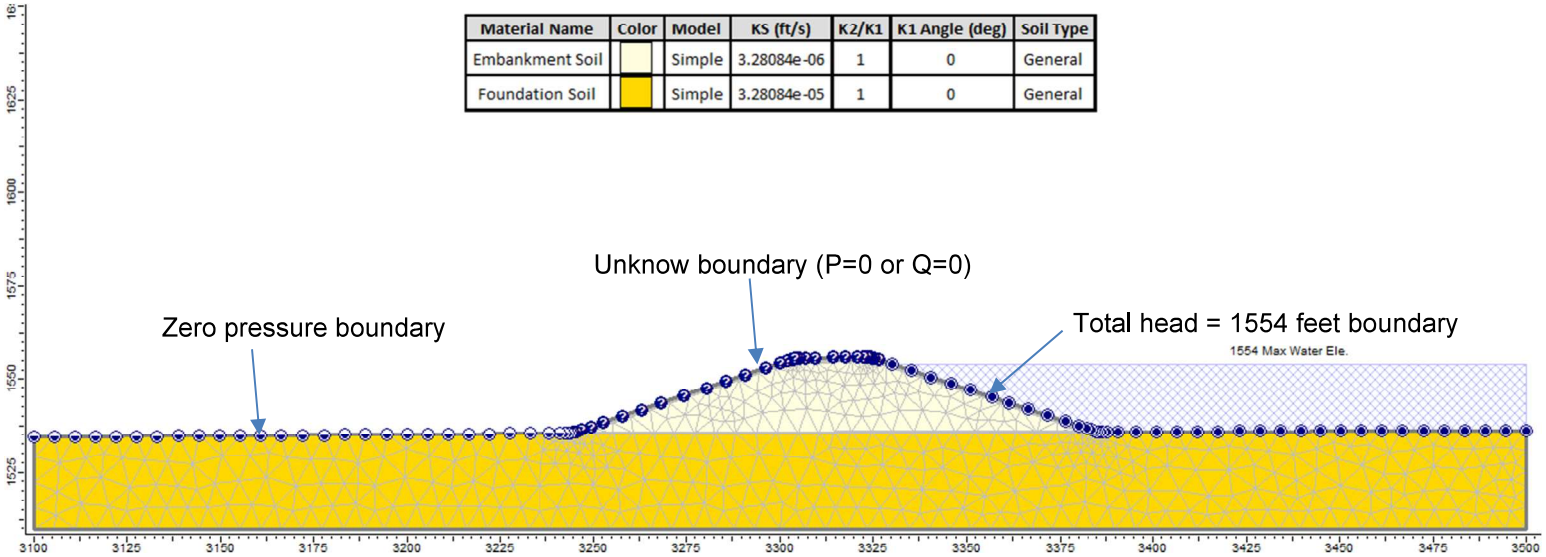


Figure D-2 Finite Element Mesh and Boundary Conditions - Case (a)

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Material Name	Color	Model	KS (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil Peak Strength		Simple	3.28084e-06	1	0	General
Liquefied (5-15)		Simple	3.28084e-06	1	0	General
Liquefied (25-35)		Simple	3.28084e-05	1	0	General
Liquefied (42.5-47.5)		Simple	3.28084e-05	1	0	General
Foundation Soil Peak Strength		Simple	3.28084e-05	1	0	General

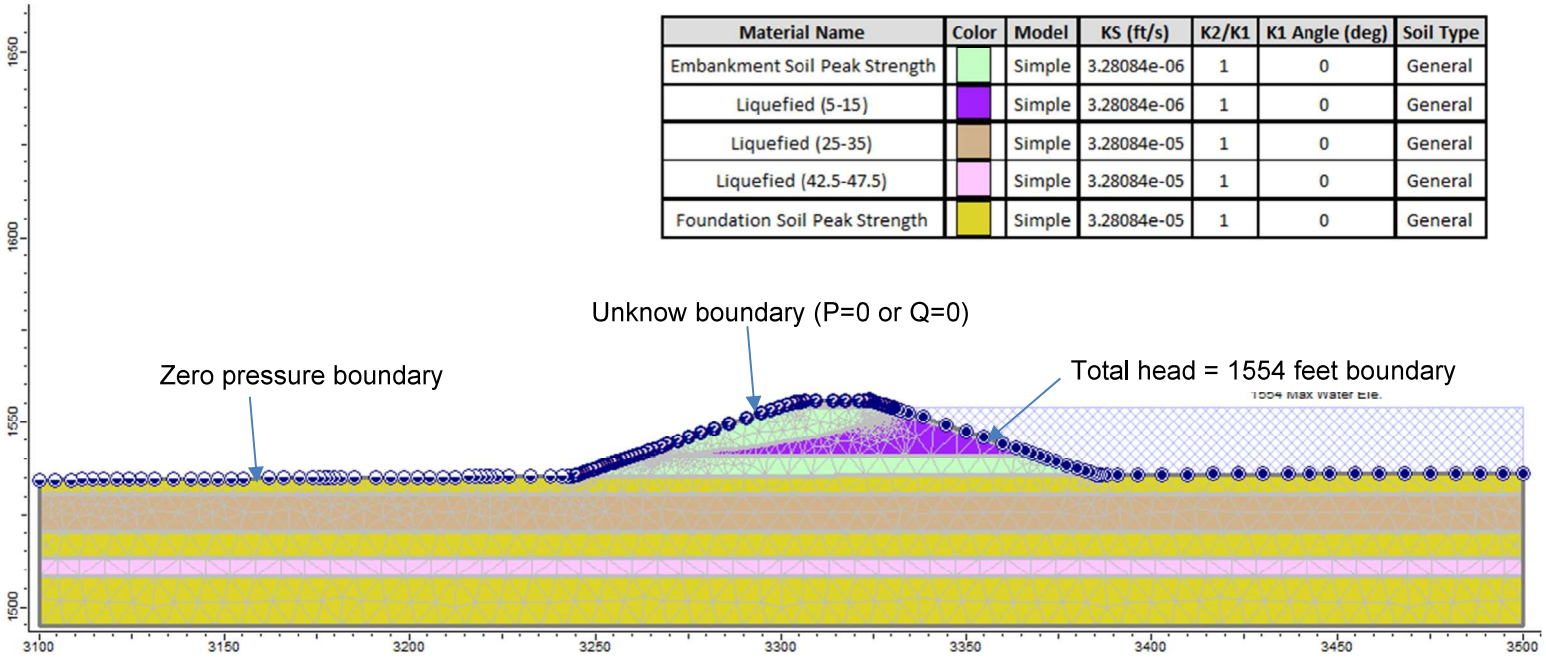


Figure D-3 Finite Element Mesh and Boundary Conditions - Case (c)

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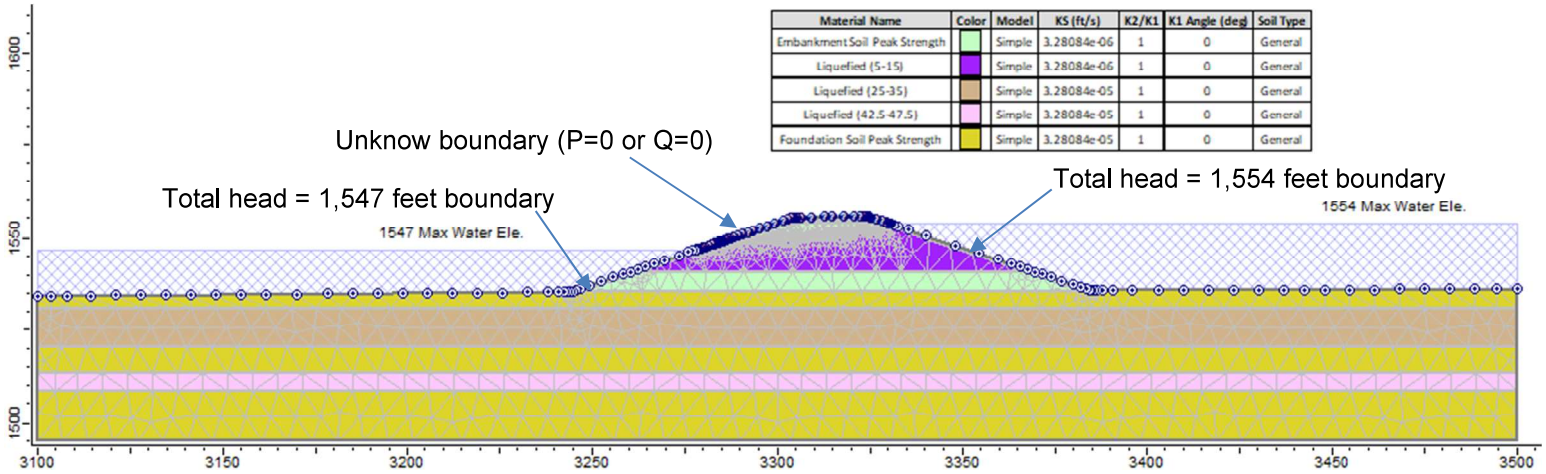


Figure D-4 Finite Element Mesh and Boundary Conditions - Case (e)

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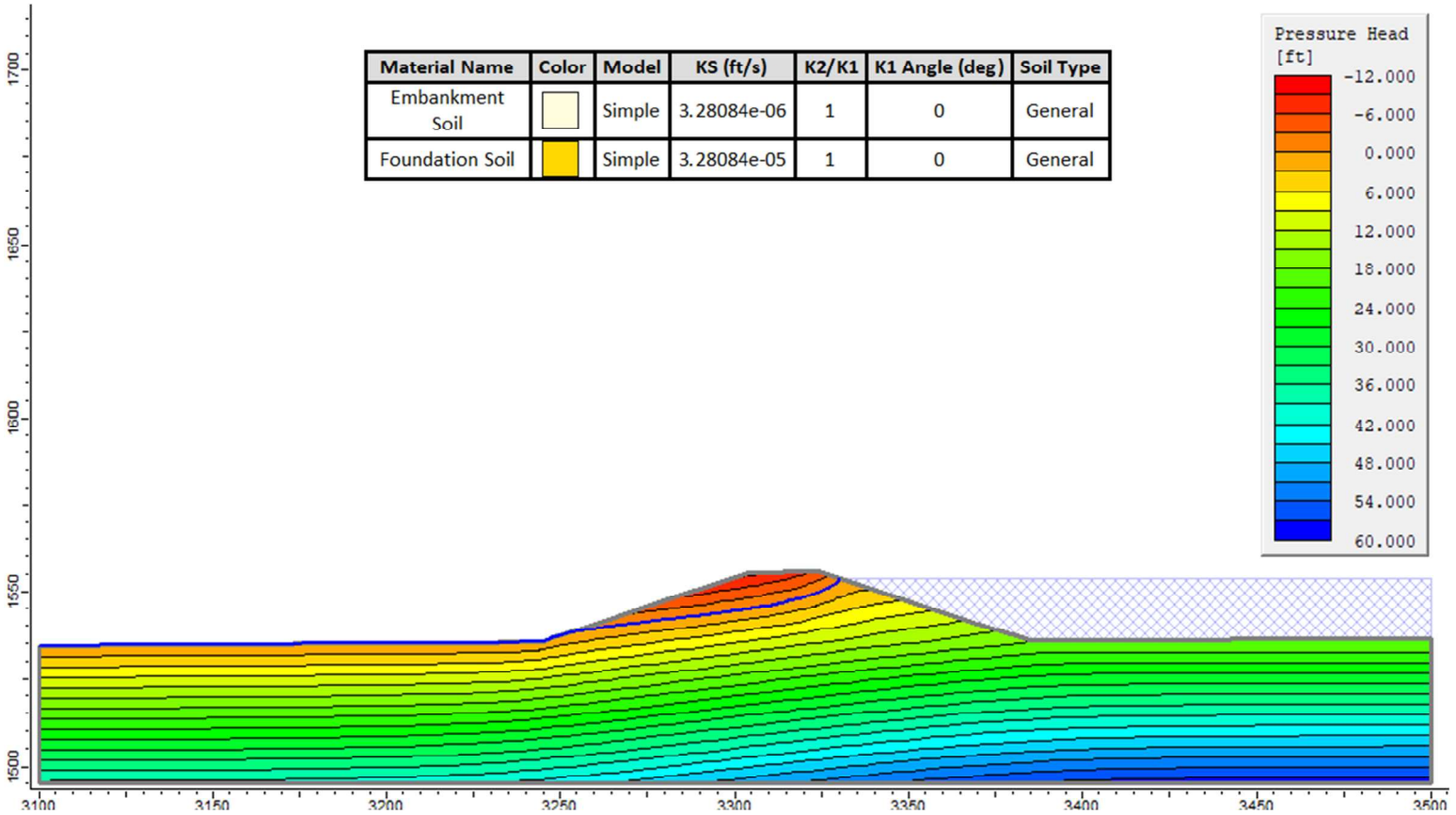


Figure D-5 Pressure Head Contours – Cases (a) and (c)

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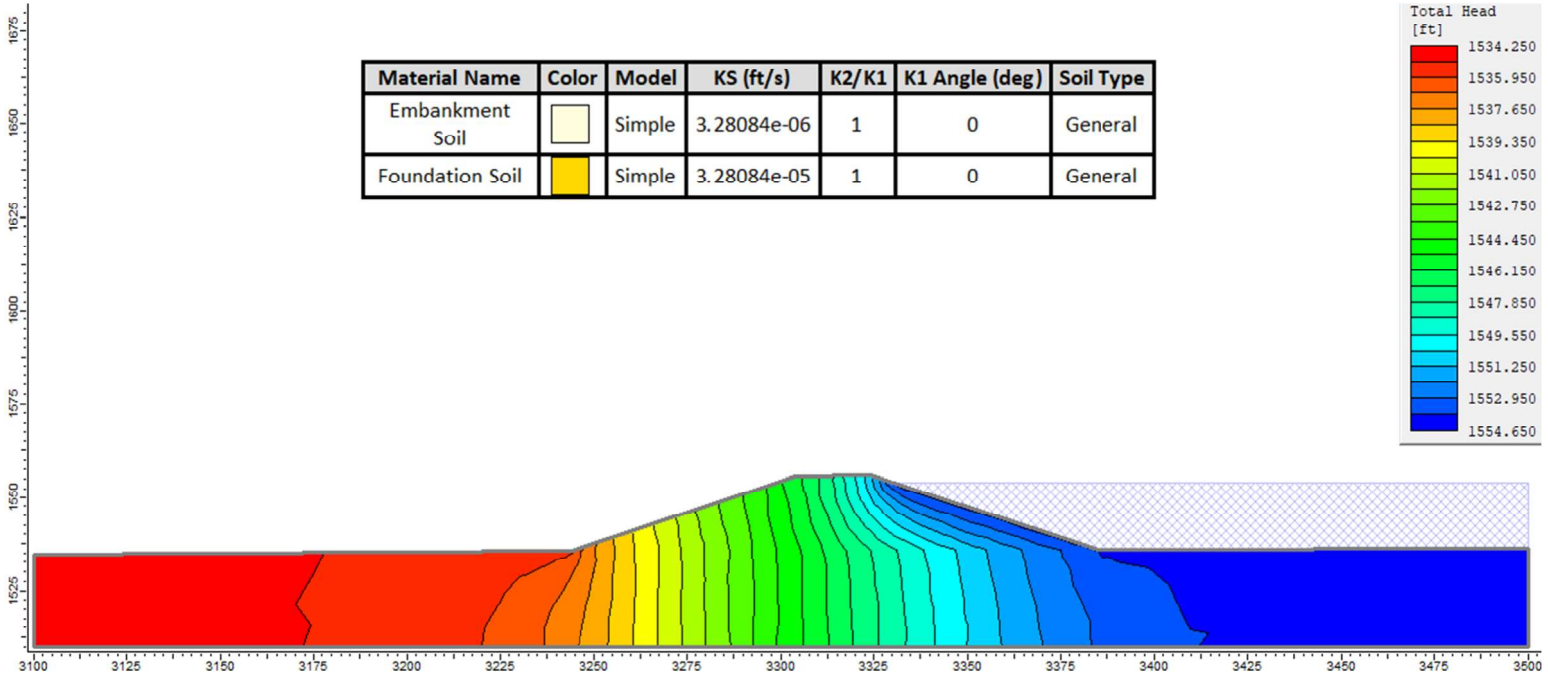


Figure D-6 Total Head Contours – Cases (a) and (c)

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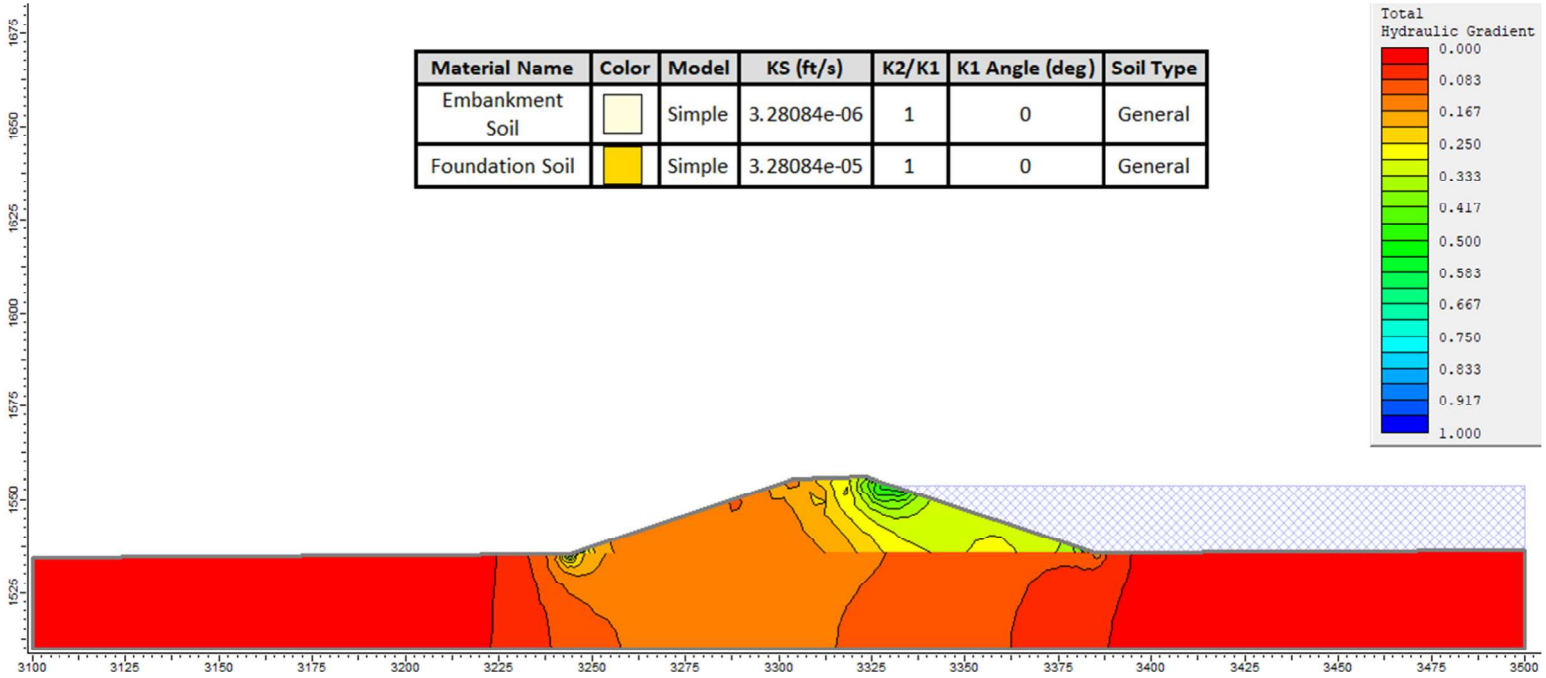
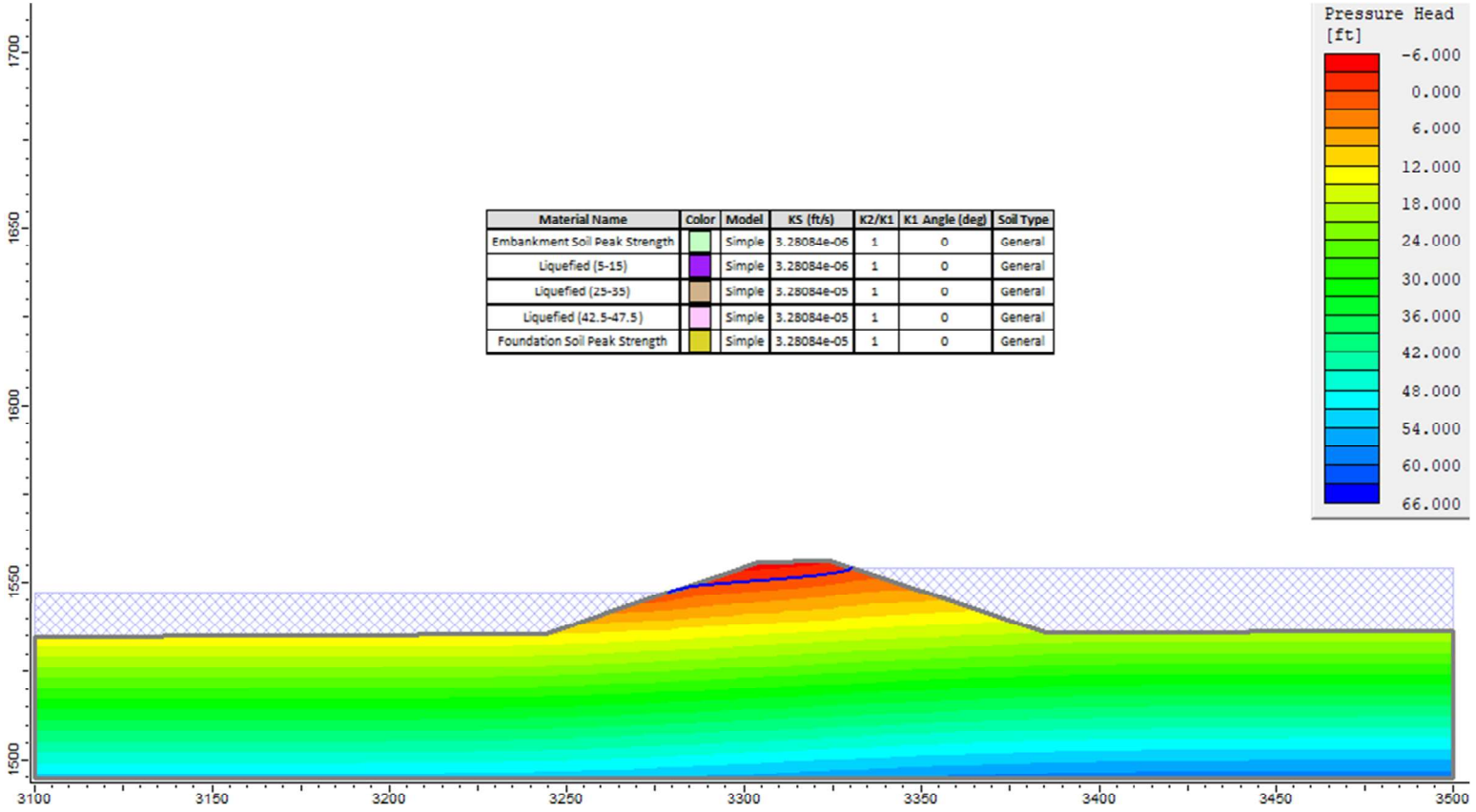


Figure D-7 Total Hydraulic Gradient Contours – Cases (a) and (c)

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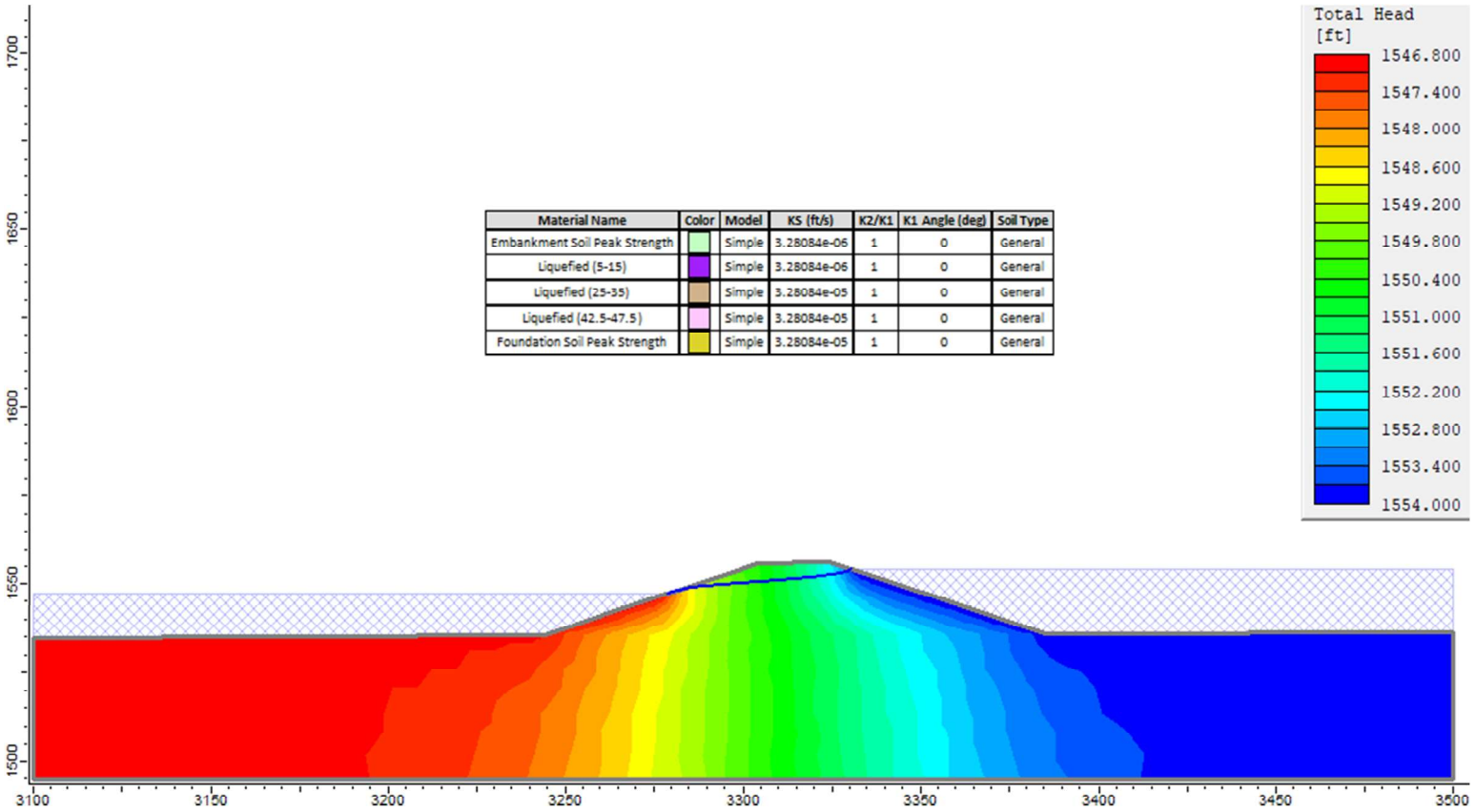
Material Name	Color	Model	KS (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil Peak Strength		Simple	3.28084e-06	1	0	General
Liquefied (5-15)		Simple	3.28084e-06	1	0	General
Liquefied (25-35)		Simple	3.28084e-05	1	0	General
Liquefied (42.5-47.5)		Simple	3.28084e-05	1	0	General
Foundation Soil Peak Strength		Simple	3.28084e-05	1	0	General

Figure D-8 Pressure Head Contours – Cases (e)

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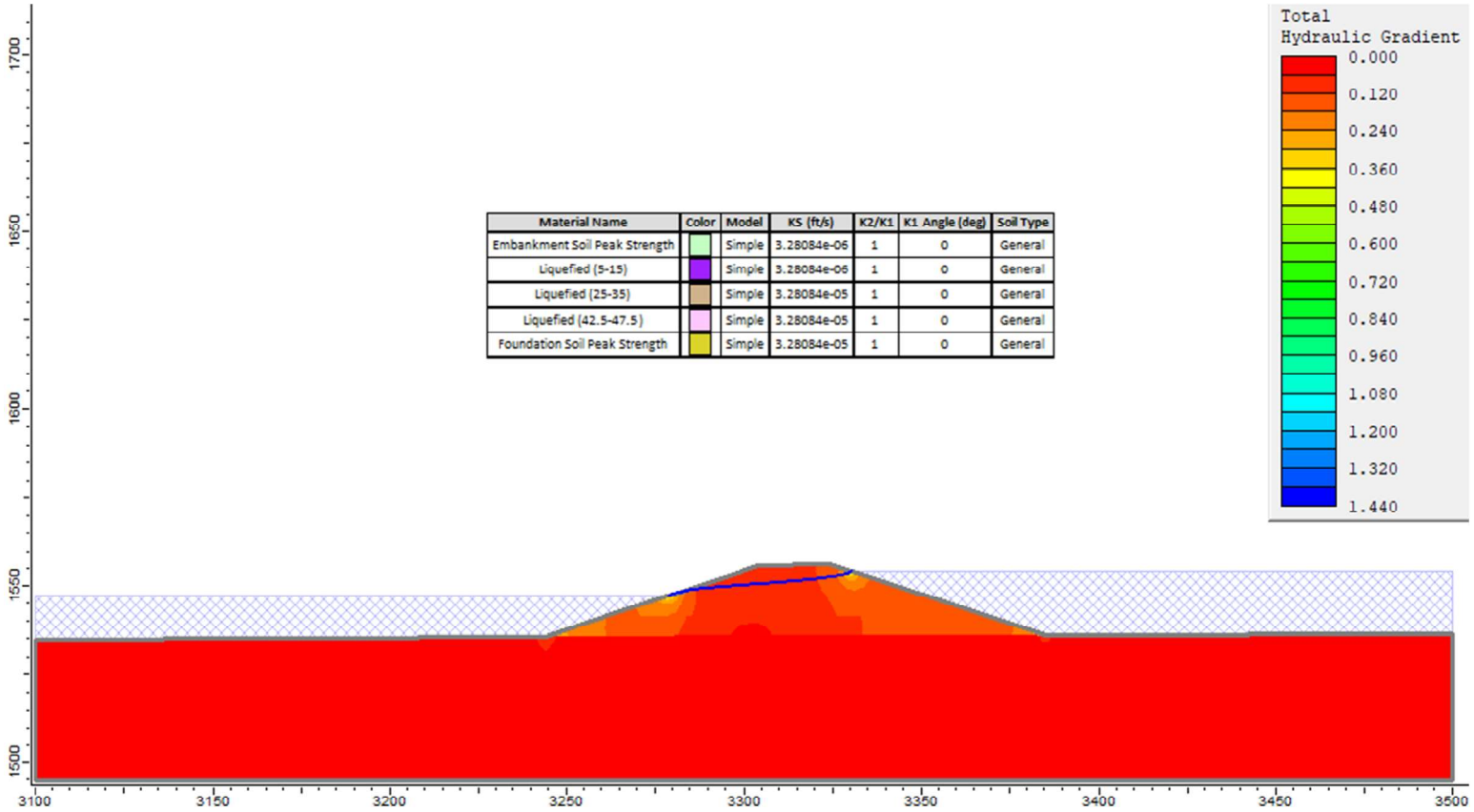
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Material Name	Color	Model	KS (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil Peak Strength		Simple	3.28084e-06	1	0	General
Liquefied (5-15)		Simple	3.28084e-06	1	0	General
Liquefied (25-35)		Simple	3.28084e-05	1	0	General
Liquefied (42.5-47.5)		Simple	3.28084e-05	1	0	General
Foundation Soil Peak Strength		Simple	3.28084e-05	1	0	General

Figure D-9 Total Head Contours – Cases (e)

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Material Name	Color	Model	Ks (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil Peak Strength		Simple	3.28084e-06	1	0	General
Liquefied (5-15)		Simple	3.28084e-06	1	0	General
Liquefied (25-35)		Simple	3.28084e-05	1	0	General
Liquefied (42.5-47.5)		Simple	3.28084e-05	1	0	General
Foundation Soil Peak Strength		Simple	3.28084e-05	1	0	General

Figure D-10 Total Hydraulic Gradient Contours – Cases (e)

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Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
Embankment Soil		130	Mohr-Coulomb	125	28
Foundation Soil		130	Mohr-Coulomb	25	31

Material Name	Color	Model	KS (ft/s)	K2/ K1	K1 Angle (deg)	Soil Type
Embankment Soil		Simple	3.28084e-06	1	0	General
Foundation Soil		Simple	3.28084e-05	1	0	General

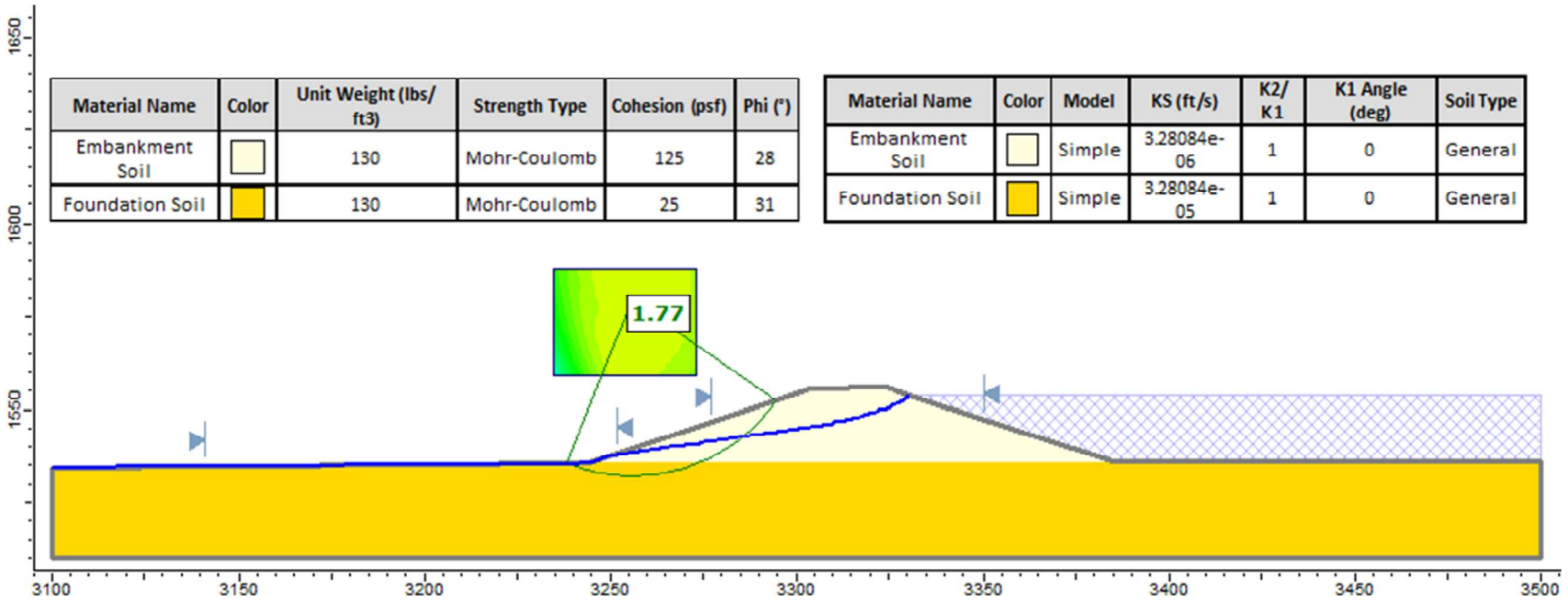


Figure D-11 Global Static Stability Analysis – Case (b)

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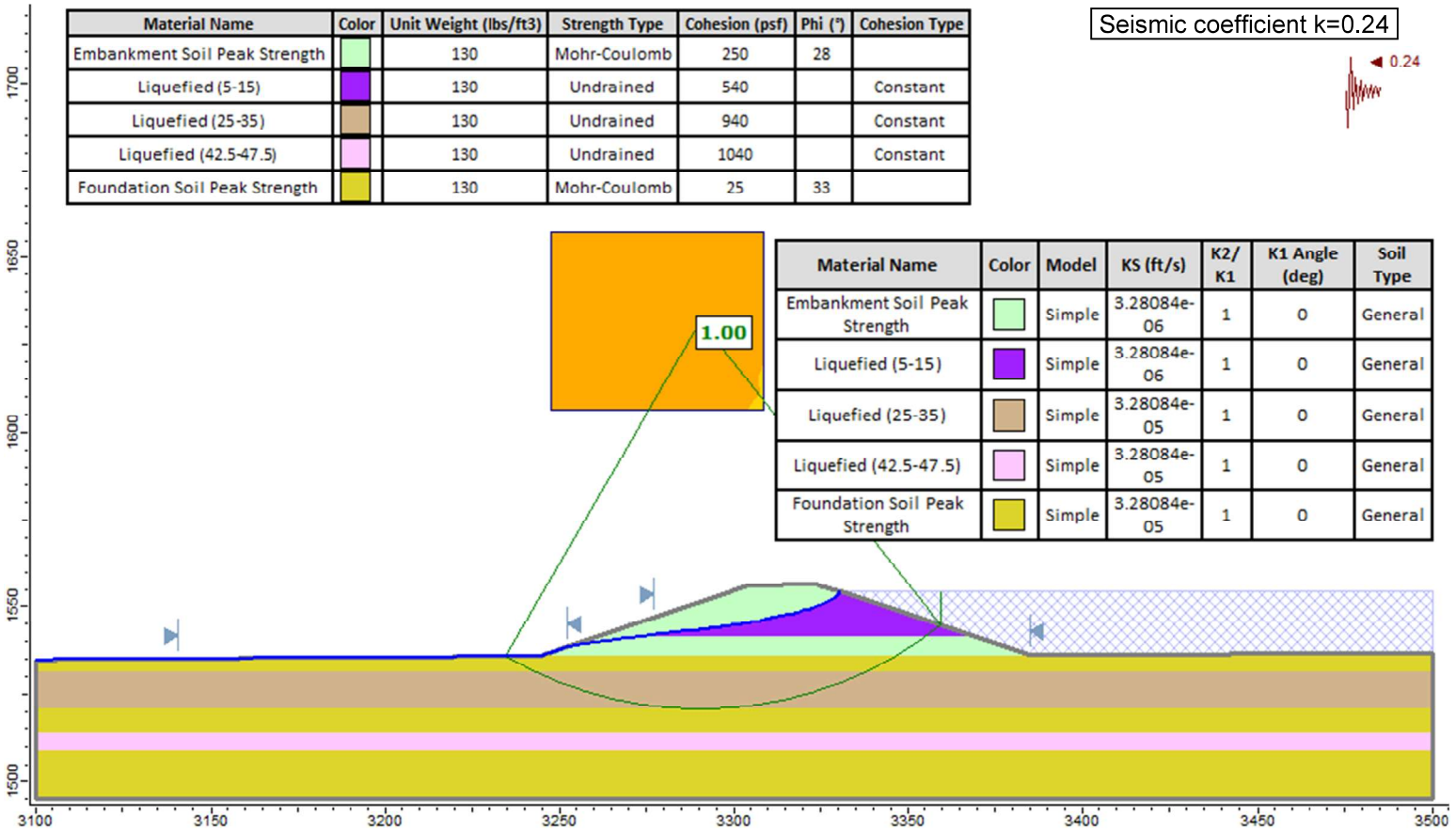
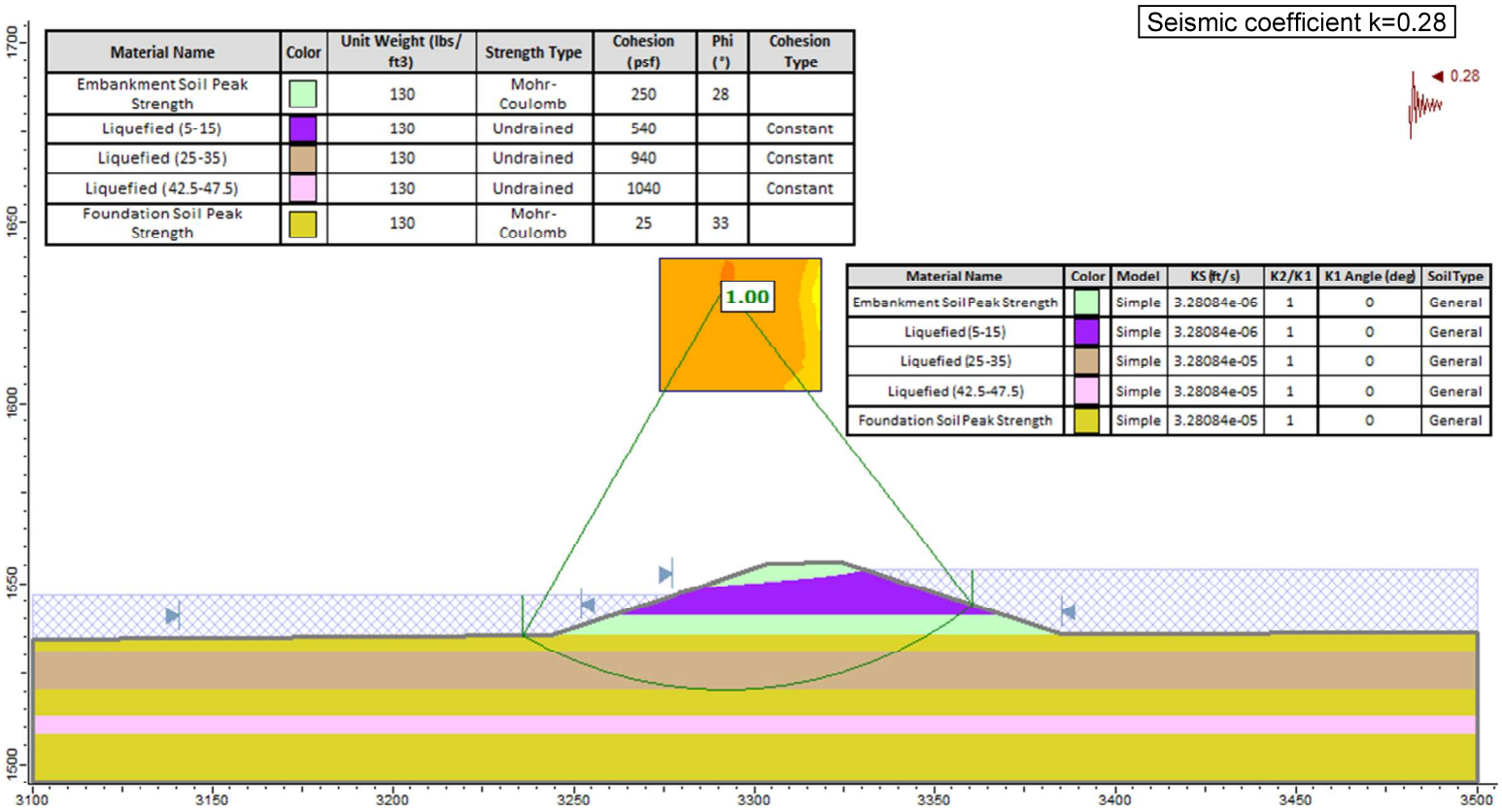


Figure D-12 Seismic Stability Analysis – Case (d)

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Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)	Cohesion Type
Embankment Soil Peak Strength		130	Mohr-Coulomb	250	28	
Liquefied (5-15)		130	Undrained	540		Constant
Liquefied (25-35)		130	Undrained	940		Constant
Liquefied (42.5-47.5)		130	Undrained	1040		Constant
Foundation Soil Peak Strength		130	Mohr-Coulomb	25	33	

Material Name	Color	Model	KS (ft/s)	K2/K1	K1 Angle (deg)	Soil Type
Embankment Soil Peak Strength		Simple	3.28084e-06	1	0	General
Liquefied (5-15)		Simple	3.28084e-06	1	0	General
Liquefied (25-35)		Simple	3.28084e-05	1	0	General
Liquefied (42.5-47.5)		Simple	3.28084e-05	1	0	General
Foundation Soil Peak Strength		Simple	3.28084e-05	1	0	General

Figure D-13 Seismic Stability Analysis – Case (f)

Appendix B

Air Quality and Greenhouse Gas Technical Memorandum

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Alessandro Ponds Optimization Phase II Project

Air Quality and Greenhouse Gas Technical Memorandum

August 13, 2026

Introduction

This Air Quality Technical Memorandum evaluates the potential air quality and greenhouse gas (GHG) impacts of the Alessandro Ponds Optimization Phase II Project (Proposed Project), to support its review under the California Environmental Quality Act (CEQA).

Project Description

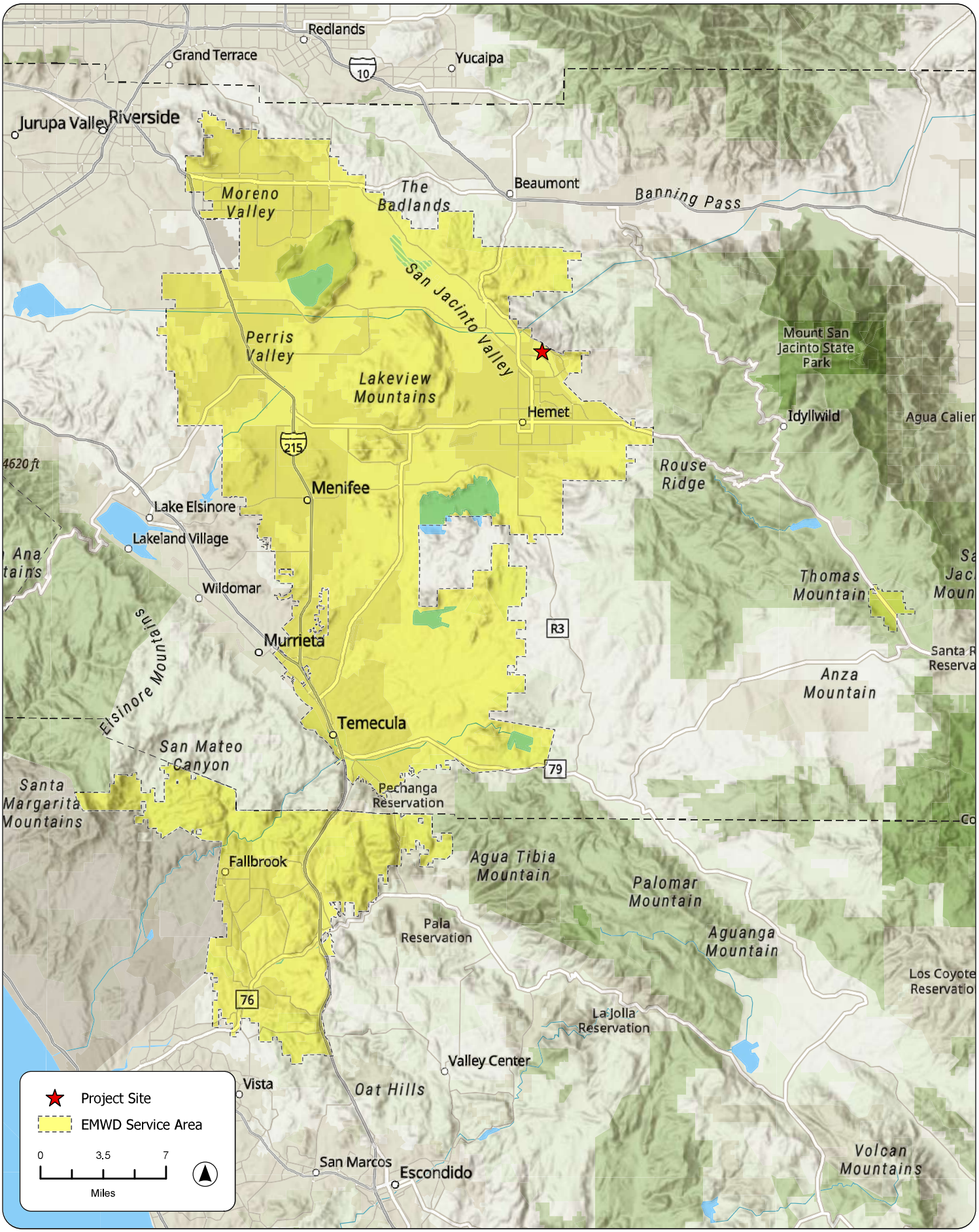
The Alessandro Ponds are an active recycled water storage facility operated by Eastern Municipal Water District (EMWD). The Project Site is approximately 37.8 acres, located partially within the City of San Jacinto, California, and partially within unincorporated Riverside County (**Figure 1** and **Figure 2**). The Proposed Project would increase the water storage capacity of the existing ponds from 172 acre-feet to 369 acre-feet through deepening, expansion, and raising of the berms. Three of the four ponds will be modified by the Proposed Project – Ponds 1, 2 and 3 (**Figure 3**). The bottom of Pond 1 would be excavated approximately 1 foot deeper through the removal of soil, while the bottom of Ponds 2 and 3 would be excavated approximately 6 to 9 feet deeper. Pond 3 would be expanded approximately 100 feet northeast towards Ponds 1 and 2. To do this, a soil stockpile currently located in this area would be removed. The height of the berms lining each pond would also be raised approximately 3 to 5 feet using soil excavated from the pond bottoms and would be stabilized with the addition of soil cement laid on the slopes. In total, approximately 120,400 cubic yards of soil would be exported off-site during construction of the Proposed Project. Existing underground pipelines and supporting infrastructure would be relocated and replaced as necessary. After completion of construction, operation activities would be consistent with the ongoing maintenance activities currently being completed for the existing ponds.

Regulatory Setting

Federal

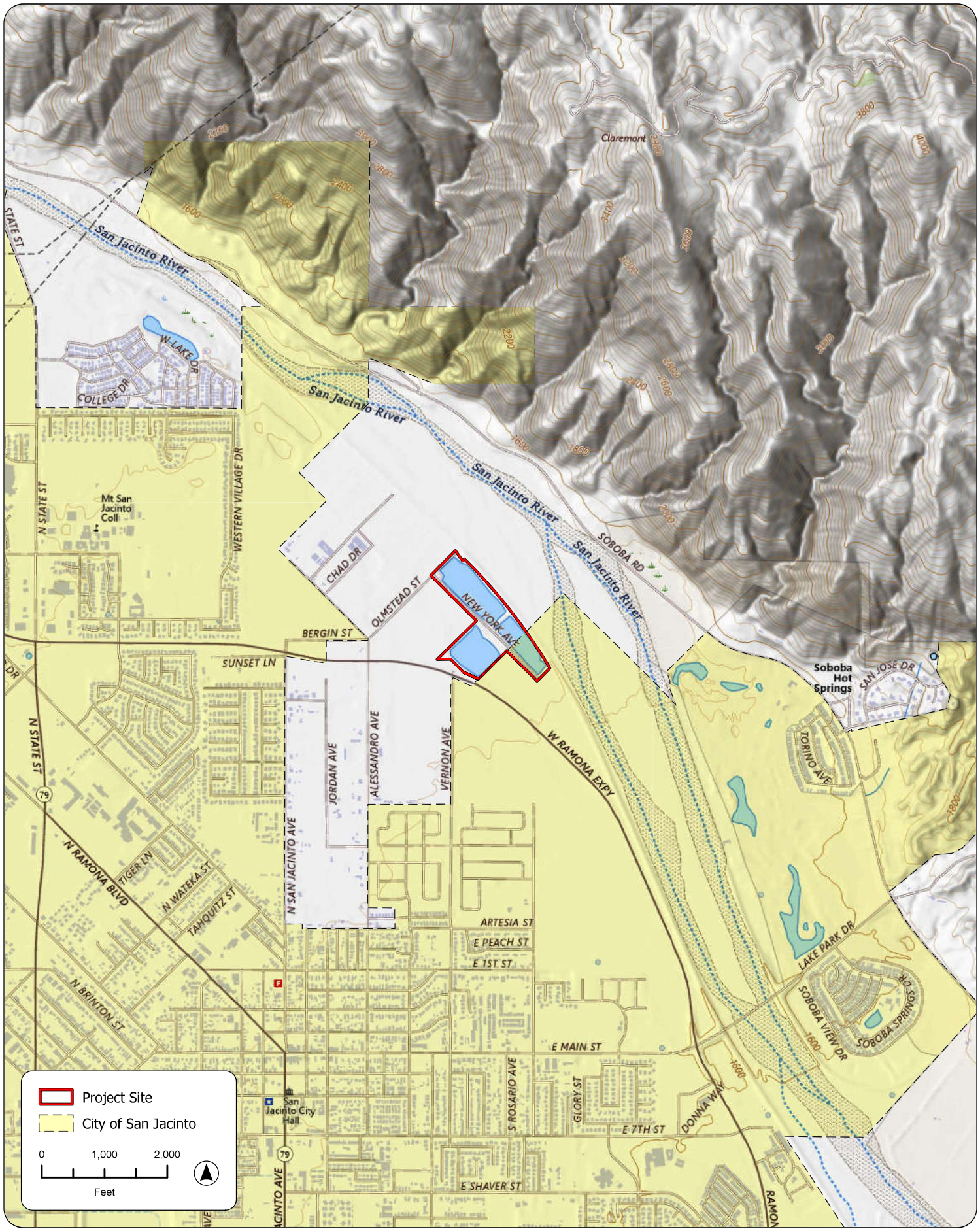
Clean Air Act (CAA)

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (USEPA) to establish health-based air quality standards at the federal level.



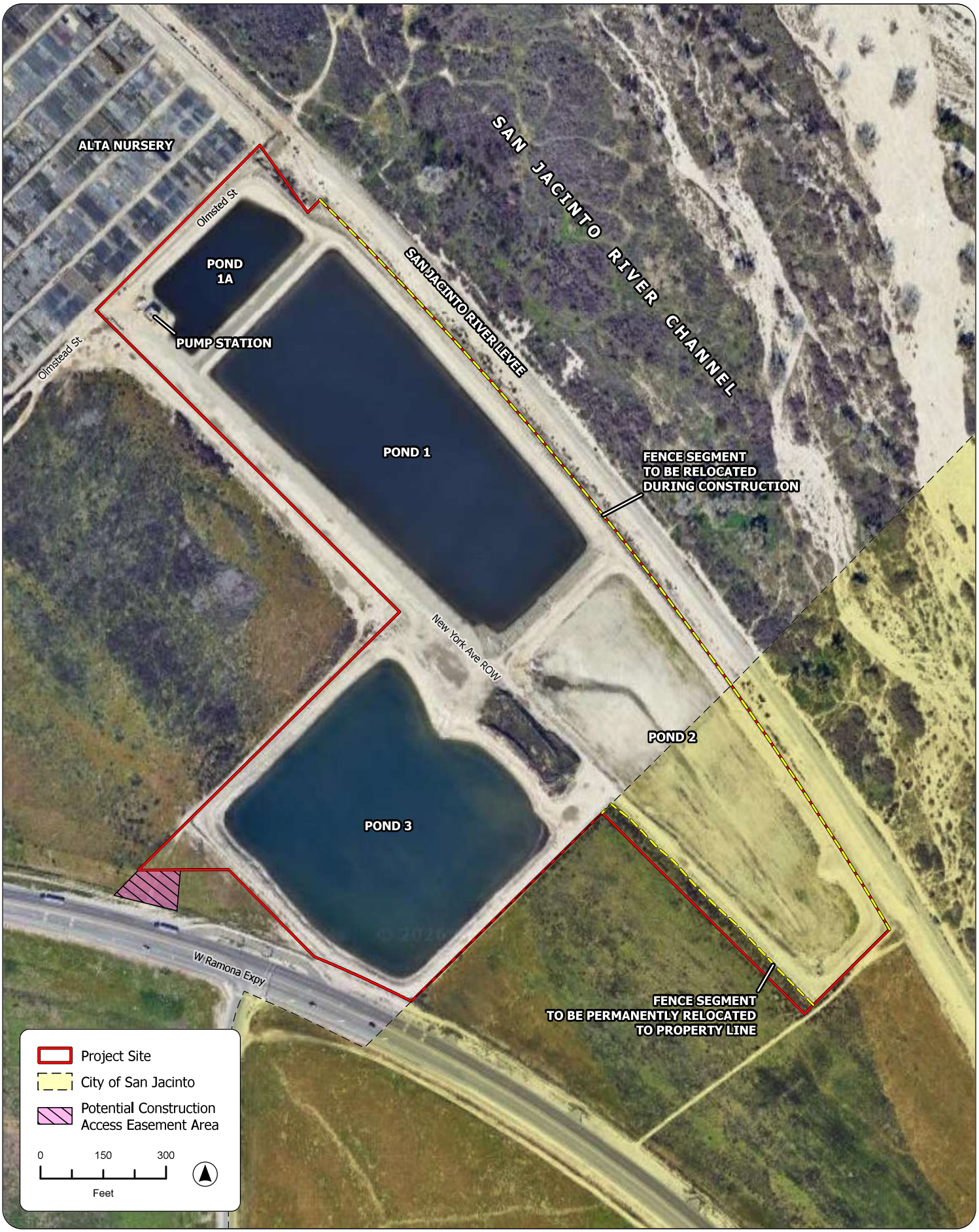
SOURCE: ESRI, 2026; Riverside County, 2026; Acorn Environmental, 5/6/2026

Figure 1
Regional Location



SOURCE: "San Jacinto, CA" USGS 7.5 Minute Topographic Quadrangle, T4S R1W, Sections 23, 24, 25, & 26, San Bernardino Baseline & Meridian; ESRI, 2026; Riverside County, 2026; Acorn Environmental, 5/4/2026

Figure 2
Site and Vicinity



SOURCE: ESRI, 2026; Vivid Aerial Photograph, 10/7/2025; Riverside County, 2026; Acorn Environmental, 5/6/2026

Figure 3
Aerial Overview

The national ambient air quality standards (NAAQS) were established for the following criteria air pollutants: ozone (O_3); carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead; and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM_{10}) and PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). Areas of the State are designated as attainment, nonattainment, maintenance, or unclassified for the various pollutant standards according to the federal CAA.

Massachusetts v. EPA, 549 U.S. 497 (2007)

In Massachusetts v. EPA, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases (GHGs) are air pollutants covered by the CAA. The Court also acknowledged that climate change is caused, in part, by human activities. The Supreme Court's ruling paved the way for the regulation of GHG emissions by the USEPA under the CAA. The USEPA has enacted regulations that address GHG emissions, including, but not limited to, mandatory GHG reporting requirements, carbon pollution standards for power plants, and air pollution standards for oil and natural gas

State

California Clean Air Act

The California CAA requires the California Air Resources Board (CARB) to establish health-based air quality standards at the State level. The California ambient air quality standards (CAAQS) were established for the following criteria air pollutants: CO, O_3, SO_2, NO_2, PM_{10}, $PM_{2.5}$, lead, sulfate, visibility reducing particles, hydrogen sulfide, and vinyl chloride. Areas of the State are designated as attainment, nonattainment, maintenance, or unclassified for the various pollutant standards according to the California CAA.

Assembly Bill (AB) 32

AB 32, the California Global Warming Solutions Act of 2006, was signed in September 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on Statewide GHG emissions. It requires that Statewide GHG emissions be reduced to 1990 levels by 2020. In December 2008, CARB adopted its Climate Change Scoping Plan (Scoping Plan) (CARB, 2008), which contains the main strategies California will implement to achieve the GHG reductions required by AB 32. The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. CARB further acknowledges that decisions about how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors.

CARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. The first update to the original 2008 Scoping Plan was approved on May 22, 2014, and expanded upon the original Scoping Plan with additional strategies and recommendations for reducing GHG emissions. The 2017 Scoping Plan '*Achieving California's 2030 Greenhouse Gas Target*' identified strategies for achieving the State's 2030 target of reducing GHG emissions to 40 percent below 1990 levels, while advancing toward the long-term goal of reducing emissions to 80 percent below 1990 levels by 2050. The 2022 Scoping Plan '*Achieving Carbon Neutrality*' established a framework for achieving carbon neutrality and reducing anthropogenic GHG emissions to 85 percent below 1990 levels no later than 2045.

Local

South Coast Air Quality Management District (SCAQMD)

SCAQMD is the regional agency responsible for regulating air quality in Southern California's South Coast Air Basin (SCAB). SCAQMD develops and enforces air quality regulations, monitors pollution levels, issues permits for emission sources, and implements regional air quality plans. Specific rules applicable to the Proposed Project may include, but are not limited to:

- **Rule 201: Permit to Construct.** This rule requires a permit prior to the construction, installation, or relocation of applicable equipment that may emit air contaminants.
- **Rule 203: Permit to Operate.** This rule requires applicable equipment that may emit air contaminants to obtain a SCAQMD Permit to Operate prior to operation.
- **Rule 401: Visible Emissions.** Establishes limits for visible emissions from stationary source.
- **Rule 402: Nuisance.** Prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
- **Rule 403: Fugitive Dust.** Aims to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.
- **Rule 431.2: Sulfur Content of Liquid Fuels.** Limits the sulfur content in diesel and other liquid fuels for the purpose of reducing the formation of oxides of sulfur (SO_X) and particulates during combustion and to enable the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur diesel, and other liquid fuels for stationary-source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile sources.
- **Rule 1110.2: Emissions from Gaseous- and Liquid-Fueled Engines.** Aims to reduce NO_X, VOC, and CO emissions from engines. This rule applies to stationary and portable engines rated at greater than 50 horsepower. Emergency engines, including those powering standby generators, are generally exempt from the emissions and monitoring requirements of this rule because they have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.

On December 5, 2008, SCAQMD adopted interim CEQA GHG significance thresholds for stationary sources using a tiered approach to determine significance. Tiers applicable to the Proposed Project include Tier 2, which evaluates whether a project is consistent with an applicable local GHG reduction plan. Tier 3 establishes a screening threshold of 10,000 metric tons of CO_2 equivalent per year (MT CO_2e/year) for determining whether a stationary source project would result in a less than significant GHG impact. While this threshold can be used for reference, it is intended primarily for industrial projects where SCAQMD serves as the lead agency (SCAQMD, 2008).

SCAQMD 2022 Air Quality Management Plan (AQMP)

The CAA requires areas that do not meet the health-based NAAQS to develop and implement an emission reduction strategy to attain healthy levels of air quality in a timely manner. The State also requires areas that do not meet the CAAQS to take all feasible measures towards achieving the CAAQS at the earliest practicable date. AQMPs provide the strategy and the underlying technical analysis for how the region

will meet federal standards by the required dates and continue progress to achieve the state standards. SCAQMD has developed six comprehensive AQMPs since the late 1990s to address updates to air quality standards and attainment deadlines. The primary purpose of the 2022 AQMP is to identify, develop, and implement strategies and control measures to attain the 2015 8-hour ozone NAAQS of 70 parts per billion (ppb) as expeditiously as practicable, but no later than the applicable statutory attainment deadlines.

Riverside County Climate Action Plan

Riverside County adopted a Climate Action Plan (CAP) in 2015 for unincorporated areas and updated it in 2019. The 2019 CAP establishes a review process for evaluating project-level GHG emissions and determining significance under CEQA. This process is streamlined by (1) applying a screening threshold for small projects that are considered less than significant and (2) using Screening Tables to identify and implement mitigation measures for projects that exceed the threshold. Projects also have the option to prepare a project-specific technical analysis to quantify and mitigate GHG emissions. Projects with emissions exceeding 3,000 MT CO_2e/year are required to use the Screening Tables or prepare a project-specific technical analysis to address GHG impacts (Riverside County, 2019).

Environmental Setting

The Project Site is located in western Riverside County (County), partially within the City of San Jacinto and partially within the unincorporated County, and lies within the SCAB, which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernadino Counties. Air quality conditions in the SCAB are under the jurisdiction of SCAQMD. According to the AQMP adopted by SCAQMD for the air basin, the worst air quality problem in the nation occurs in the SCAB. With very light average wind speeds, the basin atmosphere has a limited capability to disperse air contaminants horizontally. Furthermore, the vertical dispersal of air pollutants in the SCAB is hampered by the presence of a temperature inversion in the layers of the atmosphere near the surface of the Earth, which holds air pollutants near the ground and results in high concentrations of air pollution, especially in the inland areas of the SCAB (Riverside County, 2018).

Regional Pollutants of Concern

The greatest air quality concerns in the SCAB occur from summer through the winter months, where the basin experiences lower wind speeds, a persistent temperature inversion, and the appearance of offshore winds. In the winter, the greatest pollution problems are $PM_{2.5}$ and NO_X because of extremely low-level inversions and air stagnation during the night and early morning hours. Ozone levels are much lower during this season due to the lack of strong inversion during the daylight hours and the lack of intense sunlight which is needed to produce photochemical reactions. However, in the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between VOCs and NO_X to form more ozone. Inversions are not as low and intense in the surface boundary layer (within 100 feet of the ground) as in winter because horizontal ventilation is better in summer (Riverside County, 2018).

Attainment Status

As shown in **Table 1**, the SCAQMD portion of the County is currently designated nonattainment for State ozone, PM_{10}, and $PM_{2.5}$ standards. Furthermore, it is classified as serious nonattainment for federal $PM_{2.5}$ standards, extreme nonattainment for federal ozone standards, and attainment (maintenance) for federal CO, NO_X, and PM_{10} standards. The SCAQMD portion of the County is designated as an attainment or unclassified area for all other federal and State ambient air quality standards.

Table 1: Air Quality Attainment Status for Western Riverside County

Pollutant	CAAQS	NAAQS
Ozone (8-hour)	Nonattainment	Nonattainment (Extreme)
PM_{10} (24-hour, annual)	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$ (annual)	Nonattainment	Nonattainment (Serious)
Carbon Monoxide (8-hour, 1-hour)	Attainment	Attainment (Maintenance)
Nitrogen Dioxide (annual, 1-hour)	Attainment	Attainment (Maintenance)
Sulfur Dioxide (24-hour,1-hour)	Attainment	Attainment
Lead (30-day average)	Attainment	Attainment

Source: Source: USEPA, 2026; CARB, 2023
PM_{10}: Particulate matter with diameters that are generally 10 micrometers and smaller
$PM_{2.5}$: Particulate matter with diameters that are generally 2.5 micrometers and smaller

Sensitive Receptors

Sensitive receptors are generally defined as land uses that house or attract people who are susceptible to adverse effects from air pollution emissions. As such, sensitive resources should be given special consideration when evaluating air quality impacts from projects. Sensitive receptors include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollution. Hospitals, schools, convalescent homes, parks and recreational facilities, and residential areas are examples of sensitive receptors.

The nearest sensitive receptors to the Project Site are residences located approximately 0.24 mile west of Pond 3, and Rose-Salgado Elementary School, located approximately 0.27 mile south of Pond 3. A residential community is located immediately to the south of the school, approximately 0.38 miles south of Pond 3.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are defined as air pollutants that may cause or contribute to an increase in mortality or serious illness, or that may otherwise pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. TACs are not treated as criteria air pollutants with ambient air quality standards. Instead, the USEPA and CARB regulate TACs through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions.

Greenhouse Gases

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons and perfluorocarbons, and sulfur hexafluoride. Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are primarily determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2, CH_4, and N_2O are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off gassing are associated with agricultural practices and landfills. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. In addition to natural sources, human activities are exerting a substantial and growing influence on climate by changing the composition of the atmosphere and the ocean, and by modifying the land surface through deforestation and urbanization that reduces carbon capture and decreases albedo. GHGs are typically quantified in terms of "carbon dioxide equivalent" (CO_2e), a common measure used to compare the emissions of various GHGs based on their global warming potential. This measure is usually presented in metric tons (MT) and is expressed as MT CO_2e.

Air Quality

Methodology

Construction emissions associated with development of the Proposed Project were calculated with the California Emissions Estimator Model (CalEEMod) 2022.1 (California Air Pollution Control Officers Association [CAPCOA], 2022). Model assumptions and CalEEMod output files are provided in **Attachment A**. Construction of the Proposed Project is anticipated to begin in 2027 and take approximately 18 months to complete. Equipment assumptions used in the air quality model were provided by EMWD and are summarized in **Table 2**. In total, the model assumes the export of approximately 120,400 cubic yards of soil, which would be hauled by truck either to one or more construction sites for use as fill material or to the Lamb Canyon Landfill, located approximately 9 miles northwest of the Project Site. Due to uncertainty regarding the ultimate haul destination, a conservative haul trip length of 20 miles was used, consistent with CalEEMod default assumptions.

Table 2: Construction Equipment

Equipment	Quantity
Backhoe/Loader	2
Excavator	2
Utility Truck	1
Water Truck	1
Pump	1
Pick-Up Trucks	3
Scraper	2-3
Grader	1
Dozer	2
Roller	2
Drill Rig	1
Soil Cement Batch Plant	1

Source: EMWD Field Engineering, 2026

Because the Proposed Project is intended to increase water storage capacity at the Alessandro Ponds and is anticipated to require a similar level of operation and maintenance (O&M) activities as the existing facility, the Proposed Project would generate negligible operational emissions. Operational emissions are therefore not quantified.

Thresholds of Significance

Western Riverside County is currently in nonattainment for ozone, PM_{10}, and $PM_{2.5}$ State standards. The SCAQMD establishes significance thresholds to assess the regional impact of project-related air pollutant emissions in the SCAQMD, presented in **Table 3**. A project with emissions rates below these thresholds would not result in a cumulatively considerable increase of any criteria pollutant and is considered to have a less than significant impact on air quality.

Table 3: SCAQMD Air Quality Thresholds of Significance (Construction)

Criteria Pollutant	Emissions Threshold (lbs./day)
NO_X	100
VOC	75
PM_{10}	150
$PM_{2.5}$	55
SO_X	150
CO	550
Lead	3

Source: SCAQMD, 2023

Impact Assessment

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant. The SCAQMD portion of the County where the Project Site is located is currently designated nonattainment for State ozone, PM_{10}, and $PM_{2.5}$ standards. Furthermore, it is designated serious nonattainment for federal $PM_{2.5}$ standards, extreme nonattainment for federal ozone standards, and attainment (maintenance) for federal CO, NO_X, and PM_{10} standards. The 2022 AQMP serves as the applicable air quality plan for the region. As such, inconsistency with the 2022 AQMP would be considered a cumulatively adverse air quality impact. SCAQMD is responsible for formulating and implementing the air quality plan for the basin. The applicable plan is the 2022 AQMP, which is intended to attain the 2015 8-hour ozone standard of 70 ppb. Consistency with the AQMP is evaluated based on whether a project complies with applicable SCAQMD rules and regulations and aligns with regional growth projections used in the AQMP, which are based on population, housing, and employment forecasts. The Proposed Project involves expansion of an existing recycled water facility and would not induce population growth, either directly or indirectly. Therefore, the Proposed Project would be consistent with growth projections contained in the County's General Plan and the AQMP. Based on these considerations, and pursuant to SCAQMD guidance, the Proposed Project would not conflict with or obstruct implementation of the AQMP, and impacts would be less than significant.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less than Significant. Project-specific emissions that exceed SCAQMD thresholds of significance for criteria pollutants would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the County is in nonattainment under applicable federal or state ambient air quality standards. Construction is anticipated to begin in 2027 and last for up to 18 months. The Proposed Project would result in construction emissions during pond deepening and soil export, berm raising, and pipeline replacement; however, these emissions would be temporary and limited in scale. The Proposed Project's

construction emissions would include those associated with off-road heavy equipment operation, worker vehicle commutes, and haul truck activity for the export of approximately 120,400 CY of excavated soil. The Proposed Project would include temporary use of a soil-cement batch plant and associated generator during construction. In accordance with SCAQMD Rules 201 and 203, a Permit to Construct and a Permit to Operate would be obtained for the batch plant prior to operation, and the equipment would be operated in accordance with applicable permit requirements. Results of the CalEEMod analysis are shown in **Table 4** and further detailed in **Attachment A**. Construction emissions generated by the Proposed Project would be less than the applicable SCAQMD thresholds for criteria pollutants. Therefore, construction impacts would be less than significant.

Table 4: Project Construction Emissions (lbs./day)

Summary Report	NO_X	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$
2027	46.97	5.16	48.67	0.12	19.94	9.17
2028	45.01	5.06	48.33	0.12	19.85	9.09
Maximum Daily Emissions	**46.97**	**5.16**	**48.67**	**0.12**	**19.94**	**9.17**
SCAQMD Threshold	*100*	*75*	*550*	*150*	*150*	*55*
Threshold Exceeded?	No	No	No	No	No	No

Source: **Attachment A**

Once constructed, the Proposed Project is anticipated to have the same level of O&M activities as the existing ponds. Therefore, the Proposed Project is not expected to generate increased levels of operational emissions beyond existing conditions, and impacts would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant. The nearest sensitive receptors to the Project Site are residences located approximately 0.24 miles west of Pond 3, and the Rose-Salgado Elementary School, located approximately 0.27 miles south of Pond 3. A residential community is located immediately to the south of the school, approximately 0.38 miles south of Pond 3. During construction, sensitive receptors may be affected by the temporary generation of fugitive dust emissions. Compliance with SCAQMD Rule 403, which requires implementation of fugitive dust control measures during construction and is enforced by SCAQMD staff, would reduce these impacts. As discussed in **Impact b**), the Proposed Project's construction and operational emissions are below SCAQMD thresholds of significance for all criteria air pollutants and would not result in a significant impact to nearby sensitive receptors.

Toxic Air Contaminants

Construction-related activities could result in the generation of TACs, specifically diesel particulate matter (DPM), from haul trucks and off-road equipment exhaust emissions, with the potential to affect nearby sensitive receptors. However, construction would be temporary, lasting only 18 months, which is a relatively short duration compared to the long-term exposure periods (e.g., 30 years or more) typically associated with health risk impacts from TACs. Equipment utilized during construction would be required to comply with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation, which limits idling and mandates construction fleets reduce emissions by phasing out older high-emitting diesel vehicles, thereby reducing emissions of DPM. Further, because construction equipment would operate intermittently and in different locations, DPM emissions would not be concentrated in one area or persist for extended time periods. Given the temporary nature of construction and the relatively short duration of potential

exposure, the potential for any one sensitive receptor in the area to experience prolonged pollutant exposure is low. Additionally, the Proposed Project, which involves passive recycled water storage, does not include operational activities that would be considered substantial sources of TACs. Therefore, the Proposed Project would not expose sensitive receptors to significant pollutant concentrations during construction or operation. There would be a less-than-significant impact.

d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?

Less than Significant. The potential for an odor impact is dependent on a number of variables, including the nature of the odor source, distance between the receptor and odor source, and local meteorological conditions. During construction, diesel equipment may generate some nuisance odors from equipment exhaust. Sensitive receptors near the Project Site include residences and the Rose Salgado Elementary School, located approximately 0.24 mile west and 0.27 mile south, respectively. However, exposure to odors associated with construction activities would be short-term and temporary in nature. In addition, construction activities within the Project Site would be required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a public nuisance. Further, per CARB's Airborne Toxic Control Measures 13 (California Code of Regulations Chapter 10 § 2485), equipment idling time is restricted to five minutes unless more time is required per engine manufacturers' specifications or for safety reasons. Compliance with this regulation would reduce odors from equipment exhaust. Given the short-term nature of construction, compliance with SCAQMD Rule 402, and the distance to the nearest sensitive receptors, project construction would not generate odors that would affect a substantial number of people, and construction impacts would be less than significant.

The Proposed Project does not include any uses typically associated with odor complaints such as dairies or composting facilities (SCAQMD, 2005). Further, the ponds in their existing condition are storing recycled water; the Proposed Project would increase the capacity but would not change the type or quality of water being stored. There would be no operational sources of odors associated with the Proposed Project, as the proposed improvements involve passive recycled water storage and would not introduce new odor-generating processes or activities. Therefore, operation of the Proposed Project would not generate substantial odors that would adversely affect a substantial number of people. Impacts would be less than significant.

Greenhouse Gas

Methodology

Construction GHG emissions associated with development of the Proposed Project were calculated using CalEEMod version 2022.1 (CAPCOA, 2022). The same modeling inputs and assumptions were utilized as discussed under the ***Air Quality Methodology*** section, above. The 2019 Riverside County CAP establishes a screening threshold of 3,000 MT CO_2e per year for small projects. Projects below this threshold are considered less than significant. Based on guidance from the SCAQMD, total construction GHG emissions resulting from a project should be amortized over the lifetime of a project, which is defined as 30 years (SCAQMD, 2008).

Impact Assessment

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant. As detailed above, the 2019 Riverside County CAP establishes a screening threshold of 3,000 MT CO_2e/year to identify small projects that are considered less than significant and would not require mitigation. GHG emissions associated with the Proposed Project would result primarily from construction activities and would involve emissions from off-road heavy equipment operation, worker vehicle commutes, and haul truck activity for the export of approximately 120,400 CY of excavated soil. The Proposed Project is not expected to generate operational GHG emissions, as it involves passive water storage and would not require increased levels of O&M activities. Consequently, operational emissions were not quantified and there are no emissions to compare against established thresholds. Total GHG emissions from the Proposed Project's two-year construction duration are detailed in **Table 5** and are approximately 2,485.72 MT CO_2e total or 82.86 MT CO_2e amortized, below the 3,000 MT CO_2e/year screening threshold established by the Riverside County CAP. Accordingly, impacts would be less than significant and no mitigation is required.

Table 5: Total Estimated Construction GHG Emissions (MT CO_2e/year)

Summary Report	Emissions
2027	1,644.08
2028	841.64
Total Construction Emissions	2,485.72
Amortized Construction Emissions	*82.86*
2019 Riverside CAP Threshold	*3,000*
Thresholds Exceeded?	No

Source: **Attachment A**

b) Conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

No Impact. As discussed above, the Proposed Project would result in construction GHG emissions below the 3,000 MT CO_2e/year screening threshold, as established by the Riverside County CAP, and negligible operational GHG emissions. As such, the Proposed Project would not result in emissions that would adversely affect state-wide attainment of GHG emission reduction goals as described in AB 32 and SB 32. Project emissions would therefore have a less than cumulatively considerable contribution to global climate change impacts, and the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. No impact would occur.

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Attachment A

CalEEMod Output Files

Alessandro Ponds Optimization Phase II Project Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Alessandro Ponds Optimization Phase II Project
Construction Start Date	1/4/2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50000
Precipitation (days)	22.4000
Location	33.803271024513194, -116.9503862618948
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5573
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.44

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Other Non-Asphalt Surfaces	37.7500	Acre	37.7500	0.00000	—	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.20402	5.16212	46.7999	48.6711	0.12071	1.84414	18.0930	19.9371	1.70116	7.47018	9.17134	—	14,196.2	14,196.2	0.50095	0.55971	7.29357	14,382.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.19259	5.15047	46.9666	48.1187	0.12071	1.84414	18.0930	19.9371	1.70116	7.47018	9.17134	—	14,159.8	14,159.8	0.50151	0.56058	0.18933	14,339.6
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.30861	3.58483	32.6925	33.5102	0.08358	1.28409	12.7466	14.0307	1.18449	5.29987	6.48436	—	9,804.62	9,804.62	0.34760	0.38545	2.17118	9,930.35
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.78632	0.65423	5.96638	6.11561	0.01525	0.23435	2.32626	2.56060	0.21617	0.96723	1.18340	—	1,623.27	1,623.27	0.05755	0.06382	0.35946	1,644.08

2.2. Construction Emissions by Year

2.2.1. Total Construction Emissions by Year, Unmitigated

Includes both onsite and offsite emissions.

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.20402	5.16212	46.7999	48.6711	0.12070	1.84414	18.0930	19.9371	1.70116	7.47018	9.17134	—	14,196.2	14,196.2	0.50095	0.55971	7.29357	14,382.8
2028	6.08102	5.05869	44.8591	48.3293	0.12071	1.75735	18.0930	19.8503	1.62132	7.47018	9.09150	—	14,122.0	14,122.0	0.49871	0.55971	6.67339	14,307.9
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	6.19259	5.15047	46.9666	48.1187	0.12070	1.84414	18.0930	19.9371	1.70116	7.47018	9.17134	—	14,159.8	14,159.8	0.50151	0.56058	0.18933	14,339.6
2028	6.05587	5.04704	45.0084	47.8161	0.12071	1.75735	18.0930	19.8503	1.62132	7.47018	9.09150	—	14,086.4	14,086.4	0.49948	0.55971	0.17338	14,265.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	4.30861	3.58483	32.6925	33.5102	0.08358	1.28409	12.7466	14.0307	1.18449	5.29987	6.48436	—	9,804.62	9,804.62	0.34760	0.38545	2.17118	9,930.35
2028	2.15731	1.79831	16.0366	17.0586	0.04299	0.62591	6.43850	7.06440	0.57746	2.65922	3.23667	—	5,018.65	5,018.65	0.17790	0.19935	1.02663	5,083.53
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.78632	0.65423	5.96638	6.11561	0.01525	0.23435	2.32626	2.56060	0.21617	0.96723	1.18340	—	1,623.27	1,623.27	0.05755	0.06382	0.35946	1,644.08
2028	0.39371	0.32819	2.92667	3.11319	0.00785	0.11423	1.17503	1.28925	0.10539	0.48531	0.59069	—	830.895	830.895	0.02945	0.03300	0.16997	841.637

2.2.2. Onsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.91848	4.97181	43.5062	45.5411	0.10012	1.78726	16.8331	18.6204	1.64428	7.13828	8.78255	—	10,797.4	10,797.4	0.43799	0.08760	0.00000	10,834.4
2028	5.80089	4.87301	41.6555	45.3754	0.10012	1.70047	16.8331	18.5336	1.56443	7.13828	8.70271	—	10,797.4	10,797.4	0.43799	0.08760	0.00000	10,834.5
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	5.91848	4.97181	43.5062	45.5411	0.10012	1.78726	16.8331	18.6204	1.64428	7.13828	8.78255	—	10,797.4	10,797.4	0.43799	0.08760	0.00000	10,834.4
2028	5.80089	4.87301	41.6555	45.3754	0.10012	1.70047	16.8331	18.5336	1.56443	7.13828	8.70271	—	10,797.4	10,797.4	0.43799	0.08760	0.00000	10,834.5

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	4.11798	3.45932	30.2916	31.6741	0.06942	1.24501	11.8886	13.1336	1.14541	5.07375	6.21916	—	7,486.92	7,486.92	0.30370	0.06074	0.00000	7,512.61
2028	2.06607	1.73559	14.8362	16.1611	0.03566	0.60565	5.99536	6.60101	0.55719	2.54240	3.09959	—	3,845.66	3,845.66	0.15600	0.03120	0.00000	3,858.86
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.75153	0.63133	5.52822	5.78053	0.01267	0.22721	2.16966	2.39688	0.20904	0.92596	1.13500	—	1,239.54	1,239.54	0.05028	0.01006	0.00000	1,243.80
2028	0.37706	0.31675	2.70760	2.94940	0.00651	0.11053	1.09415	1.20468	0.10169	0.46399	0.56568	—	636.693	636.693	0.02583	0.00517	0.00000	638.878

2.2.3. Offsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.28554	0.19031	3.29367	3.13001	0.02058	0.05689	1.25986	1.31675	0.05689	0.33190	0.38879	—	3,398.80	3,398.80	0.06297	0.47211	7.29357	3,548.35
2028	0.28014	0.18568	3.20364	2.95386	0.02058	0.05689	1.25986	1.31675	0.05689	0.33190	0.38879	—	3,324.56	3,324.56	0.06072	0.47211	6.67339	3,473.44
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.27411	0.17866	3.46041	2.57758	0.02058	0.05689	1.25986	1.31675	0.05689	0.33190	0.38879	—	3,362.45	3,362.45	0.06352	0.47298	0.18933	3,505.18
2028	0.25498	0.17403	3.35293	2.44073	0.02058	0.05689	1.25986	1.31675	0.05689	0.33190	0.38879	—	3,288.99	3,288.99	0.06149	0.47211	0.17338	3,431.39
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.19063	0.12552	2.40088	1.83603	0.01416	0.03909	0.85803	0.89712	0.03909	0.22612	0.26520	—	2,317.70	2,317.70	0.04389	0.32471	2.17118	2,417.74
2028	0.09124	0.06272	1.20037	0.89747	0.00733	0.02026	0.44314	0.46340	0.02026	0.11682	0.13708	—	1,172.99	1,172.99	0.02190	0.16815	1.02663	1,224.68
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.03479	0.02291	0.43816	0.33508	0.00258	0.00713	0.15659	0.16372	0.00713	0.04127	0.04840	—	383.723	383.723	0.00727	0.05376	0.35946	400.284
2028	0.01665	0.01145	0.21907	0.16379	0.00134	0.00370	0.08087	0.08457	0.00370	0.02132	0.02502	—	194.203	194.203	0.00363	0.02784	0.16997	202.759

3. Construction Emissions Details

3.1. Site Preparation (2027)

3.1.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.34413	1.96972	17.9878	17.5786	0.03082	0.76127	—	0.76127	0.70037	—	0.70037	—	3,338.34	3,338.34	0.13542	0.02708	—	3,349.79
Dust From Material Movement	—	—	—	—	—	—	13.1047	13.1047	—	6.73496	6.73496	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06422	0.05397	0.49282	0.48160	0.00084	0.02086	—	0.02086	0.01919	—	0.01919	—	91.4613	91.4613	0.00371	0.00074	—	91.7752
Dust From Material Movement	—	—	—	—	—	—	0.35903	0.35903	—	0.18452	0.18452	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.01172	0.00985	0.08994	0.08789	0.00015	0.00381	—	0.00381	0.00350	—	0.00350	—	15.1425	15.1425	0.00061	0.00012	—	15.1944
Dust From Material Movement	—	—	—	—	—	—	0.06552	0.06552	—	0.03367	0.03367	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.1.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04288	0.03792	0.03924	0.50210	0.00000	0.00000	0.13071	0.13071	0.00000	0.03064	0.03064	—	124.489	124.489	0.00176	0.00474	0.01091	125.956
Vendor	0.01314	0.00578	0.32293	0.09987	0.00225	0.00450	0.08556	0.09006	0.00450	0.02364	0.02814	—	295.739	295.739	0.00670	0.04427	0.01955	309.118
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00117	0.00104	0.00119	0.01444	0.00000	0.00000	0.00353	0.00353	0.00000	0.00083	0.00083	—	3.45381	3.45381	0.00005	0.00013	0.00497	3.49869
Vendor	0.00037	0.00016	0.00883	0.00270	0.00006	0.00012	0.00232	0.00244	0.00012	0.00064	0.00076	—	8.09887	8.09887	0.00019	0.00121	0.00890	8.47394
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00021	0.00019	0.00022	0.00264	0.00000	0.00000	0.00064	0.00064	0.00000	0.00015	0.00015	—	0.57182	0.57182	0.00001	0.00002	0.00082	0.57925
Vendor	0.00007	0.00003	0.00161	0.00049	0.00001	0.00002	0.00042	0.00045	0.00002	0.00012	0.00014	—	1.34086	1.34086	0.00003	0.00020	0.00147	1.40296
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2. Grading (2027)

3.2.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.91848	4.97181	43.5062	45.5411	0.10012	1.78726	—	1.78726	1.64428	—	1.64428	—	10,797.4	10,797.4	0.43799	0.08760	—	10,834.4
Dust From Material Movement	—	—	—	—	—	—	16.8331	16.8331	—	7.13828	7.13828	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.91848	4.97181	43.5062	45.5411	0.10012	1.78726	—	1.78726	1.64428	—	1.64428	—	10,797.4	10,797.4	0.43799	0.08760	—	10,834.4
Dust From Material Movement	—	—	—	—	—	—	16.8331	16.8331	—	7.13828	7.13828	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	4.05376	3.40535	29.7988	31.1925	0.06857	1.22415	—	1.22415	1.12622	—	1.12622	—	7,395.46	7,395.46	0.29999	0.06000	—	7,420.84
Dust From Material Movement	—	—	—	—	—	—	11.5295	11.5295	—	4.88923	4.88923	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.73981	0.62148	5.43828	5.69264	0.01251	0.22341	—	0.22341	0.20553	—	0.20553	—	1,224.40	1,224.40	0.04967	0.00993	—	1,228.60
Dust From Material Movement	—	—	—	—	—	—	2.10414	2.10414	—	0.89228	0.89228	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15780	0.14043	0.12153	2.32488	0.00000	0.00000	0.45748	0.45748	0.00000	0.10723	0.10723	—	473.752	473.752	0.00540	0.01659	1.47179	480.302
Vendor	0.01336	0.00622	0.30909	0.09700	0.00225	0.00450	0.08556	0.09006	0.00450	0.02364	0.02814	—	295.514	295.514	0.00692	0.04427	0.75247	309.632
Hauling	0.11438	0.04366	2.86305	0.70812	0.01834	0.05239	0.71682	0.76921	0.05239	0.20103	0.25342	—	2,629.53	2,629.53	0.05064	0.41125	5.06931	2,758.42
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15008	0.13272	0.13735	1.75736	0.00000	0.00000	0.45748	0.45748	0.00000	0.10723	0.10723	—	435.711	435.711	0.00617	0.01659	0.03817	440.848

Vendor	0.01314	0.00578	0.32293	0.09987	0.00225	0.00450	0.08556	0.09006	0.00450	0.02364	0.02814	—	295.739	295.739	0.00670	0.04427	0.01955	309.118
Hauling	0.11089	0.04016	3.00013	0.72035	0.01834	0.05239	0.71682	0.76921	0.05239	0.20103	0.25342	—	2,631.00	2,631.00	0.05064	0.41213	0.13160	2,755.21
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10279	0.09090	0.10385	1.26339	0.00000	0.00000	0.30884	0.30884	0.00000	0.07232	0.07232	—	302.209	302.209	0.00423	0.01136	0.43483	306.135
Vendor	0.00915	0.00411	0.22076	0.06750	0.00154	0.00308	0.05789	0.06097	0.00308	0.01601	0.01909	—	202.472	202.472	0.00474	0.03032	0.22245	211.848
Hauling	0.07715	0.02930	2.06625	0.48801	0.01256	0.03588	0.48546	0.52134	0.03588	0.13632	0.17220	—	1,801.47	1,801.47	0.03469	0.28168	1.50003	1,887.78
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01876	0.01659	0.01895	0.23057	0.00000	0.00000	0.05636	0.05636	0.00000	0.01320	0.01320	—	50.0341	50.0341	0.00070	0.00188	0.07199	50.6842
Vendor	0.00167	0.00075	0.04029	0.01232	0.00028	0.00056	0.01057	0.01113	0.00056	0.00292	0.00348	—	33.5215	33.5215	0.00079	0.00502	0.03683	35.0739
Hauling	0.01408	0.00535	0.37709	0.08906	0.00229	0.00655	0.08860	0.09514	0.00655	0.02488	0.03143	—	298.254	298.254	0.00574	0.04664	0.24835	312.543

3.3. Grading (2028)

3.3.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.80089	4.87301	41.6555	45.3754	0.10012	1.70047	—	1.70047	1.56443	—	1.56443	—	10,797.4	10,797.4	0.43799	0.08760	—	10,834.5
Dust From Material Movement	—	—	—	—	—	—	16.8331	16.8331	—	7.13828	7.13828	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	5.80089	4.87301	41.6555	45.3754	0.10012	1.70047	—	1.70047	1.56443	—	1.56443	—	10,797.4	10,797.4	0.43799	0.08760	—	10,834.5
Dust From Material Movement	—	—	—	—	—	—	16.8331	16.8331	—	7.13828	7.13828	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.06607	1.73559	14.8362	16.1611	0.03566	0.60565	—	0.60565	0.55719	—	0.55719	—	3,845.66	3,845.66	0.15600	0.03120	—	3,858.86
Dust From Material Movement	—	—	—	—	—	—	5.99536	5.99536	—	2.54240	2.54240	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37706	0.31675	2.70760	2.94940	0.00651	0.11053	—	0.11053	0.10169	—	0.10169	—	636.693	636.693	0.02583	0.00517	—	638.878
Dust From Material Movement	—	—	—	—	—	—	1.09415	1.09415	—	0.46399	0.46399	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.3.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15239	0.13580	0.12076	2.16670	0.00000	0.00000	0.45748	0.45748	0.00000	0.10723	0.10723	—	464.906	464.906	0.00540	0.01659	1.31869	471.303
Vendor	0.01336	0.00622	0.29405	0.09475	0.00225	0.00450	0.08556	0.09006	0.00450	0.02364	0.02814	—	288.823	288.823	0.00467	0.04427	0.68494	302.817
Hauling	0.11438	0.04366	2.78883	0.69241	0.01834	0.05239	0.71682	0.76921	0.05239	0.20103	0.25342	—	2,570.83	2,570.83	0.05064	0.41125	4.66976	2,699.32
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13118	0.12809	0.13658	1.63892	0.00000	0.00000	0.45748	0.45748	0.00000	0.10723	0.10723	—	427.643	427.643	0.00617	0.01659	0.03429	432.776
Vendor	0.01292	0.00578	0.30790	0.09718	0.00225	0.00450	0.08556	0.09006	0.00450	0.02364	0.02814	—	289.052	289.052	0.00467	0.04427	0.01772	302.379
Hauling	0.11089	0.04016	2.90845	0.70463	0.01834	0.05239	0.71682	0.76921	0.05239	0.20103	0.25342	—	2,572.30	2,572.30	0.05064	0.41125	0.12136	2,696.24
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04645	0.04535	0.04864	0.61478	0.00000	0.00000	0.16060	0.16060	0.00000	0.03761	0.03761	—	154.235	154.235	0.00220	0.00591	0.20285	156.253
Vendor	0.00468	0.00214	0.11024	0.03422	0.00080	0.00160	0.03010	0.03171	0.00160	0.00833	0.00993	—	102.903	102.903	0.00166	0.01577	0.10514	107.748
Hauling	0.04012	0.01524	1.04148	0.24848	0.00653	0.01866	0.25244	0.27110	0.01866	0.07088	0.08954	—	915.857	915.857	0.01804	0.14647	0.71865	960.676
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00848	0.00828	0.00888	0.11220	0.00000	0.00000	0.02931	0.02931	0.00000	0.00686	0.00686	—	25.5353	25.5353	0.00036	0.00098	0.03358	25.8695
Vendor	0.00085	0.00039	0.02012	0.00625	0.00015	0.00029	0.00549	0.00579	0.00029	0.00152	0.00181	—	17.0368	17.0368	0.00028	0.00261	0.01741	17.8390
Hauling	0.00732	0.00278	0.19007	0.04535	0.00119	0.00341	0.04607	0.04948	0.00341	0.01294	0.01634	—	151.631	151.631	0.00299	0.02425	0.11898	159.051

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	1/4/2027	1/15/2027	5.00000	10.00000	—
Grading	Grading	1/16/2027	6/30/2028	5.00000	380.000	Pond Deepening, Soil Export, Berm Raising

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	2.00000	8.00000	367.000	0.40000
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	2.00000	8.00000	84.0000	0.37000
Grading	Excavators	Diesel	Average	2.00000	8.00000	36.0000	0.38000
Grading	Scrapers	Diesel	Average	3.00000	8.00000	423.000	0.48000
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00000	8.00000	84.0000	0.37000
Grading	Rubber Tired Dozers	Diesel	Average	2.00000	8.00000	367.000	0.40000
Grading	Rollers	Diesel	Average	1.000000	8.00000	36.0000	0.38000
Grading	Bore/Drill Rigs	Diesel	Average	1.000000	8.00000	83.0000	0.50000
Grading	Pumps	Diesel	Average	1.000000	8.00000	11.0000	0.74000
Grading	Graders	Diesel	Average	1.000000	8.00000	148.000	0.41000
Grading	Other Construction Equipment	Diesel	Average	1.000000	8.00000	82.0000	0.42000

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	Worker	10.00000	18.5000	LDA,LDT1,LDT2
Site Preparation	Vendor	10.00000	10.2000	HHDT,MHDT
Site Preparation	Hauling	0.00000	20.0000	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	Worker	35.0000	18.5000	LDA,LDT1,LDT2
Grading	Vendor	10.00000	10.2000	HHDT,MHDT
Grading	Hauling	39.6053	20.0000	HHDT
Grading	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	10.00000	0.00000	0.00000
Grading	—	120,400	1,620.00	0.00000	0.00000

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2027	0.00000	531.983	0.03300	0.00400
2028	0.00000	531.983	0.03300	0.00400

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	23.2500	annual days of extreme heat
Extreme Precipitation	3.30000	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	8.49000	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	95.2707
AQ-PM	39.1413
AQ-DPM	28.6248
Drinking Water	5.94480
Lead Risk Housing	31.7454

Pesticides	78.8966
Toxic Releases	19.6799
Traffic	17.3125
Effect Indicators	—
CleanUp Sites	58.9586
Groundwater	2.72290
Haz Waste Facilities/Generators	50.1390
Impaired Water Bodies	0.00000
Solid Waste	0.00000
Sensitive Population	—
Asthma	83.1381
Cardio-vascular	98.3425
Low Birth Weights	26.8668
Socioeconomic Factor Indicators	—
Education	70.3999
Housing	43.8910
Linguistic	35.3363
Poverty	69.8241
Unemployment	94.5211

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	32.86282561
Employed	8.700115488
Median HI	38.82971898
Education	—

Bachelor's or higher	11.36917747
High school enrollment	18.20864879
Preschool enrollment	34.72346978
Transportation	—
Auto Access	64.27563198
Active commuting	17.55421532
Social	—
2-parent households	48.1714359
Voting	33.85089183
Neighborhood	—
Alcohol availability	86.93699474
Park access	21.80161684
Retail density	10.57359168
Supermarket access	33.06813807
Tree canopy	2.515077634
Housing	—
Homeownership	75.87578596
Housing habitability	87.02681894
Low-inc homeowner severe housing cost burden	78.49351983
Low-inc renter severe housing cost burden	77.50545361
Uncrowded housing	55.19055563
Health Outcomes	—
Insured adults	32.84999358
Arthritis	0.0
Asthma ER Admissions	17.6
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0

Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	35.5
Cognitively Disabled	32.0
Physically Disabled	5.0
Heart Attack ER Admissions	1.8
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	14.1
Elderly	45.2
English Speaking	51.5
Foreign-born	27.3
Outdoor Workers	15.6
Climate Change Adaptive Capacity	—
Impervious Surface Cover	81.2
Traffic Density	13.6

Traffic Access	23.0
Other Indices	—
Hardship	65.8
Other Decision Support	—
2016 Voting	39.1

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	56.0000
Healthy Places Index Score for Project Location (b)	25.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

8.1. Justifications

Screen	Justification
Construction: Construction Phases	18-month construction duration. See Project Description for phasing.

Construction: Off-Road Equipment	See Project Description
Construction: Dust From Material Movement	120,400 CY of soil export

8.4. Construction

8.4.1. Construction Phases

Phase Type	Phase Name	Model Parameter	Default Value	New Value
Site Preparation	Site Preparation	Start Date	3/16/2027	1/4/2027
Site Preparation	Site Preparation	End Date	4/27/2027	1/15/2027
Site Preparation	Site Preparation	Work Days per Phase	30.0000	10.00000
Grading	Grading	Start Date	4/28/2027	1/16/2027
Grading	Grading	End Date	8/11/2027	6/30/2028
Grading	Grading	Work Days per Phase	75.0000	380.000
Grading	Grading	Description	—	Pond Deepening, Soil Export, Berm Raising

8.4.2. Off-Road Equipment

Phase Name	Equipment Type	Model Parameter	Default Value	New Value
Site Preparation	Rubber Tired Dozers	Number per Day	3.00000	2.00000
Site Preparation	Tractors/Loaders/Backhoes	Number per Day	4.00000	2.00000
Grading	Scrapers	Number per Day	2.00000	3.00000

8.4.4. Dust from Material Movement

Phase Name	Model Parameter	Units	Default Value	New Value
Grading	Material Exported	Cubic Yards	—	120,400
Grading	Total Acres Graded	acres	1,710.00	1,620.00

Appendix C

Biological Resources Assessment

Biological Resources Assessment

Alessandro Ponds Optimization Phase II Project
Riverside County, CA



August 2026

acorn environmental

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Section 1 | Introduction

1.1 PURPOSE OF ASSESSMENT

This Biological Resources Assessment (BRA) Report has been prepared on behalf of the Eastern Municipal Water District (EMWD) for the Alessandro Ponds Optimization Phase II Project (Proposed Project). This assessment provides information about the biological resources within the Study Area, the regulatory environment affecting such resources, any potential Project-related impacts upon these resources, and identifies mitigation measures and other recommendations to reduce the significance of these impacts.

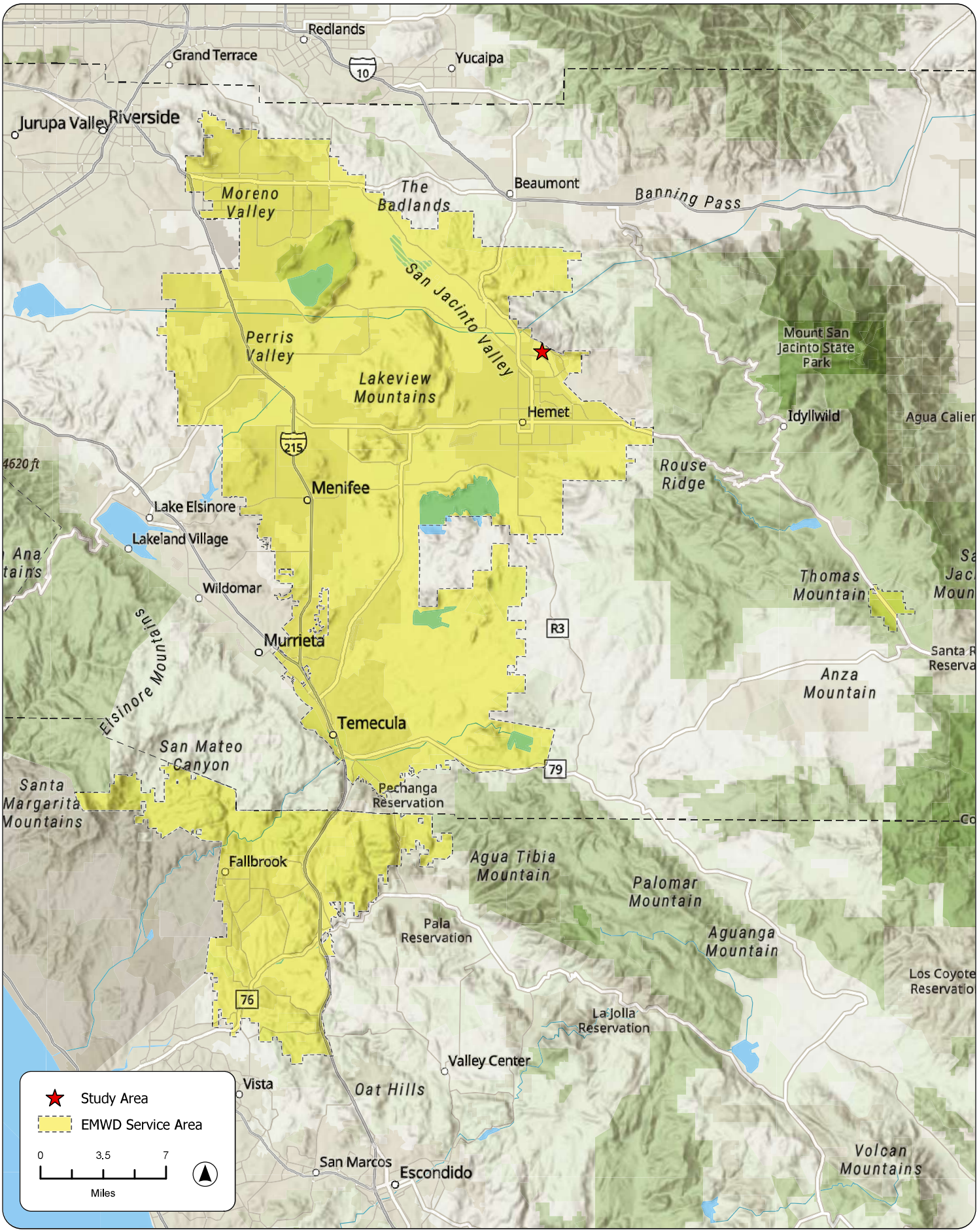
1.2 DESCRIPTION OF PROPOSED PROJECT AND STUDY AREA

EMWD operates the Alessandro Ponds recycled water storage facility near the intersection of West Ramona Expressway and Alessandro Avenue North in the City of San Jacinto and unincorporated Riverside County (**Figure 1** and **Figure 2**). EMWD uses the ponds to store recycled water that is produced by the San Jacinto Valley Regional Water Reclamation Facility and other EMWD reclamation facilities. The Proposed Project would increase the total water storage capacity of the four existing ponds from 172 acre-feet to 369 acre-feet through deepening, expansion, and raising of the berms surrounding the ponds. The berms, which are currently subject to erosion, would also be stabilized with the addition of a soil-cement surface.

The Study Area includes 37.8 acres partially in the City of San Jacinto, California and partially in unincorporated Riverside County (**Figure 2**), within the EMWD service area. The Study Area is located within the U.S. Geological Survey San Jacinto quadrangle, Township 4 South, Range 1 West, and includes Assessor Parcel Numbers (APNs) 433070018, 433070019, 433070020, 433070021, 433070031, and construction access areas. The Study Area is bounded by Alta Nursery (wholesale plant nursery) and undeveloped land to the west, the San Jacinto River levee on the northeast, undeveloped land to the east, and by West Ramona Expressway to the south.

Figure 3 depicts an aerial photograph of the existing ponds. The bottom of Pond 1 would be excavated approximately 1 foot deeper through the removal of soil, while the bottoms of Ponds 2 and 3 would be excavated approximately 6 to 9 feet deeper. The height of the berms lining each pond would also be raised approximately 3 to 5 feet using soil excavated from the pond bottoms. The berms would also be stabilized with the addition of soil cement laid on the slopes. Pond 3 would be expanded approximately 100 feet northeast towards Ponds 1 and 2. To do this, a soil stockpile currently located in this area would be removed. Existing underground pipelines and supporting infrastructure would be relocated and replaced as necessary. Two existing monitoring wells on site would be abandoned and relocated by drilling new wells to a depth of 200 feet. Raising and regrading the berm along the northeasterly edge of Ponds 1, and 2 would require the temporary removal of the existing fence along the property line, which would be reinstalled at the completion of construction.

The entire 37.8-acre Study Area, including the EMWD-owned parcels with all ponds and the two potential construction access areas, depicted in **Figure 3**, would be subject to ground disturbance activities during construction of the Proposed Project.



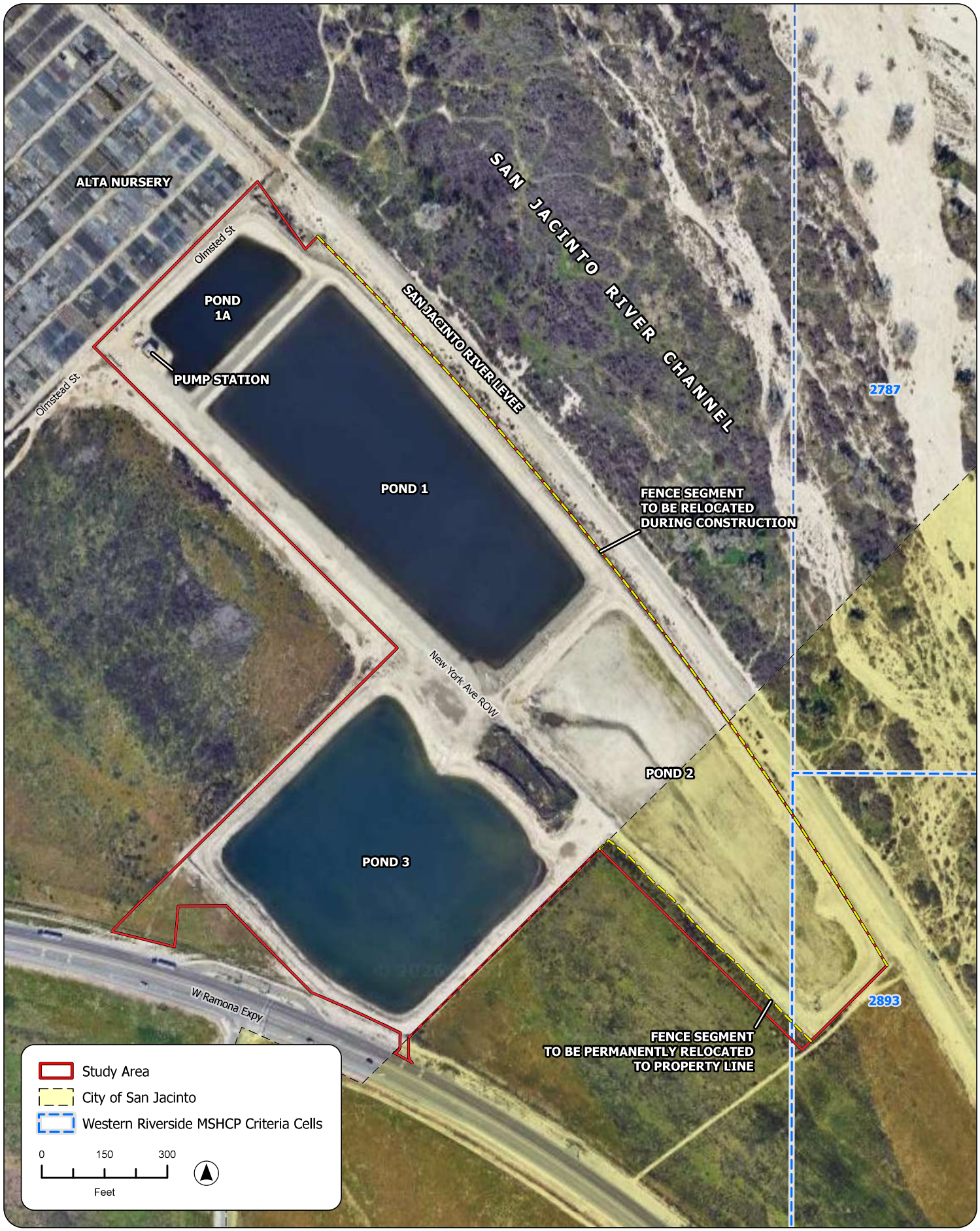
SOURCE: ESRI, 2026; Riverside County, 2026; Acorn Environmental, 5/15/2026

Figure 1
Regional Location



SOURCE: "San Jacinto, CA" USGS 7.5 Minute Topographic Quadrangle, T4S R1W, Sections 23, 24, 25, & 26, San Bernardino Baseline & Meridian; ESRI, 2026; Riverside County, 2026; Acorn Environmental, 7/1/2026

Figure 2
Site and Vicinity



SOURCE: ESRI, 2026; Vivid Aerial Photograph, 10/7/2025; Riverside County, 2026; Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), 2026; Acorn Environmental, 7/1/2026

Figure 3
Aerial Overview

After completion of construction, operation activities would be consistent with the ongoing maintenance activities currently being completed for the existing ponds. These activities within the Study Area include annual mowing and disking of pond bottoms and berms, vermin abatement, pesticide application, tumbleweed removal, fence repair, and trash removal as needed.

1.3 REGULATORY SETTING

The following section summarizes some applicable regulations of biological resources on real property in California.

1.3.1 Special-status Species Regulations

Federal Endangered Species Act

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service implement the Federal Endangered Species Act of 1973 (FESA) (16 USC §1531 et seq.). Threatened and endangered species on the federal list (50 CFR §17.11, 17.12) are protected from "take" (direct or indirect harm), unless a FESA Section 10 Permit is granted or a FESA Section 7 Biological Opinion with incidental take provisions is rendered. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the Study Area and determine whether the proposed project will have a potentially significant impact upon such species. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC §1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant and would require mitigation. Species that are candidates for listing are not protected under FESA; however, USFWS advises that a candidate species could be elevated to listed status at any time, and therefore, applicants should regard these species with special consideration.

Magnuson-Stevens Act and Sustainable Fisheries Act

The Magnuson–Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary law that governs marine fisheries management in U.S. federal waters. First passed in 1976, the Magnuson-Stevens Act fosters the long-term biological and economic sustainability of marine fisheries. The Sustainable Fisheries Act of 1996 (Public Law 104-297) amended the Magnuson-Stevens Act to establish new requirements for fishery management councils to identify and describe Essential Fish Habitat (EFH) and to protect, conserve, and enhance EFH for the benefit of fisheries. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The Sustainable Fisheries Act also established a federal EFH consultation process that advises federal agencies to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. An adverse effect includes direct or indirect physical, chemical, or biological alternations to waters or substrate, species and their habitat, quality and/or quantity of EFH, or other ecosystem components. If a federal agency determines that an action will not adversely affect EFH, and NOAA Fisheries agrees, no consultation is required. A 2002 update to EFH regulations allowed fishery management councils to designate Habitat Areas of Particular Concern, specific areas within EFH that have extremely important ecological functions and/or are especially vulnerable to degradation.

California Endangered Species Act

The California Endangered Species Act of 1970 (CESA) (California Fish and Game Code §2050 et seq., and CCR Title 14, §670.2, 670.51) prohibits "take" (defined as hunt, pursue, catch, capture, or kill) of species listed under CESA. A CESA permit must be obtained if a project will result in take of listed species, either during construction or over the life of the project. Section 2081 establishes an incidental take permit program for state-listed species. Under CESA, California Department of Fish and Wildlife (CDFW) has the responsibility for maintaining a list of threatened and endangered species designated under state law (CFG Code 2070). CDFW also maintains lists of species of special concern, which serve as "watch lists." Pursuant to requirements of CESA, an agency reviewing proposed projects within its jurisdiction must determine whether any state-listed species may be present in the Study Area and determine whether the proposed project will have a potentially significant impact upon such species. Project-related impacts to species on the CESA list would be considered significant and would require mitigation.

California Fish and Game Code

The California Fish and Game Code defines "take" (Section 86) and prohibits take of a species listed under the CESA (California Fish and Game Code § 2080), or has otherwise been designated as having special status (California Fish and Game Code §§ 3511, 4700, and 5050). Section 2081(b) and (c) of the CESA allows CDFW to issue an incidental take permit for a State-listed species if specific criteria outlined in Title 14 CCR §§ 783.4(a), (b) and CDFW Code § 2081(b) are met. The CDFW Code § 3503 also states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by the code.

Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the taxonomic order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the U.S. Secretary of the Interior under provisions of the MBTA. CDFW cannot provide take authorization under the CESA for impacts to migratory birds.

Native Plant Protection Act of 1977

The Native Plant Protection Act of 1977 and implementing regulations in Section 1900 et seq. of the California Fish and Game Code designate special-status plant species and provide specific protection measures for identified populations. The CDFW administers the Native Plant Protection Act.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Many bird species, especially those that are breeding, migratory, or of limited distribution, are protected under federal and state regulations. Under the Migratory Bird Treaty Act of 1918 (16 USC §703-711), migratory bird species and their nests and eggs that are on the federal list (50 CFR §10.13) are protected from injury or death, and project-related disturbances must be reduced or eliminated during the nesting cycle. California Fish and Game Code (§3503, 3503.5, and 3800) prohibits the possession, incidental take, or needless destruction of any bird nests or eggs. Fish and Game Code §3511 designates certain bird species "fully protected", making it unlawful to take, possess, or destroy these species except under issuance of a specific permit. The Bald and Golden Eagle Protection Act (16 USC §668) specifically protects bald and golden eagles from harm or trade in parts of these species.

California Environmental Quality Act

California Environmental Quality Act (CEQA) (Public Resources Code §15380) defines "rare" in a broader sense than the definitions of threatened, endangered, or fully protected. Under the CEQA definition, CDFW can request additional consideration of species not otherwise protected. CEQA requires that the impacts of a project upon environmental resources must be analyzed and assessed using criteria determined by the lead agency. Sensitive species that would qualify for listing but are not currently listed may be afforded protection under CEQA. The CEQA Guidelines (§15065) require that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines (§15380) provide for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Plant species on the California Native Plant Society (CNPS) Lists 1A, 1B, or 2 are typically considered rare under CEQA. California "Species of Special Concern" is a category conferred by CDFW on those species that are indicators of regional habitat changes or are considered potential future protected species. While they do not have statutory protection, Species of Special Concern are typically considered rare under CEQA and thereby warrant specific protection measures.

1.3.2 Water Resource Protection

Clean Water Act

Real property that contains water resources are subject to various federal and state regulations and activities occurring in these water resources may require permits, licenses, variances, or similar authorization from federal, state and local agencies, as described next.

The Federal Water Pollution Control Act Amendments of 1972 (as amended), commonly known as the Clean Water Act (CWA), established the basic structure for regulating discharges of pollutants into "waters of the United States". Waters of the US includes essentially all surface waters, all interstate waters and their tributaries, all impoundments of these waters, and all wetlands adjacent to these waters. CWA Section 404 requires approval prior to dredging or discharging fill material into any waters of the US, especially wetlands. The permitting program is designed to minimize impacts to waters of the US, and when impacts cannot be avoided, requires compensatory mitigation. The US Army Corps of Engineers (USACE) is responsible for administering Section 404 regulations. Substantial impacts to jurisdictional wetlands may require an Individual Permit. Small-scale projects may require only a Nationwide Permit, which typically has an expedited process compared to the Individual Permit process. Mitigation of wetland impacts is required as a condition of the CWA Section 404 Permit and may include on-site preservation, restoration, or enhancement and/or off-site restoration or enhancement. The characteristics of the restored or enhanced wetlands must be equal to or better than those of the affected wetlands to achieve no net loss of wetlands.

Under CWA Section 401, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with State water quality standards. The California State Water Resources Control Board is responsible for administering CWA Section 401 regulations.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 requires approval from USACE prior to the commencement of any work in or over navigable Waters of the US, or which affects the course, location,

condition or capacity of such waters. Navigable waters of the United States are defined as waters that have been used in the past, are now used, or are susceptible to use, as a means to transport interstate or foreign commerce up to the head of navigation. Rivers and Harbors Act Section 10 permits are required for construction activities in these waters.

California Fish and Game Code

California Fish and Game Code (§1601 - 1607) protects fishery resources by regulating "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." CDFW requires notification prior to commencement, and issuance of a Lake or Streambed Alteration Agreement, if a proposed project will result in the alteration or degradation of ''waters of the State". The limit of CDFW jurisdiction is subject to the judgment of the Department; currently, this jurisdiction is interpreted to be the "stream zone", defined as "that portion of the stream channel that restricts lateral movement of water" and delineated at "the top of the bank or the outer edge of any riparian vegetation, whichever is more landward". CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and the applicant is the Streambed Alteration Agreement. Projects that require a Streambed Alteration Agreement may also require a CWA 404 Section Permit and/or CWA Section 401 Water Quality Certification.

National Pollutant Discharge Elimination System

For construction projects that disturb one or more acres of soil, the landowner or developer must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2022-0057-DWQ). Compliance with the Construction General Permit includes preparation of a site-specific Stormwater Pollution Prevention Plan (SWPPP) that determines appropriate best management practices (BMPs) the contractor must undertake to control water quality of stormwater discharges offsite during construction.

1.3.3 Regional Regulations

Riverside County General Plan

Chapter 5 of the County of Riverside General Plan contains the County's Multipurpose Open Space Element and contains the County's goals and policies related to biological resources. This includes water resources, forestry resources, vegetation communities, open spaces, and conservation plans. According to the General Plan, the purpose of the Multipurpose Open Space Element is to "addresses protecting and preserving natural resources, agriculture and open space areas, managing mineral resources, preserving and enhancing cultural resources, and providing recreational opportunities for the citizens of Riverside County."

Riverside County Municipal Code

The Riverside County Municipal Code Chapter 12.24.050 requires a permit for the removal of native trees. According to County Code, the planning director may approve tree removal permits if tree removal would not result in increased erosion/ flow of surface water and if one or more of the following are met: (1) the tree presents a public health hazard; (2) the tree density is so great that thinning is necessary to the overall health of the treed area; (3) 50 percent of trees on a property are maintained, with at least half of these

in the front yard/visible from the public road; or (4) tree removal is part of construction of residences within an area zoned for residences. Chapter 13.12 provides requirements related to stormwater and other discharges protective of water resources.

Western Riverside County Multi-Species Habitat Conservation Plan

The Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP) covers the western portion of Riverside County. EMWD is not a signatory to the MSHCP but can participate in the MSHCP as a Special Entity if take of covered species is necessary for implementation of a project within the MSHCP plan area.

According to the MSHCP, the plan has the following three overarching goals:

- Biological Goal: In the MSHCP Plan Area, Conserve Covered Species and their Habitats.
- Economic Goal: Improve the future economic development in the County by providing an efficient, streamlined regulatory process through which Development can proceed in an efficient way. The MSHCP and the General Plan will provide the County with a clearly articulated blueprint describing where future Development should and should not occur.
- Social Goal: Provide for permanent open space, community edges, and recreational opportunities, which contribute to maintaining the community character of Western Riverside County.

The MSHCP provides a streamlined review of proposed development projects and a review of potential impacts and necessary avoidance and minimization measures for federally listed species.

The MSHCP, in addition to being a Habitat Conservation Plan, is also considered a Natural Communities Conservation Plan (NCCP). An NCCP Permit issued through the MSHCP by CDFW provides a streamlined review of proposed development projects and a review of potential impacts and necessary avoidance and minimization measures for State-listed species.

City of San Jacinto General Plan

Chapter 6 of the City of San Jacinto's 2040 General Plan contains the City's Resource Management Element and the City's goals related to biological resources. According to the City's General Plan, the goal of biological resource protection is to "preserve and enhance biological communities that contribute to the region's biodiversity, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements." Additionally, the City's General Plan aims to address its conservation and resource protection goal through "[cooperating] with the County of Riverside to develop and manage preserve areas within the urban landscape. During the review of development proposals, use the Western Riverside County MSHCP (particularly Section 3.2.13 San Jacinto Valley Area Plan) to help assess potential project impacts and mitigation requirements."

Section 2 | Environmental Setting

The Study Area is located within the Western Transverse Ranges geographic subregion, which is contained within the Southwestern California geographic subdivision of the larger California Floristic Province (Baldwin et al. 2012). The Study Area is at the boundary of two ecological subsections: San Jacinto Foothills – Cahuilla Mountains; and San Jacinto Mountains (County of Riverside, 2003). The Study Area and vicinity is in climate Zone 19: Thermal belts around Southern California's interior valleys (Sunset, 2026). This region has a Mediterranean-type climate, characterized by distinct seasons of hot, dry summers and wet, moderately-cold winters.

The topography of the Study Area is flat and is part of a river floodplain. A major levee of the San Jacinto River is adjacent to the Study Area. Elevations within the Study Area range from approximately 1,540 feet to 1,560 feet above mean sea level.

The Study Area includes the EMWD-owned parcels that contain a recycled water storage facility that is currently fenced in and the two potential construction access easements. It is bounded by Alta Nursery (wholesale plant nursery) and undeveloped land to the west, the San Jacinto River levee on the northeast, undeveloped land to the east, and by West Ramona Expressway to the south. Row crop agriculture and grazing lands are located northwest of the Study Area. Regionally, the City of San Jacinto is located to the south of the Study Area. The San Jacinto River is located along the northeastern boundary of the Study Area, and Mount San Jacinto and the Mount San Jacinto State Park are located due east on the opposite side of the river.

Section 3 | Methods

3.1 PRELIMINARY DATA GATHERING AND RESEARCH

Prior to conducting the field survey, the following information sources were reviewed:

- Previous biological resource studies pertaining to the Study Area or vicinity
- United States Geologic Service (USGS) 7.5 degree-minute topographic quadrangles of the Study Area and vicinity
- Aerial photography of the Study Area
- California Natural Diversity Database (CNDDB), electronically updated monthly by subscription (**Attachment 1**)
- A query of the California Native Plant Society's (CNPS) database *Inventory of Rare and Endangered Plants of California* (online edition) (**Attachment 1**)
- USFWS National Wetlands Inventory (NWI) mapper
- USFWS species list (IPaC Trust Resources Report) (**Attachment 1**)

3.2 FIELD SURVEYS

Consulting biologist Dr. Geo Graening conducted a biological field assessment on April 14, 2026, and collected data on wildlife and plant species present, as well as habitat types and jurisdictional waters. Variable-intensity pedestrian surveys were performed. Fauna and flora observed were recorded in a field notebook and identified to the lowest possible taxon. Survey efforts emphasized the search for State- and federally-listed species that had documented occurrences in the CNDDB within the vicinity of the Study Area. Habitat types occurring in the Study Area were mapped on aerial photographs and information on habitat conditions and the suitability of habitats to support listed species was also recorded. The Study Area was also assessed for the presence of potentially-jurisdictional water features, including riparian zones, isolated wetlands and vernal pools, and other biologically-sensitive aquatic habitats.

3.3 MAPPING AND OTHER ANALYSES

Locations of species' occurrences and habitat boundaries within the Study Area were recorded on color aerial photographs and then digitized to produce the habitat maps. The boundaries of potentially jurisdictional water resources within the Study Area were identified and measured in the field and similarly digitized to calculate acreage and to produce informal delineation maps. Geographic analyses were performed using geographical information system software (ArcGIS 10, ESRI, Inc.). Vegetation communities (assemblages of plant species growing in an area of similar biological and environmental factors), were classified by Vegetation Series (distinctive associations of plants, described by dominant species and particular environmental setting) using the CNPS Vegetation Classification system (Sawyer and Keeler-Wolf, 1995). Wetlands and other aquatic habitats were classified using USFWS National Wetlands Inventory Classification System for Wetland and Deepwater Habitats, or "Cowardin class" (Cowardin et al., 1979; USFWS 2007).

Informal wetland delineation methods consisted of an abbreviated, visual assessment of the three requisite wetland parameters (hydrophytic vegetation, hydric soils, hydrologic regime) defined in the U.S. Army Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). Wildlife

habitats were classified according to the CDFW's California Wildlife Habitat Relationships System (CDFW, 2023a). Species' habitat requirements and life histories were identified using the following sources: Baldwin et al. (2012); CNPS (2023), Calflora (2023); CDFW (2023b); and University of California at Berkeley (2023a,b).

Section 4 | Results

4.1 WILDLIFE

The following animals were detected within the Study Area during the field survey:

- ants (*Formicidae*);
- white skipper (*Heliopetes sp*.);
- darkling beetle (*Tenebrionidae*);
- grasshopper (*Orthoptera*);
- coyote (*Canis latrans*);
- northern rubber boa (*Charina bottae*);
- fence lizard (*Sceloporus occidentalis*);
- western side-blotched lizard (*Uta stansburiana elegans*);
- killdeer (*Charadrius vociferus*);
- Canada goose (*Branta canadensis*);
- black-necked stilt (*Himatopus mexicanus*);
- California towhee (*Melozone crissalis*);
- song sparrow (*Melospiza melodia*);
- black-chinned hummingbird (*Archilochus alexandri*);
- Bewick's wren (*Thryomanes bewickii*);
- California quail (*Callipepla californica*);
- common raven (*Corvus corax*); and
- roadrunner (*Geococcyx sp*.).

No State- or federally-listed species were detected. No special-status species were detected.

4.2 VEGETATION COMMUNITIES

Vegetation communities occurring in the Study Area were mapped (see **Figure 4**) and photographs of the site are presented in **Attachment 2**. The Study Area consists entirely of ruderal / developed habitat. There are no natural vegetation communities in the Study Area. Facility maintenance requires the control or absence of vegetation, so the Study Area is regularly disced, ripped, scraped, trimmed, or has herbicides applied. Areas not actively managed for weed control have non-native annual grasses and weedy forbs, such as spanish brome (*Bromus madritensis*), mustards (*Sisymbrium sp*., *Hirschfeldia incana*), tumbleweed (*Salsola tragus*), pineapple weed (*Matricaria discoidea*), pigweed (*Amaranthus*), stinknet (*Oncosiphon pilulifer*), and finger-grass (*Paspalum*).

Remnants of montane scrub habitat exist within the disturbed landscape, indicated by the presence of native xeric species such as bird's foot trefoil (*Acmispon*), California buckwheat (*Eriogonum fasciculatum*), bristly fiddleneck (*Amsinckia tessellata*), and wooly sunflower (*Eriophyllum*).

There is some floating or emergent vegetation in the ponds, such as widgeongrass (*Ruppia maritima*), duckweed (*Lemna*), and water starwort (*Callitriche*). In pond bottoms that were visible at the time of the survey, there is western marsh cudweed (*Gnaphalium palustre*), dodder (*Cuscuta*), willow (*Salix cf. gooddingii*) saltbush (*Atriplex*), dock (*Rumex*), and cocklebur (*Xanthium strumarium*).

4.3 CRITICAL HABITAT AND SPECIAL-STATUS HABITAT

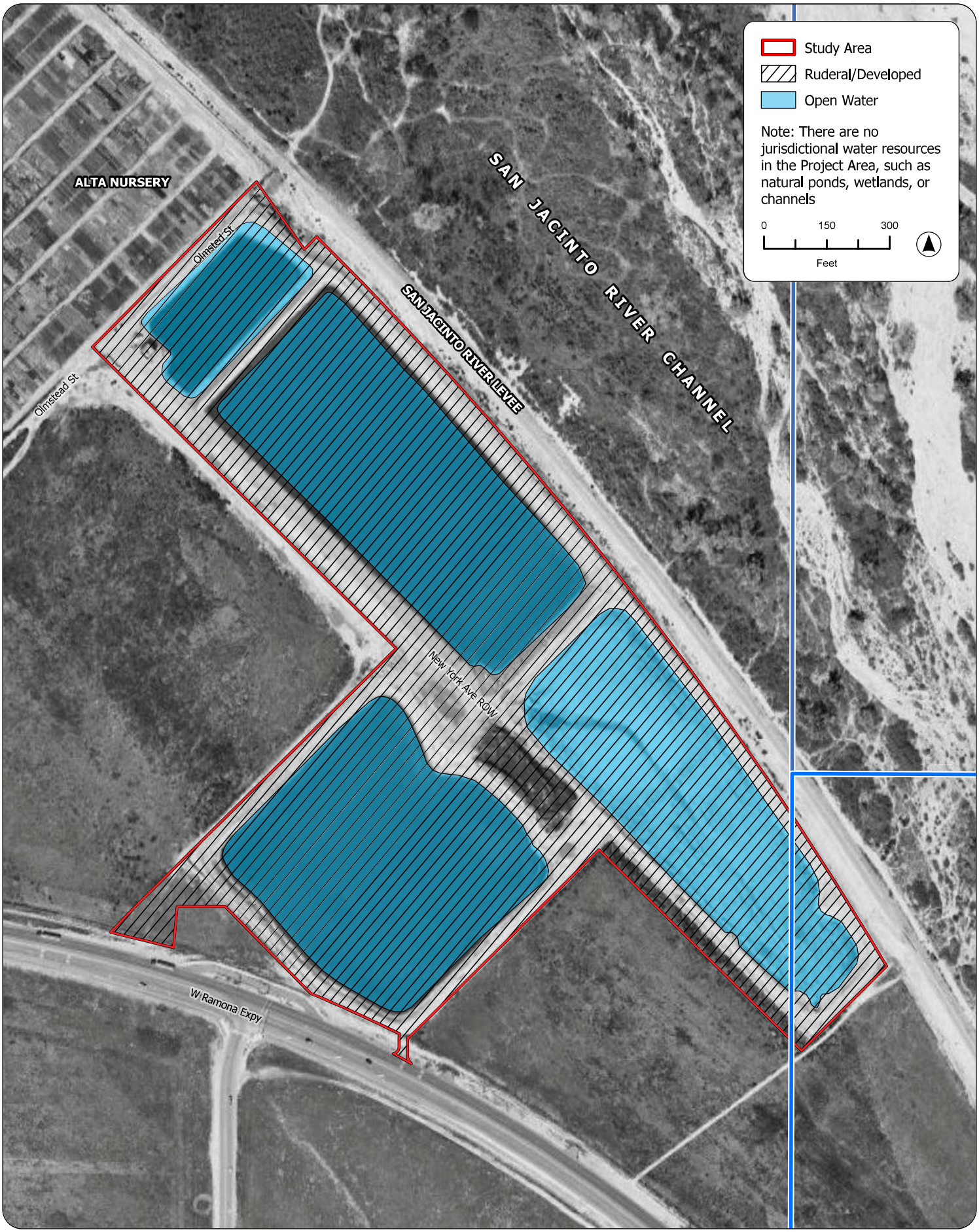
No critical habitat for any federally-listed species occurs within the Study Area (**Attachment 1**). However, there is critical habitat for San Bernardino Merriam's kangaroo rat (*Dipodomys merriami parvus*) adjacent to the Study Area on the other side of the flood levee in the San Jacinto River.

The CNDDB reported one special-status habitat within the Study Area: Southern Cottonwood Willow Riparian Forest (see **Figure 5**). However, this is an artifact of the mapping process. The actual CNDDB notes state that this habitat is in the "*San Jacinto River Bed*", which is located on the other side of the flood levee outside of the Study Area. The CNDDB also reported the following sensitive habitats in a 10-mile radius outside of the Study Area: Desert Fan Palm Oasis Woodland; Southern Coast Live Oak Riparian Forest; Southern Cottonwood Willow Riparian Forest; and Southern Mixed Riparian Forest. None of these conspicuous habitat types occur within the Study Area, although riparian forest does occur adjacent to the Study Area on the other side of the flood control levee in the floodplain of the San Jacinto River. No special-status habitats were detected within the Study Area during the field survey.

4.4 HABITAT PLANS AND WILDLIFE CORRIDORS

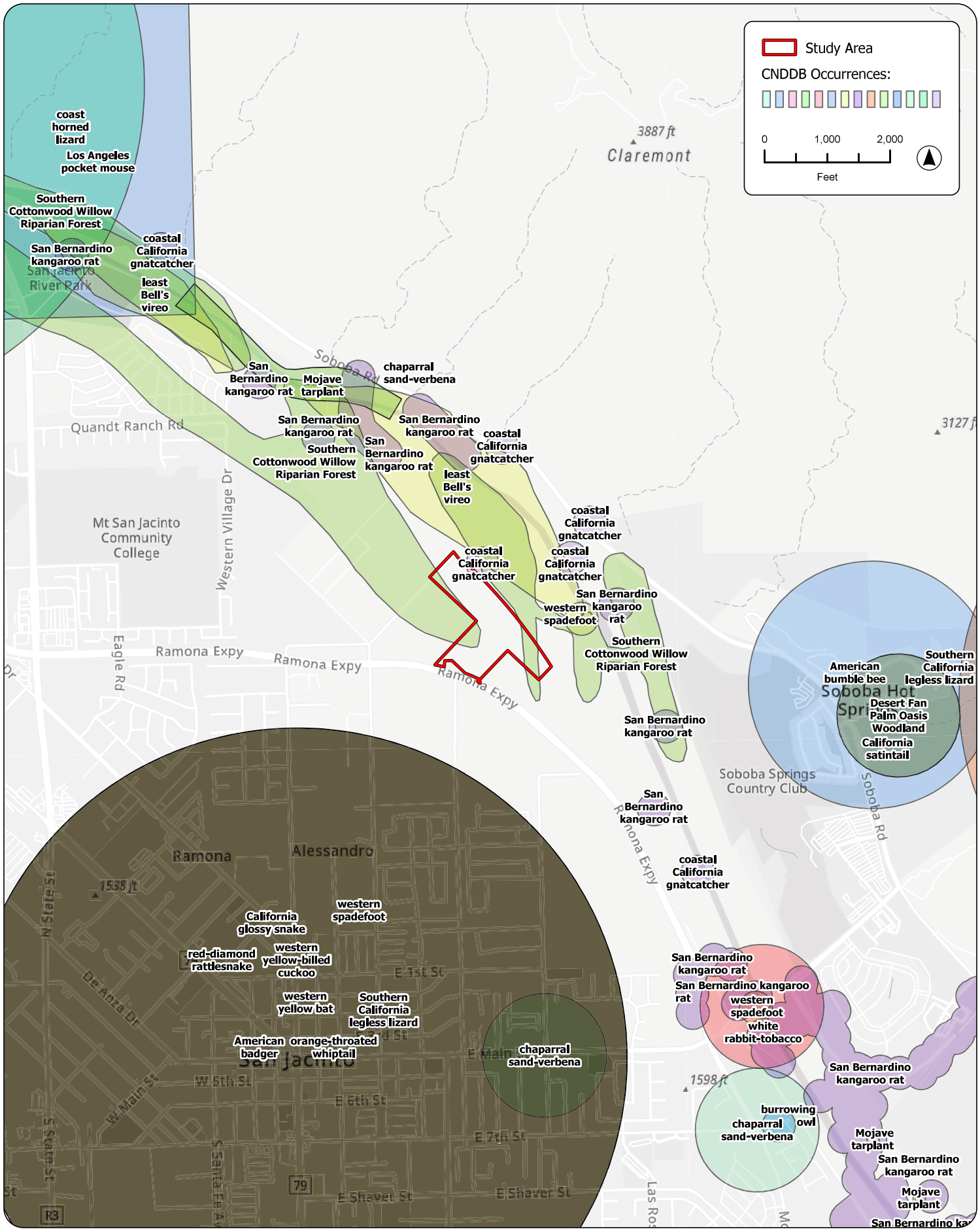
Wildlife movement corridors link remaining areas of functional wildlife habitat that are separated primarily by human disturbance, but natural barriers such as rugged terrain and abrupt changes in vegetation cover are also possible. Wilderness and open lands have been fragmented by urbanization, which can disrupt migratory species and separate interbreeding populations. Corridors allow migratory movements and act as links between these separated populations.

The Study Area is surrounded by fencing, and facility maintenance activities discourage animal occupation, and therefore the Study Area itself is not a part of a wildlife corridor. On the other side of the levee adjacent to the Study Area, the San Jacinto River and its floodplain serve as a wildlife corridor. The San Jacinto River contains fishery resources but is not within designated Essential Fish Habitat or NMFS critical habitat for any fish species. The Study Area is located within the Western Riverside County MSHCP.



SOURCE: ESRI, 2026; Vivid Aerial Photograph, 10/7/2025; Riverside County, 2026; Acorn Environmental, 7/1/2026

Figure 4
Habitat Types



SOURCE: USFS, 5/7/2025; ESRI, 2026; Acorn Environmental, 7/1/2026

Figure 5
CNDDB Occurrences

4.5 LISTED SPECIES AND OTHER SPECIAL-STATUS SPECIES

For the purposes of this assessment, "special status" is defined to be species that are of management concern to state or federal natural resource agencies, and include those species that are:

- Listed as endangered, threatened, proposed, or candidate for listing under the Federal Endangered Species Act;
- Listed as endangered, threatened, rare, or proposed for listing, under the California Endangered Species Act of 1970;
- Designated as endangered or rare, pursuant to California Fish and Game Code (§1901);
- Designated as fully protected, pursuant to California Fish and Game Code (§3511, §4700, or §5050);
- Designated as a species of special concern by CDFW;
- Plants considered to be rare, threatened or endangered in California by CNPS; this consists of species with California Rare Plant Rank (CRPR) 1A, 1B, and 2 of the CNPS Ranking System; or
- Plants listed as rare under the California Native Plant Protection Act.

In addition to the listed, proposed, and candidate species identified above, migratory and nesting birds are addressed in this assessment because active nests, eggs, and young are protected under the Migratory Bird Treaty Act and California Fish and Game Code.

4.5.1 Reported Occurrences of Listed Species and Other Special-status Species

A list of special-status plant and animal species that have occurred within the Study Area and vicinity was compiled based upon the following:

- Any previous and readily-available biological resource studies pertaining to the Study Area;
- Informal consultation with USFWS by generating an electronic Species List (Information for Planning and Conservation website at https://ecos.fws.gov/ipac/); and
- A spatial query of the CNDDB and a CNDDB standard 9 quadrangle database report
- A query of the California Native Plant Society's database Inventory of Rare and Endangered Plants of California (online edition).

The CNDDB was queried and any reported occurrences of special-status species were plotted in relation to the Study Area boundary using GIS software (see **Figure 5**). The CNDDB reported the following special-status species occurrences in the immediate vicinity of the Study Area:

- **San Bernardino kangaroo rat (*Dipodomys merriami parvus*)**: The CNDDB record describes the location as "*along the San Jacinto River about 1.0-1.6 miles SE of the Gilman Springs Rd crossing, SE of Gilman Hot Springs*." The kangaroo rat trapping study was performed for the recharge basin & test well construction in 2005 and levee realignment & flood control construction in 2006.
- **Least Bell's vireo (*Vireo bellii pusillus*)**: The CNDDB record describes the location as "*San Jacinto River, between Gilman Hot Springs and Soboba Hot Springs, about 2.6 miles ENE of San Jacinto Reservoir*." This population was detected in years 2003 through 2011.

- **Western spadefoot (*Spea hammondii*)**: The CNDDB record describes the location as "*San Jacinto River, about 1 air mile west of Soboba Hot Springs, San Jacinto*."
- **Coastal California gnatcatcher (*Polioptila californica californica*)**: The CNDDB has several records within the San Jacinto River floodplain in the general vicinity of the Study Area.

Within a 5-mile buffer of the Study Area boundary, the CNDDB reported several additional special-status species occurrences, summarized in the table in **Attachment 3** along with any additional CNPS species.

A USFWS species list was generated online using the USFWS' IPaC Trust Resource Report System (see **Attachment 1**). This list is generated using a regional and/or watershed approach and does not necessarily indicate that the Study Area provides suitable habitat. The following listed species should be considered in the impact assessment:

- San Bernardino Merriam's Kangaroo Rat (Dipodomys merriami parvus) Endangered
- Stephens' Kangaroo Rat (Dipodomys stephensi (incl. D. cascus)) Threatened
- Coastal California Gnatcatcher (Polioptila californica californica) Threatened
- Least Bell's Vireo (Vireo bellii pusillus) Endangered
- Southwestern Willow Flycatcher (Empidonax traillii extimus) Endangered
- Southwestern Pond Turtle (Actinemys pallida) Proposed Threatened
- Arroyo (=arroyo Southwestern) Toad (Anaxyrus californicus) Endangered
- Western Spadefoot (Spea hammondii) Proposed Threatened
- Monarch Butterfly (Danaus plexippus) Proposed Threatened
- Riverside Fairy Shrimp (Streptocephalus woottoni) Endangered
- Vernal Pool Fairy Shrimp (Branchinecta lynchi) Threatened
- Nevin's Barberry (Berberis nevinii) Endangered
- San Diego Ambrosia (Ambrosia pumila) Endangered
- San Jacinto Valley Crownscale (Atriplex coronata var. notatior) Endangered
- Slender-horned Spineflower (Dodecahema leptoceras) Endangered
- Spreading Navarretia (Navarretia fossalis) Threatened
- Thread-leaved Brodiaea (Brodiaea filifolia) Threatened

4.5.2 Listed Species or Special-status Species Observed During Field Survey

During the field survey, no special-status species were detected within the Study Area.

4.5.3 Potential for Listed Species or Special-status Species to Occur in the Study Area

A list of special-status species that occur in the vicinity of the Study Area was compiled from CNDDB queries (**Figure 5**), species lists from USFWS and CNPS (**Attachment 1**; CNPS, 2024), and the MSHCP. A species table is included as **Attachment 3** and provides the species name, status, and habitat requirements of these special-status species. **Attachment 3** provides an analysis of the potential for each species to occur within the Study Area, and the following section provides a more detailed analysis of all species that have at least a moderate potential to occur within the Study Area.

The potential for each special status species to occur in the Study Area was evaluated in **Attachment 3** according to the following criteria:

- **No Potential.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), or is outside of the known range of the species.
- **Low Potential.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.
- **Moderate Potential.** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential.** All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Special-Status Plant Species

The ruderal/developed habitat within the Study Area has a very low to non-existent potential for harboring special-status plant species due to the dominance of aggressive non-native grasses and forbs, the weed control activities, and the lack of specialized habitats such as vernal pools and the lack of specialized soils such as alkaline. According to the Western Riverside County Regional Conservation Authority (2024), the Study Area is not in a narrow endemic plant survey area, so special-status plants are unlikely to occur in the Study Area. *"Narrow endemic plant species"* are defined in the MSHCP as those species that are highly restricted by their habitat affinities, edaphic requirements or other ecological factors, and for which specific conservation measures have been identified in Table 6-1 of Volume I of the MSHCP (County of Riverside, 2003). No special-status plant species were identified in the Study Area during the April survey which encompasses the bloom period for many rare plants.

Special-Status Animals

Animals dependent upon aquatic habitats occur in the vicinity, such as western spadefoot, southwestern pond turtle, and arroyo toad. However, the Study Area does not contain any streams, wetlands or desert washes. The water storage ponds do not provide viable habitat because the ponds fluctuate dramatically in water levels, the levees and bottoms are regularly compacted or scraped free of vegetation, and predatory waterfowl are prevalent. Western spadefoot and arroyo toad are unlikely to occur in the Study Area. The Study Area also lacks suitable basking habitat for southwestern pond turtle.

Special-status burrowing animals have a low potential to exist in the Study Area. San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, and Los Angeles Pocket Mouse are known to occur in the vicinity. However, these mammals require alluvial sage scrub habitat, and this habitat does not exist in the Study Area. A habitat assessment that followed protocol methods determined that habitat requirements were not met for San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, and Los Angeles Pocket Mouse. While some abandoned burrows and gullies indicate potential habitat, the soils are sandy and are mostly unsuitable for burrowing because of their tendency to collapse or erode. Furthermore, EMWD staff manages the grounds and pond banks to be weed-free and they patch holes and gullies for structural stability of the actively maintained infrastructure. Burrowing owl could utilize two small habitat islands within the Study Area: a pile of concrete rubbish and the large soil spoil pile; however, no owl presence or suitable burrows were identified during the field survey conducted.

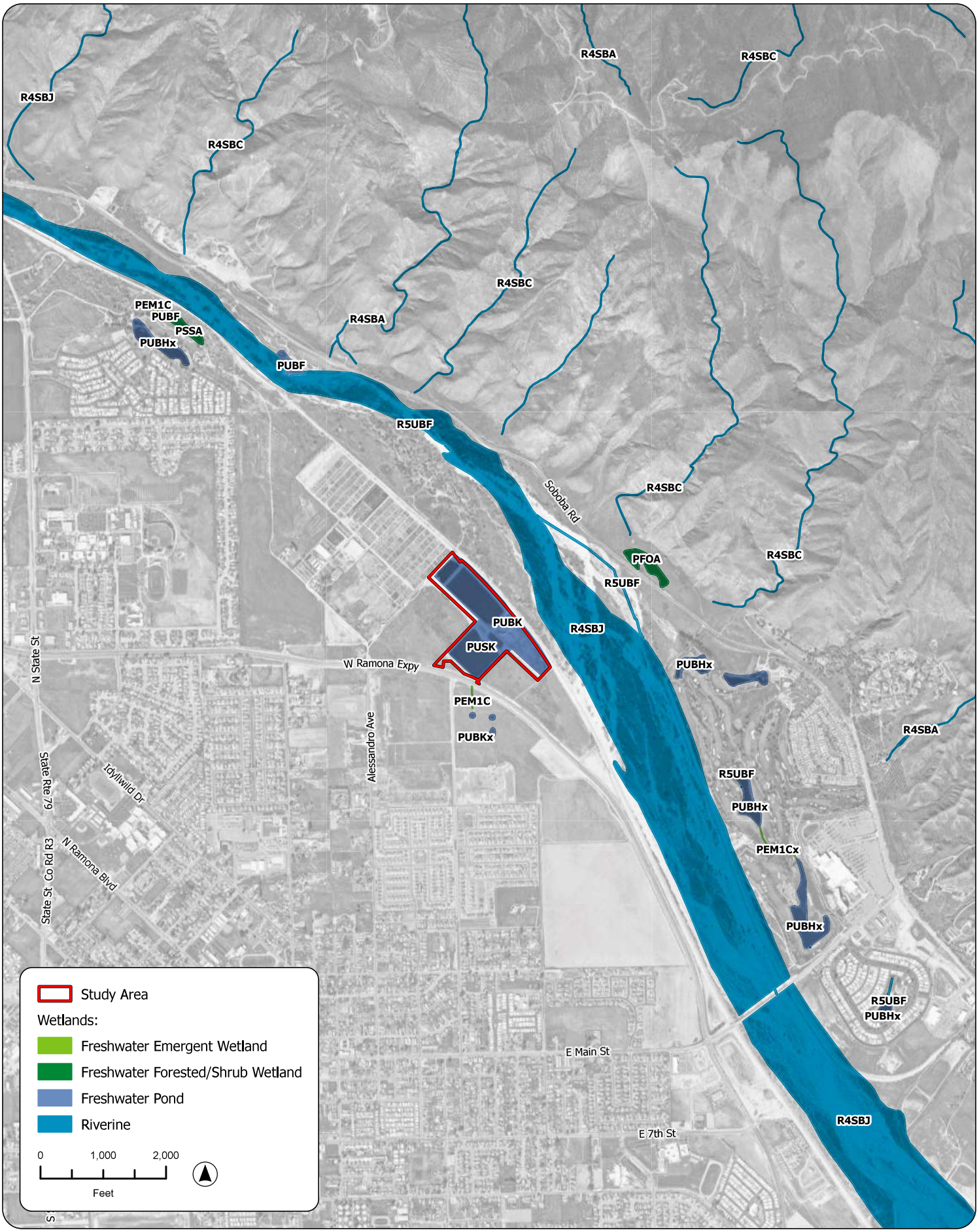
Crotch's bumblebee occurs in California's grasslands, shrublands, chaparral, and coastal sage scrub. They nest underground in abandoned rodent burrows or aboveground in tufts of grass, old bird nests, or rock piles. The Study Area does not have any natural habitat or significant floral/nectar resources; portions of the Study Area that are not regularly trimmed consist of ruderal vegetation (mustards, bromes, tumbleweed). Crotch's bumblebee has only a low potential to occur in the Study Area.

The Study Area is devoid of trees and large bushes; however, weedy grasses and forbs such as bromes, mustards, and tumbleweed provide some cover for ground-nesting birds.

Fairy shrimp (*Branchinecta lynchi, Linderiella santarosae, Streptocephalus woottoni*) also require special consideration. Within the Study Area, there are no vernal pools or seasonal wetlands or soils that create hardpans. Therefore, fairy shrimp have no potential to occur in the Study Area and are not discussed further (**Attachment 3**).

4.6 POTENTIALLY JURISDICTIONAL WATER RESOURCES

The USFWS National Wetland Inventory mapped artificially flooded palustrine features within the Study Area (see **Figure 6**); this mapping corresponds to the recycled water storage ponds. The San Jacinto River is also mapped adjacent to the Study Area. A preliminary assessment for the presence of potentially-jurisdictional water resources within the Study Area was also conducted during the field survey. The field survey determined that the Study Area does not contain any channels or wetlands. The Study Area does have four recycled water ponds that were constructed in uplands (see **Figure 4**). These ponds use pumps to transfer recycled water in and out of these basins. Although some wetland vegetation does grow in the bottom of the ponds when the ponds are drained (especially Pond 2), these are not wetland habitats. The hydrologic cycle is artificial, hydric soils are not present, and vegetation is regularly disturbed or removed by discing, ripping, scraping, or sediment removal. The ruderal fields outside of the facility have been conditioned many years ago for dry-crop agriculture by discing and grading such that water does not pond and form wetlands but instead drains as sheet flow or infiltrates into the sandy soils.



SOURCE: USFS, 5/7/2025; ESRI, 2026; Vivid Aerial Photograph, 10/7/2025; Acorn Environmental, 7/1/2026

Figure 6

National Wetlands Inventory

Section 5 | Impact Analyses and Mitigation Measures

This section establishes the impact criteria, then analyzes potential Project-related impacts upon the known biological resources within the Study Area. Finally, this section suggests mitigation measures to reduce these impacts to a less-than-significant level.

The significance of impacts to biological resources depends upon the proximity and quality of vegetation communities and wildlife habitats, the presence or absence of special-status species, and the effectiveness of measures implemented to protect these resources from Project-related impacts. As defined by CEQA, the Project would be considered to have a significant adverse impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a special-status species in local or regional plans, policies, or regulations, or by USFWS or CDFW
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by USFWS or CDFW
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- Conflict with any county or municipal policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved governmental habitat conservation plan.

5.1 POTENTIAL DIRECT / INDIRECT ADVERSE EFFECTS UPON SPECIAL-STATUS SPECIES

Will the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No special-status species were detected during the biological survey of the Study Area, and no known populations of special-status species have been reported within the Study Area. As described in **Section 4**, the Study Area consists of an existing recycled water storage facility that is regularly maintained and is dominated by ruderal/developed habitat and artificial open-water storage ponds. The Proposed Project would temporarily disturb the Study Area during construction. Because the Study Area lacks natural vegetation communities and is subject to ongoing disturbance and maintenance, direct impacts to special-status species are not expected. However, construction activities could result in temporary direct or indirect effects to individual wildlife if special-status species move into the work area before or during

construction, or if nesting birds establish nests in vegetation or structures prior to vegetation removal or ground disturbance. Recommended avoidance and minimization measures are provided below to reduce these potential impacts.

Special-Status Plants

No special-status plant species were observed during the field survey. The Study Area does not contain natural plant communities, vernal pools, alkaline soils, or other specialized habitats typically required by special-status plant species known from the vicinity. The Study Area is also subject to routine vegetation control, including disking, scraping, trimming, and herbicide application. Construction would occur within these existing disturbed and maintained areas and would not remove or convert native vegetation communities. Therefore, the Proposed Project is not expected to result in direct or indirect impacts to special-status plants.

Burrowing Animals

Special-status burrowing animals have a low potential to exist in the Study Area. San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, and Los Angeles Pocket Mouse are known to occur in the vicinity. However, these mammals require alluvial sage scrub habitat, and this habitat does not exist in the Study Area. A habitat assessment that followed protocol methods determined that habitat requirements were not met for San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, and Los Angeles Pocket Mouse. While some abandoned burrows and gullies indicate potential habitat, the soils are sandy and are mostly unsuitable for burrowing because of their tendency to collapse or erode and because EMWD staff manages the grounds and pond banks to be weed-free and they patch holes and gullies. Burrowing owl could utilize two small habitat islands within the Study Area: a pile of concrete rubbish and the large soil spoil pile; no owl presence or suitable burrows were identified.

Because suitable habitat is absent or marginal, impacts to special-status burrowing mammals are not expected. However, individual wildlife could move through or temporarily occupy portions of the Study Area prior to construction, particularly near marginal features such as the soil stockpile, concrete debris, or disturbed open areas. Burrowing owls were not observed and no suitable occupied burrows were identified during the field survey; however, because burrowing owl can occupy disturbed open areas and artificial debris features, ground disturbance or removal of the soil stockpile or debris piles could result in direct impacts if burrowing owl occupies the site before construction. Pre-construction surveys and construction best management practices are recommended to avoid potential impacts to burrowing owl and other special-status wildlife.

Special-Status Insects

Suitable habitat for Crotch's bumble bee includes grasslands, shrublands, chaparral, coastal sage scrub, and other habitats that support suitable nectar resources and nesting opportunities. The Study Area does not contain natural grassland, shrubland, chaparral, or coastal sage scrub, and floral resources are limited to disturbed ruderal vegetation such as mustards, bromes, and tumbleweed in areas not actively maintained. Construction would occur within the existing maintained facility and would not remove high-quality foraging, nesting, or overwintering habitat for Crotch's bumble bee. Therefore, the Proposed Project is not expected to result in substantial direct or indirect impacts to Crotch's bumble bee.

Special-Status Reptiles and Amphibians

Special-status aquatic or semi-aquatic reptiles and amphibians known to occur in the surrounding area include southwestern pond turtle, western spadefoot, and arroyo toad. The Study Area does not contain natural streams, washes, riparian habitat, vernal pools, or wetlands. The recycled water storage ponds do not provide suitable breeding or refugia habitat for western spadefoot or arroyo toad and lack suitable basking sites for southwestern pond turtle. Project construction would not occur within the San Jacinto River or its riparian habitat. Therefore, direct impacts to southwestern pond turtle, western spadefoot, and arroyo toad are not expected. However, because these species are known from the broader region and individuals could disperse during favorable conditions, general construction best management practices, worker awareness training, and pre-construction wildlife surveys are recommended to avoid impacts if wildlife is present in the work area at the time of construction.

Special-Status Birds and Nesting Birds in General

Special-status bird species may occur in the vicinity of the Study Area, including coastal California gnatcatcher, southwestern willow flycatcher, and least Bell's vireo. Suitable nesting habitat for these species is not present within the Study Area because the site lacks coastal sage scrub and riparian woodland/scrub. Riparian habitat associated with least Bell's vireo and southwestern willow flycatcher occurs outside the Study Area in the San Jacinto River corridor, separated from the facility by the existing levee and fencing. Therefore, the Proposed Project is not anticipated to directly affect special-status birds. Special-status bird species in suitable habitat outside of the Study Area could be indirectly affected by construction noise, vibration, dust, or human activity if vegetation removal, ground disturbance, pond work, or construction activities occur during the nesting season. Implementation of pre-construction nesting bird surveys and avoidance buffers, if active nests are found, would reduce potential impacts to nesting birds to a less-than-significant level.

5.1.1 Recommended Measures

Worker Awareness Training

Prior to construction, all construction workers shall take part in a worker environmental awareness program (WEAP) conducted by a qualified biologist. Special-status species to be covered in the WEAP program include, but are not limited to: San Bernardino kangaroo rat, Stephens' kangaroo rat, San Diego black-tailed jackrabbit, San Diego desert woodrat, southern grasshopper mouse, Los Angeles pocket mouse, southwestern pond turtle, arroyo toad, burrowing owl, and nesting birds in general. This training shall include a description of the listed species with the potential to occur in the work area, their habitat needs, an explanation of the status of the species and protection under federal and/or State law, and a list of the measures being taken to avoid or reduce impacts to the species during project construction. The curriculum shall also identify the limits of the construction areas and restrictions on movement of personnel and equipment and applicable construction best management practices. The awareness program shall be conducted at the start of construction and thereafter as required for new construction personnel. The training shall include a handout or video containing all training information. The project manager shall use these training materials to train any additional construction personnel that were not in attendance at the first meeting, prior to starting work on the project.

Pre-Construction Wildlife Surveys

General Wildlife Survey

A pre-construction survey for special-status species shall be conducted within 14 days of initial ground-disturbing activities. The focal species are San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, Los Angeles Pocket Mouse, burrowing owl, and Crotch's bumblebee. If special-status wildlife is observed, a qualified biologist shall determine appropriate avoidance measures, which may include allowing the animal to leave the work area on its own, establishing an avoidance buffer, or consulting with CDFW and/or USFWS if a listed species is detected.

Burrowing Owl

The pre-construction survey for the burrowing owl shall be in accordance with the CDFW Staff Report on Burrowing Owl Mitigation (CDFW, 2012). The initial take avoidance survey shall occur no less than 14 days prior to initiating ground-disturbing activities, with a final survey conducted within 24 hours prior to initiating ground-disturbing activities. If, after the initial take avoidance survey, no suitable burrowing owl habitat, including burrows, is present, then the second survey 24 hours prior to ground disturbance is not required. If no active burrowing owl burrows (nesting sites) are identified within the potential impact area of the project during the take avoidance surveys, then no additional action is required.

If active burrowing owl burrows are identified within the potential impact area, the project shall avoid disturbing active burrowing owl burrows (nesting sites) and burrowing owl individuals. Buffers shall be established around occupied burrows in accordance with guidance provided in the CDFW Staff Report on Burrowing Owl Mitigation (CDFW, 2012) based on the proposed level of disturbance. For low disturbance projects, initial setback distances for avoidance of active burrows shall be 200 meters (approximately 656 feet) from April 1 to October 15 and 50 meters (164 feet) from October 16 to March 31. Exceptions can be made to the avoidance distance for areas with natural (hills, trees) or artificial (buildings, walls) barriers in place. The final avoidance buffer shall be at the discretion of the biologist. If, after consideration of a reduced buffer, an adequate avoidance buffer cannot be provided between an occupied burrow and required ground-disturbing activities, then passive relocation activities during the non-breeding season (September 1 through January 31) may be authorized in consultation with CDFW, which would include preparation, approval, and implementation of a Burrowing Owl Exclusion Plan in accordance with protocol described in the CDFW Staff Report on Burrowing Owl Mitigation.

Other Nesting Birds

If construction activities occur during the nesting season (February 15 to August 31), pre-construction surveys for the presence of nesting birds shall be conducted by a qualified biologist within 500 feet of proposed construction areas and within 7 days of the start of vegetation removal or ground disturbing activities using binoculars where access is limited. If active nests are identified, the qualified biologist shall determine a suitable avoidance buffer based on the needs of the species observed. Avoidance measures shall include establishment of a buffer zone using construction fencing or the postponement of vegetation removal until after the nesting season, until after a qualified biologist has determined the young have fledged and the nest is otherwise inactive. Avoidance buffers may vary in size depending on the species' life history requirements, habitat characteristics, project-related activities, and disturbance levels.

Implement Construction Best Management Practices

Construction best management practices shall be implemented. Following are specific examples:

- Because kangaroo rats are nocturnal, no construction activity shall take place at night. In particular, trenching, backfilling, compacting, and other ground-disturbing activities are restricted to daylight hours.
- Trenches outside of the ponds shall be filled or tightly covered at the end of each workday. For trenches that must remain open, animal escape mechanisms shall be installed. This may consist of putting boards in trenches or creating shallow slopes at the ends of trenches so that animals may crawl out.
- Ensure that there are no animals present before trenches are filled or pipes are used.
- Pipe openings shall be covered so that no animals are able to enter pipes.
- Do not feed animals; do not litter; ensure that trash receptacles are closed tightly.
- Before any ground disturbance begins, the contractor shall delineate and mark all limits of construction using temporary construction fencing, exclusion fencing, or other clear work-limit demarcation clearly visible to all personnel to prevent construction activities from extending outside approved work limits, including along the northeastern facility boundary where work occurs adjacent to the San Jacinto River levee and where existing perimeter fencing is temporarily removed or relocated. All construction-related activities by contractors, subcontractors, or their agents and equipment (including staging, materials storage, and personnel parking areas) shall be restricted to the designated limits of construction and staging areas. The demarcation shall be maintained until construction in the adjacent work area is complete.
- All disturbed areas shall be restored to their original condition. Trenches shall be backfilled and compacted, and the original ground contours restored. Paved areas shall be repaved. Unpaved areas will be reseeded with a native seed mix and mulch applied where appropriate or stabilized using other erosion-control measures suitable for the existing EMWD facility operations.

5.2 POTENTIAL DIRECT / INDIRECT ADVERSE EFFECTS UPON SPECIAL-STATUS HABITATS OR NATURAL COMMUNITIES OR CORRIDORS

Will the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The CNDDB maps the sensitive habitat “Southern Cottonwood Willow Riparian Forest” in the Study Area; however, the field surveys confirmed that the entire Study Area consists of ruderal/developed habitat and artificial recycled water storage ponds. No sensitive habitats or natural communities are located within the Study Area. The Study Area is not within any designated listed species’ critical habitat, although designated critical habitat for San Bernardino Merriam’s kangaroo rat occurs nearby in the San Jacinto River corridor on the opposite side of the adjacent levee. There is sensitive habitat (Southern Cottonwood Willow Riparian Forest) nearby in the San Jacinto River floodplain, but the Study Area is separated from this habitat by fencing and a large levee. The Proposed Project would occur within the existing maintained facility and would not directly or indirectly impact special-status habitats, sensitive natural communities, or designated critical habitat.

5.2.1 Recommended Measures

No measures are required.

5.3 POTENTIAL DIRECT / INDIRECT ADVERSE EFFECTS ON JURISDICTIONAL WATER RESOURCES

Will the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Potential direct impacts to water resources could occur during construction by modification or destruction of stream banks or riparian vegetation or the filling of wetlands or channels. However, there are no jurisdictional water resources within the Study Area; therefore, project implementation will not directly impact jurisdictional water resources.

Indirect effects to surface water quality could occur during construction activities that mobilize soil and create the potential for stormwater transport of sediment from disturbed soils or by accidental release of hazardous materials or petroleum products from sources such as heavy equipment servicing or refueling. To minimize potential risks to water quality, the Proposed Project must enroll under the Construction General Permit prior to the initiation of construction. In conjunction with enrollment under this Permit, a Storm Water Pollution Prevention Plan, Erosion Control Plan, and a Hazardous Materials Management/Spill Response Plan must be prepared and implemented during construction to avoid or minimize the potential for erosion, sedimentation, or accidental release of hazardous materials. Implementation of these measures mandated by law would reduce potential construction-related impacts to water quality to a less-than-significant level. There will be no adverse impacts to jurisdictional water resources during operation of the project because the recycled water storage facility does not discharge to, and is not connected to, jurisdictional water resources.

5.3.1 Recommended Measures

No measures are necessary.

5.4 POTENTIAL IMPACTS TO WILDLIFE MOVEMENT, CORRIDORS, ETC.

Will the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The Study Area is surrounded by fencing, and facility maintenance activities, which discourage animal occupation. Outside of the Study Area, the San Jacinto River and its floodplain serve as a wildlife corridor and seasonal fishery. The Study Area is separated from this corridor by a large levee and by fencing. Project implementation will not create any new barriers, so project implementation will not impact wildlife movement or established wildlife corridors.

5.4.1 Recommended Measures

No measures are necessary.

5.5 POTENTIAL CONFLICTS WITH ORDINANCES, HABITAT CONSERVATION PLANS, ETC.

Will the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Will the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

5.5.1 Local Policies or Ordinances

Implementation of the proposed project will not require the removal of any trees, so there will be no conflict with applicable tree ordinances.

5.5.2 Conservation Planning Analysis

There are two habitat conservation plans (HCPs) in the region – the Stephens' Kangaroo Rat (SKR) HCP and the Western Riverside County MSHCP.

Stephens' Kangaroo Rat HCP

The Study Area is located within the SKR HCP Plan Area but is not near any designated core areas for the HCP. As described above, the Study Area is already developed and does not provide suitable habitat for SKR and would not result in any conflicts with this HCP.

MSHCP

Approximately 1.5 acres of the eastern portion of Pond 2 is within a MSHCP Criteria Cell (2893) (**Figure 3**). In addition, the Study Area is adjacent to the San Jacinto River which is designated as MSHCP Conserved Public-Quasi-Public Lands. Because EMWD is not a signatory to the MSHCP, the Proposed Project is not required to obtain MSHCP consistency approval or rely on MSHCP take coverage unless EMWD elects to participate as a Special Entity or such participation is otherwise required by an approving/permitting agency. The potential for the Proposed Project to conflict with the MSHCP is analyzed in compliance with CEQA.

Reserve Assembly Goals

A key component of the MSHCP is to conserve habitat needed to protect the 146 animal and plant species protected by the plan. The habitat conservation goals of the MSHCP include assembling 153,000 acres of Additional Reserve Lands within specific areas identified in "criteria cells." As noted above, a portion of the Study Area is located within MSHCP Criteria Cell 2893, which is one of four criteria cells that make up Cell Group Z. The conservation goal for this cell group is 5% of the cell group and is focused on grassland habitat in the southwest portion of the cell group. The Study Area has already been developed, does not contain grassland habitat, and is not located in the southwest portion of the cell group (County of

Riverside, 2003). Accordingly, the Proposed Project would not affect the MSHCP Reserve Assembly goals for Cell Group Z.

Riparian/Riverine and Vernal Pool Habitat Protection

Section 6.1.2 of the MSHCP addresses the protection of riparian/riverine areas, vernal pools, and the species that depend on these habitat types. As identified in **Sections 4.2** and **4.6**, the Study Area does not include any riparian/riverine or vernal pool habitat. Accordingly, the Proposed Project would not affect the riparian/riverine or vernal pools habitat.

Protection of Narrow Endemic Plant Species

Section 6.1.3 of the MSHCP addresses the protection of plant species endemic to a limited range. The Study Area is not located within a designated narrow endemic plant survey area. Additionally, as noted in **Section 4.2**, facility maintenance requires the control or absence of vegetation, so the Study Area is regularly disced, ripped, scraped, trimmed, or has herbicides applied. Areas not actively managed for weed control have non-native annual grasses and weedy forbs. Accordingly, the Proposed Project would not affect narrow endemic plant species.

Urban/Wildlands Interface

Section 6.1.4 of the MSHCP addresses urban development in proximity to MSHCP conservation areas. The Study Area is located in proximity to the San Jacinto River, which is identified as protected public/quasi-public conserved lands under the MSHCP. Section 6.1.4 addresses potential indirect impacts to conservation areas associated with changes in drainage, lighting and noise and the introduction of toxics and invasive species. The Proposed Project would increase the water storage capacity of the four existing ponds but will not otherwise alter the existing land uses or operations in the Study Area. No changes would occur to drainage, lighting and noise except for temporary construction noise. Construction and operation of the Proposed Project would not introduce toxics or invasive species.

Additional Survey Needs

Section 6.3.2 of the MSHCP identifies survey needs to ensure development does not impact certain species. The Study Area is located in an area for which the MSHCP prescribes surveys for burrowing owl, San Bernardino Merriam's Kangaroo Rat, and Los Angeles Pocket Mouse. As identified in **Section 3.2**, a field survey was conducted to identify species and habitat present. As described in **Section 4.5.3**, a habitat assessment that followed protocol methods determined that habitat requirements were not met for San Bernardino Merriam's Kangaroo Rat, Stephens' Kangaroo Rat, and Los Angeles Pocket Mouse. Burrowing owl could utilize two small habitat islands within the Study Area: a pile of concrete rubbish and the large soil spoil pile; however, no owl presence or suitable burrows were identified. While the survey did not identify the presence of San Bernardino Merriam's Kangaroo Rat, Los Angeles Pocket Mouse, burrowing owl, or other special-status species, mitigation measures identified in **Section 5.1.1** include a pre-construction survey to ensure that impacts to these species are avoided.

5.5.3 Recommended Measures

No additional measures beyond those identified in **Section 5.1.1** are necessary.

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Section 7 | Qualifications of Surveyors and Authors

G.O. Graening, Ph.D., M.S.E.

G. O. Graening holds a Doctorate in Biological Sciences and a Master of Science in Biological Engineering, and is a certified arborist (International Society of Arboriculture). Dr. Graening has 26 years of experience in environmental assessment and research, including the performance of numerous wetland delineations and aquatic restoration projects. Dr. Graening also served as an adjunct professor of biology at California State University Sacramento for 10 years and was an active researcher in the area of conservation biology and groundwater ecology.

Jennifer Wade, Principal

Jennifer Wade is an environmental specialist with over 20 years' experience in the environmental consulting field, including biological surveys and oversight of biological resources reports. Ms. Wade has assisted federal agencies with Section 7 Endangered Species Act consultation and Clean Water Act Section 404/401 permitting and certification. Prior to founding Acorn Environmental, she was the Northern California Land Management Program Manager within the Biological Resources group at Environmental Science Associates. Ms. Wade leads the Acorn biological resources group.

Attachment 1: USFWS Species List

Attachment 1

Species Lists

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901

In Reply Refer To: 04/23/2026 00:22:49 UTC
Project Code: 2026-0080328
Project Name: EMWD Alessandro Ponds Improvement Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A biological assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a biological assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a biological assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found at the Fish and Wildlife Service's Endangered Species Consultation website at:

https://www.fws.gov/service/esa-section-7-consultation

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

PROJECT SUMMARY

Project Code: 2026-0080328
Project Name: EMWD Alessandro Ponds Improvement Project
Project Type: Water Supply Facility - Maintenance / Modification
Project Description: modification/expansion of water treatment ponds
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.80307455,-116.94812494148232,14z



Counties: Riverside County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 17 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
San Bernardino Merriam's Kangaroo Rat *Dipodomys merriami parvus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2060	Endangered
Stephens' Kangaroo Rat *Dipodomys stephensi (incl. D. cascus)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3495	Threatened

BIRDS

NAME	STATUS
Coastal California Gnatcatcher *Polioptila californica californica* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8178 General project design guidelines: https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf	Threatened
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945 General project design guidelines: https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf	Endangered
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749 General project design guidelines: https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf	Endangered

REPTILES

NAME	STATUS
Southwestern Pond Turtle *Actinemys pallida* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4768 General project design guidelines: https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf	Proposed Threatened

AMPHIBIANS

NAME	STATUS
Arroyo (=arroyo Southwestern) Toad *Anaxyrus californicus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat.	Endangered

NAME STATUS

Species profile: https://ecos.fws.gov/ecp/species/3762
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf

Western Spadefoot *Spea hammondii* Proposed Threatened
Population: Southern DPS
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5425
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf

INSECTS

NAME STATUS

Monarch Butterfly *Danaus plexippus* Proposed Threatened
There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/9743
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf

CRUSTACEANS

NAME STATUS

Riverside Fairy Shrimp *Streptocephalus woottoni* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8148
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf

Vernal Pool Fairy Shrimp *Branchinecta lynchi* Threatened
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/REH5EVNH55D5RMGM2GJMLLSXL4/documents/generated/11337.pdf

FLOWERING PLANTS

NAME STATUS

Nevin's Barberry *Berberis nevinii* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8025

San Diego Ambrosia *Ambrosia pumila* Endangered

NAME	STATUS
There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8287	
San Jacinto Valley Crownscale *Atriplex coronata var. notatior* There is **final** critical habitat for this species. However, no *actual* acres or miles were designated due to exemptions or exclusions. See Federal Register publication for details. Species profile: https://ecos.fws.gov/ecp/species/4353	Endangered
Slender-horned Spineflower *Dodecahema leptoceras* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4007	Endangered
Spreading Navarretia *Navarretia fossalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1334	Threatened
Thread-leaved Brodiaea *Brodiaea filifolia* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6087	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: G.O. Graening
Address: 343 Carpenter Hill Road
City: Folsom
State: CA
Zip: 95630
Email ggraening@gmail.com
Phone: 9164525442

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (San Jacinto (3311678) OR El Casco (3311781) OR Beaumont (3311688) OR Cabazon (3311687) OR Lake Fulmor (3311677) OR Blackburn Canyon (3311667) OR Hemet (3311668) OR Winchester (3311761) OR Lakeview (3311771))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Abronia villosa var. aurita chaparral sand-verbena	G5T2? S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	1,450 3,340	98 S:17	0	0	1	1	2	13	12	5	15	1	1
Agelaius tricolor tricolored blackbird	G3 S2	None Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered USFWS_BCC-Birds of Conservation Concern	1,417 2,057	960 S:13	1	0	0	0	0	12	4	9	13	0	0
Aimophila ruficeps canescens southern California rufous-crowned sparrow	G5T3 S4	None None	CDFW_WL-Watch List	1,480 2,729	235 S:18	1	7	1	0	0	9	13	5	18	0	0
Allium marvinii Yucaipa onion	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,355 4,950	47 S:8	0	3	1	0	0	4	0	8	8	0	0
Allium munzii Munz's onion	G1 S1	Endangered Threatened	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	2,190 2,190	21 S:1	1	0	0	0	0	0	0	1	1	0	0
Anaxyrus californicus arroyo toad	G1G2 S2	Endangered None	CDFW_SSC-Species of Special Concern IUCN_EN-Endangered	2,625 2,625	139 S:1	0	0	0	0	0	1	1	0	1	0	0
Anniella stebbinsi Southern California legless lizard	G3 S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	1,500 5,092	427 S:14	0	7	4	0	0	3	6	8	14	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Antrozous pallidus pallid bat	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,690 2,207	425 S:2	0	1	0	0	0	1	1	1	2	0	0
Aquila chrysaetos golden eagle	G5 S3	None None	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected CDFW_WL-Watch List IUCN_LC-Least Concern	2,175 2,300	332 S:2	1	0	0	0	0	1	1	1	2	0	0
Arizona elegans occidentalis California glossy snake	G5T2 S2	None None	CDFW_SSC-Species of Special Concern	1,450 1,882	260 S:10	0	0	0	0	0	10	4	6	10	0	0
Artemisiospiza belli belli Bell's sparrow	G5T2T3 S3	None None	CDFW_WL-Watch List	1,480 2,700	61 S:7	1	0	0	0	0	6	7	0	7	0	0
Aspidoscelis hyperythra orange-throated whiptail	G5 S2S3	None None	CDFW_WL-Watch List IUCN_LC-Least Concern USFS_S-Sensitive	1,500 2,620	369 S:21	2	5	2	1	1	10	21	0	20	1	0
Aspidoscelis tigris stejnegeri coastal whiptail	G5T5 S3	None None	CDFW_SSC-Species of Special Concern	1,500 2,768	148 S:9	0	1	0	1	0	7	6	3	9	0	0
Astragalus hornii var. hornii Horn's milk-vetch	GUT1 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive		28 S:1	0	0	0	0	0	1	1	0	1	0	0
Astragalus lentiginosus var. coachellae Coachella Valley milk-vetch	G5T1 S1	Endangered None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	2,280 2,280	69 S:1	0	0	0	0	1	0	1	0	0	1	0
Astragalus pachypus var. jaegeri Jaeger's milk-vetch	G4T1 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,000 3,400	18 S:7	0	0	0	1	0	6	6	1	7	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Astur cooperii Cooper's hawk	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	790 1,509	121 S:2	0	0	2	0	0	0	1	1	2	0	0
Athene cunicularia burrowing owl	G4 S2	None Candidate Endangered	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,425 2,283	2513 S:57	10	13	8	2	1	23	20	37	56	1	0
Atriplex coronata var. notatior San Jacinto Valley crownscale	G4T1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	130 1,510	16 S:12	3	3	1	0	1	4	4	8	11	1	0
Atriplex parishii Parish's brittlescale	G1G2 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CRES-San Diego Zoo CRES Native Gene Seed Bank USFS_S-Sensitive	1,420 1,500	15 S:3	1	0	0	0	1	1	3	0	2	1	0
Atriplex serenana var. davidsonii Davidson's saltscale	G5T1 S1	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,427 1,510	26 S:8	0	1	1	0	0	6	4	4	8	0	0
Bombus crotchii Crotch's bumble bee	G2 S2	None Candidate Endangered	IUCN_EN-Endangered	1,586 3,300	1075 S:14	0	0	0	0	0	14	6	8	14	0	0
Bombus pensylvanicus American bumble bee	G3G4 S2	None None	IUCN_VU-Vulnerable	1,484 3,436	810 S:6	0	0	0	0	0	6	5	1	6	0	0
Branchinecta lynchi vernal pool fairy shrimp	G3 S3	Threatened None	IUCN_VU-Vulnerable	1,500 1,500	804 S:1	0	1	0	0	0	0	1	0	1	0	0
Brodiaea filifolia thread-leaved brodiaea	G2 S2	Threatened Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	498 1,432	141 S:4	0	2	1	0	0	1	1	3	4	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Buteo regalis ferruginous hawk	G4 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,440 2,200	107 S:6	1	2	1	0	0	2	3	3	6	0	0
Calochortus palmeri var. munzii San Jacinto mariposa-lily	G3T3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	4,850 4,985	48 S:2	0	0	0	0	0	2	0	2	2	0	0
Calochortus palmeri var. palmeri Palmer's mariposa-lily	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	3,780 3,780	111 S:1	1	0	0	0	0	0	0	1	1	0	0
Calochortus plummerae Plummer's mariposa-lily	G4 S4	None None	Rare Plant Rank - 4.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,800 4,650	230 S:19	0	4	0	0	2	13	12	7	17	2	0
Calochortus weedii var. intermedius intermediate mariposa-lily	G3G4T3 S3	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,170 2,500	197 S:2	0	0	0	0	0	2	1	1	2	0	0
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	G5T3Q S2	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	1,640 1,640	157 S:1	0	0	0	0	0	1	1	0	1	0	0
Canyon Live Oak Ravine Forest Canyon Live Oak Ravine Forest	G3 S3.3	None None		3,120 3,900	50 S:2	0	0	0	0	0	2	2	0	2	0	0
Caulanthus simulans Payson's jewelflower	G4 S4	None None	Rare Plant Rank - 4.2 SB_CRES-San Diego Zoo CRES Native Gene Seed Bank USFS_S-Sensitive	1,940 3,000	31 S:7	0	0	0	0	0	7	7	0	7	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Centromadia pungens ssp. laevis smooth tarplant	G3G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,400 2,221	137 S:54	1	6	8	3	5	31	27	27	49	2	3
Chaetodipus fallax fallax northwestern San Diego pocket mouse	G5T3T4 S3S4	None None		1,500 2,800	101 S:20	2	7	6	0	0	5	16	4	20	0	0
Chaetodipus fallax pallidus pallid San Diego pocket mouse	G5T3T4 S3S4	None None		1,760 3,000	79 S:4	0	0	0	0	0	4	4	0	4	0	0
Charina bottae umbratica southern rubber boa	G4T2 S2	None Threatened	IUCN_VU-Vulnerable USFS_S-Sensitive	5,000 5,557	94 S:2	0	1	0	0	0	1	1	1	2	0	0
Chorizanthe parryi var. parryi Parry's spineflower	G3T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	1,520 3,555	150 S:45	4	5	2	1	5	28	25	20	40	0	5
Chorizanthe polygonoides var. longispina long-spined spineflower	G5T3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	1,415 2,300	166 S:3	0	1	0	0	0	2	1	2	3	0	0
Chorizanthe xanti var. leucotheca white-bracted spineflower	G4T3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture USFS_S-Sensitive	1,650 4,800	59 S:15	7	1	0	0	0	7	3	12	15	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Circus hudsonius northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,498 1,498	82 S:1	0	1	0	0	0	0	1	0	1	0	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T2T3 S1	Threatened Endangered	BLM_S-Sensitive USFS_S-Sensitive	1,500 1,500	165 S:1	0	0	0	0	0	1	1	0	1	0	0
Coleonyx variegatus abbotti San Diego banded gecko	G5T5 S1S2	None None	CDFW_SSC-Species of Special Concern	1,800 2,000	8 S:2	0	0	0	0	0	2	2	0	2	0	0
Corynorhinus townsendii Townsend's big-eared bat	G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	2,000 5,840	635 S:2	0	0	0	0	0	2	1	1	2	0	0
Crotalus ruber red-diamond rattlesnake	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,499 3,000	192 S:15	2	0	0	0	0	13	15	0	15	0	0
Cypseloides niger black swift	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFWS_BCC-Birds of Conservation Concern	2,080 4,400	46 S:4	1	1	0	0	0	2	4	0	4	0	0
Deinandra mohavensis Mojave tarplant	G3 S3	None Endangered	Rare Plant Rank - 1B.3 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	1,520 5,200	84 S:28	0	4	3	0	0	21	16	12	28	0	0
Desert Fan Palm Oasis Woodland Desert Fan Palm Oasis Woodland	G3 S3.2	None None		1,680 1,680	80 S:1	0	0	0	0	0	1	1	0	1	0	0
Dipodomys merriami parvus San Bernardino kangaroo rat	G5T1 S1	Endangered Endangered	CDFW_SSC-Species of Special Concern	1,452 2,466	76 S:15	0	1	1	0	1	12	6	9	14	1	0
Dipodomys stephensi Stephens' kangaroo rat	G2 S3	Threatened Threatened	IUCN_VU-Vulnerable	1,460 2,700	226 S:38	3	6	9	3	7	10	34	4	31	3	4

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Dodecahema leptoceras slender-horned spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	1,800 3,000	42 S:7	1	1	3	0	0	2	1	6	7	0	0
Elanus leucurus white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	1,476 2,074	190 S:4	0	0	2	0	0	2	1	3	4	0	0
Empidonax traillii extimus southwestern willow flycatcher	G5T2 S3	Endangered Endangered		790 2,400	75 S:2	0	1	1	0	0	0	2	0	2	0	0
Eremophila alpestris actia California horned lark	G5T4Q S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,480 2,430	94 S:2	0	0	0	1	0	1	2	0	2	0	0
Euphydryas editha quino quino checkerspot butterfly	G4G5T1T2 S1S2	Endangered Candidate Endangered		1,600 2,650	185 S:2	0	0	0	0	0	2	2	0	2	0	0
Galium angustifolium ssp. jacinticum San Jacinto Mountains bedstraw	G5T2? S2?	None None	Rare Plant Rank - 1B.3 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	4,750 5,846	19 S:6	0	3	0	0	0	3	4	2	6	0	0
Galium californicum ssp. primum Alvin Meadow bedstraw	G5T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	4,800 5,700	12 S:3	0	1	1	0	0	1	1	2	3	0	0
Horkelia cuneata var. puberula mesa horkelia	G4T1 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,300 2,300	103 S:1	0	0	0	0	1	0	1	0	0	1	0
Icteria virens yellow-breasted chat	G5 S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	2,064 2,064	101 S:1	0	1	0	0	0	0	0	1	1	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Imperata brevifolia California satintail	G3 S3	None None	Rare Plant Rank - 2B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden USFS_S-Sensitive	4,900 4,900	32 S:1	0	0	0	0	0	1	1	0	1	0	0
Lanius ludovicianus loggerhead shrike	G4 S4	None None	CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	1,473 2,596	110 S:8	2	5	1	0	0	0	7	1	8	0	0
Lasiurus xanthinus western yellow bat	G4G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,560 3,200	58 S:4	0	0	0	0	0	4	4	0	4	0	0
Lasthenia glabrata ssp. coulteri Coulter's goldfields	G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	1,420 1,535	109 S:20	4	3	3	1	0	9	8	12	20	0	0
Lepidium virginicum var. robinsonii Robinson's pepper-grass	G5T3 S3	None None	Rare Plant Rank - 4.3	1,125 2,190	142 S:7	0	0	0	0	0	7	7	0	7	0	0
Lepus californicus bennettii San Diego black-tailed jackrabbit	G5T3T4 S3S4	None None		1,470 3,261	103 S:12	1	9	0	0	0	2	11	1	12	0	0
Lilium parryi lemon lily	G3 S3	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank USFS_S-Sensitive	4,300 5,360	160 S:4	0	0	0	0	0	4	0	4	4	0	0
Mentzelia tricuspis spiny-hair blazing star	G4 S2	None None	Rare Plant Rank - 2B.1		16 S:1	0	0	0	0	0	1	1	0	1	0	0

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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Monardella nana ssp. leptosiphon San Felipe monardella	G4G5T2Q S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank USFS_S-Sensitive	5,600 6,690	40 S:4	0	0	0	0	0	4	4	0	4	0	0
Myosurus minimus ssp. apus little mousetail	G5T2Q S2	None None	Rare Plant Rank - 3.1 SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	1,450 1,500	24 S:3	0	2	0	1	0	0	3	0	3	0	0
Nama stenocarpa mud nama	G4G5 S1S2	None None	Rare Plant Rank - 2B.2	1,417 1,421	33 S:2	0	1	0	0	0	1	0	2	2	0	0
Navarretia fossalis spreading navarretia	G2 S2	Threatened None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	1,430 1,510	82 S:7	2	1	1	1	0	2	1	6	7	0	0
Neotoma lepida intermedia San Diego desert woodrat	G5T3T4 S3S4	None None		1,450 2,640	132 S:10	1	5	3	0	0	1	4	6	10	0	0
Onychomys torridus ramona southern grasshopper mouse	G5T3 S3	None None	CDFW_SSC-Species of Special Concern	1,800 2,000	28 S:2	0	0	0	0	0	2	2	0	2	0	0
Orcuttia californica California Orcutt grass	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	1,495 1,495	38 S:1	0	1	0	0	0	0	1	0	1	0	0
Palaeoxenus dohrni Dohrn's elegant eucnemid beetle	G3? S1S2	None None		5,374 5,374	3 S:1	0	0	0	0	0	1	0	1	1	0	0

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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Penstemon californicus California beardtongue	G3 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture USFS_S-Sensitive	3,840 3,840	12 S:2	0	0	0	0	0	2	2	0	2	0	0
Perognathus longimembris brevinasus Los Angeles pocket mouse	G5T2 S1S2	None None	CDFW_SSC-Species of Special Concern	1,450 3,000	70 S:33	7	10	4	1	0	11	14	19	33	0	0
Petalonyx linearis narrow-leaf sandpaper-plant	G4 S3?	None None	Rare Plant Rank - 2B.3		26 S:1	0	0	0	0	0	1	1	0	1	0	0
Phrynosoma blainvillii coast horned lizard	G4 S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,460 4,900	841 S:31	2	5	2	0	0	22	30	1	31	0	0
Plegadis chihi white-faced ibis	G5 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,425 1,492	20 S:2	1	0	0	0	0	1	2	0	2	0	0
Polioptila californica californica coastal California gnatcatcher	G4G5T3Q S2	Threatened None	CDFW_SSC-Species of Special Concern	750 2,954	1159 S:59	1	14	4	1	0	39	19	40	59	0	0
Progne subis purple martin	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	2,620 4,800	71 S:3	0	0	0	0	0	3	3	0	3	0	0
Pseudognaphalium leucocephalum white rabbit-tobacco	G4 S2	None None	Rare Plant Rank - 2B.2	1,600 1,900	62 S:2	0	0	0	0	0	2	2	0	2	0	0
Rana muscosa southern mountain yellow-legged frog	G1 S2	Endangered Endangered	CDFW_WL-Watch List IUCN_EN-Endangered USFS_S-Sensitive	1,700 7,000	213 S:6	1	0	0	0	4	1	5	1	2	4	0
Saltugilia latimeri Latimer's woodland-gilia	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture USFS_S-Sensitive	4,010 4,010	60 S:1	0	0	0	0	0	1	0	1	1	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Scutellaria bolanderi ssp. austromontana southern mountains skullcap	G4T3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	4,400 4,400	43 S:2	0	0	0	0	0	2	2	0	2	0	0
Setophaga petechia yellow warbler	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,445 2,473	78 S:4	0	0	1	0	0	3	0	4	4	0	0
Sidalcea neomexicana salt spring checkerbloom	G4 S2	None None	Rare Plant Rank - 2B.2 USFS_S-Sensitive	1,500 1,500	30 S:1	0	0	0	0	0	1	1	0	1	0	0
Socalchemmis icenoglei Icenogle's socalchemmis spider	G1 S1	None None		1,470 1,500	2 S:2	0	0	0	0	0	2	2	0	2	0	0
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	G4 S4	None None		1,760 4,000	246 S:27	1	0	0	0	2	24	27	0	25	0	2
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	G3 S3.2	None None		1,490 3,600	111 S:14	0	1	0	0	4	9	14	0	10	0	4
Southern Mixed Riparian Forest Southern Mixed Riparian Forest	G2 S2.1	None None		1,780 1,780	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Scrub Southern Riparian Scrub	G3 S3.2	None None		1,450 1,450	56 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	G4 S4	None None		2,800 2,800	230 S:1	0	0	0	0	0	1	1	0	1	0	0
Spea hammondii western spadefoot	G2G3 S3S4	Proposed Threatened None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	1,431 3,783	1456 S:51	1	16	4	4	1	25	19	32	50	1	0
Stenopelmatus cahuilaensis Coachella Valley jerusalem cricket	G1G2 S2	None None	IUCN_VU-Vulnerable	1,580 1,780	11 S:3	0	0	0	0	0	3	1	2	3	0	0

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California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Streptanthus bernardinus Laguna Mountains jewelflower	G3G4 S3S4	None None	Rare Plant Rank - 4.3 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	5,600 5,600	22 S:1	0	0	0	0	0	1	1	0	1	0	0
Streptocephalus woottoni Riverside fairy shrimp	G1G2 S2	Endangered None	IUCN_EN-Endangered	1,550 1,550	83 S:1	0	0	0	0	1	0	1	0	0	0	1
Symphyotrichum defoliatum San Bernardino aster	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_CRES-San Diego Zoo CRES Native Gene Seed Bank USFS_S-Sensitive	2,000 3,920	102 S:2	0	0	0	0	0	2	2	0	2	0	0
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,400 2,360	648 S:3	0	0	0	0	0	3	3	0	3	0	0
Tortula californica California screw moss	G2G3 S2?	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	2,100 2,450	15 S:2	0	2	0	0	0	0	0	2	2	0	0
Toxostoma lecontei Le Conte's thrasher	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,760 1,760	239 S:1	0	0	0	0	0	1	1	0	1	0	0
Trichocoronis wrightii var. wrightii Wright's trichocoronis	G4T3 S1	None None	Rare Plant Rank - 2B.1	1,420 1,420	12 S:1	0	0	0	0	0	1	1	0	1	0	0
Vireo bellii pusillus least Bell's vireo	G5T2 S3	Endangered Endangered		1,443 2,495	505 S:10	0	1	2	0	0	7	3	7	10	0	0
Xanthocephalus xanthocephalus yellow-headed blackbird	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	1,493 1,493	13 S:1	0	0	0	0	0	1	1	0	1	0	0
Xerospermophilus tereticaudus chlorus Palm Springs round-tailed ground squirrel	G5T2 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern	1,780 1,780	11 S:1	0	0	0	0	0	1	1	0	1	0	0

CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

Search Results

10 matches found. Click on scientific name for details

Search Criteria: , CRPR is one of [**1A:1B:2A:2B**] , Quad is one of [**3311668:3311678**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Abronia villosa var. *aurita*	chaparral sand-verbena	Nyctaginaceae	annual herb	(Jan)Mar-Sep	None	None	G5T2?	S2	1B.1		2001-01-01	 © 2011 Aaron E. Sims
Allium marvinii	Yucaipa onion	Alliaceae	perennial bulbiferous herb	Apr-May	None	None	G2	S2	1B.2	Yes	2001-01-01	 © 2013 Keir Morse
Astragalus pachypus var. *jaegeri*	Jaeger's milk-vetch	Fabaceae	perennial shrub	Dec-Jun	None	None	G4T1	S1	1B.1	Yes	1994-01-01	No Photo Available
Centromadia pungens ssp. *laevis*	smooth tarplant	Asteraceae	annual herb	Apr-Sep	None	None	G3G4T2	S2	1B.1	Yes	1994-01-01	No Photo Available
Chorizanthe parryi var. *parryi*	Parry's spineflower	Polygonaceae	annual herb	Apr-Jun	None	None	G3T2	S2	1B.1	Yes	1994-01-01	 © 2012 Keir Morse
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	Polygonaceae	annual herb	Apr-Jul	None	None	G5T3	S3	1B.2		1994-01-01	No Photo Available

Deinandra mohavensis	Mojave tarplant	Asteraceae	annual herb	(Jan-May)Jun-Oct	None	CE	G3	S3	1B.3	Yes	1974-01-01	No Photo Available
Dodecahema leptoceras	slender-horned spineflower	Polygonaceae	annual herb	Apr-Jun	FE	CE	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	None	None	G3	S3	2B.1		2006-12-26	 © 2020 Matt C. Berger
Pseudognaphalium leucocephalum	white rabbit-tobacco	Asteraceae	perennial herb	(Jul)Aug-Nov(Dec)	None	None	G4	S2	2B.2		2006-11-03	 © Anuja Parikh and Nathan Gale

Showing 1 to 10 of 10 entries

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Attachment 2: Site Photographs

Attachment 2

Site Photos



View looking northeast along entrance drive (New York Avenue) towards the Alessandro Ponds facility



View looking east at the parking lot towards the boundary fence, pump station, and Pond 1



View looking northeast at the entrance gate of Pond 1A and infrastructure



View looking east of Pond 1A; San Jacinto Mountains in the background



Pond 1A looking southwest along pond levee and boundary fence; nursery is adjacent to the right



View looking south of Pond 1, with Pond 3 beyond



View looking northeast of Pond 1, with Pond 1A to the left and San Jacinto River riparian vegetation in background



View looking northwest of Pond 1 with San Jacinto River levee on the right



View looking southeast of Pond 2 with red traffic bollard indicating gully erosion hazard



Area at levee of Pond 2 that has experienced gully erosion



View looking east inside Pond 2 with recent discing for vegetation control



View from Pond 2 looking northwest towards Pond 1 with boundary fence on right



View looking east at SE corner of Pond 2 with piping/pumping infrastructure and erosion



View looking southwest at Pond 3 towards W Ramona Expressway



View looking north at east corner of Pond 3 at dirt spoil pile

Attachment 3: Table of Special-status Species

Attachment 3

Table of Special-Status Species

Special-status Species Potential to Occur in the Study Area

Scientific Name	Common Name	Status*	General Habitat**	Microhabitat**	Potential to Occur in Study Area
Abronia villosa var. aurita	chaparral sand-verbena	1B.1	Chaparral, coastal scrub.	Sandy areas. 80-1600m.	Low. Patches of marginal habitat are present.
Actinemys pallida	Southwestern Pond Turtle	FPT	Ponds, streams, and other perennial water sources.	Basking areas must be available.	Low. Patches of marginal habitat are present.
Agelaius tricolor	tricolored blackbird	CSSC	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, & foraging area with insect prey within a few km of the colony.	Low. Patches of marginal habitat are present.
Allium marvinii	Yucaipa onion	1B.2	Chaparral.	In openings on clay soils. 760-1065 m.	None. Requisite habitat not present in Study Area.
Ambrosia pumila	San Diego Ambrosia	FE	Open, sun-exposed habitats in coastal sage scrub, chaparral, and grasslands.	Favors upper floodplains, vernal pool edges, and drainages with sandy loam or clay soils.	Low. Patches of marginal habitat are present.
Anaxyrus californicus	Arroyo toad	FE	Low-gradient streams with sandy, gravelly soils for breeding and adjacent, sparsely vegetated sandy terraces for burrowing.		None. Requisite habitat not present in Study Area.
Anniella stebbinsi	Southern California legless lizard	CSSC	Loose, friable soils, particularly sandy loam or fine sand, for burrowing, often found in coastal dunes, washes, and alluvial fans.		Low. Patches of marginal habitat are present.
Antrozous pallidus	pallid bat	CSSC	Deserts, grasslands, shrublands, woodlands & forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	None. Requisite habitat not present in Study Area.
Atriplex coronata var. notatior	San Jacinto Valley Crownscale	FE	Seasonally flooded, saline-sodic alkaline soils.	Requiring a dynamic hydrologic regime of winter saturation followed by spring drying for growth.	None. Requisite habitat not present in Study Area.
Aquila chrysaetos	golden eagle	CSSC	Rolling foothills, mountain areas, sage-juniper flats, & desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	None. Requisite habitat not present in Study Area.
Arizona elegans occidentalis	California glossy snake	CSSC	Arid to semi-arid habitats, primarily preferring open, sandy, or loamy soil areas for burrowing.		Low. Patches of marginal habitat are present.
Aspidoscelis hyperythra	orange-throated whiptail	CSSC	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats.	Prefers washes & other sandy areas with patches of brush & rocks. Perennial plants are necessary for its major food-termites.	Low. Patches of marginal habitat are present.
Astragalus pachypus var. jaegeri	Jaeger's milk-vetch	1B.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland.	Dry ridges and valleys and open sandy slopes; often in grassland and oak-chaparral. 365-915m.	Low. Patches of marginal habitat are present.
Athene cunicularia	burrowing owl	CSSC, CESA Candidate	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Low. Patches of marginal habitat are present.
Atriplex serenana var. davidsonii	Davidson's saltscale	CSSC	Coastal bluff scrub, coastal scrub.	Alkaline soil. 3-250m.	None. Requisite habitat not present in Study Area.
Bombus crotchii	Crotch's bumble bee	CSSC, CESA Candidate	Grasslands with nectar resources.		Low. Patches of marginal habitat are present.
Bombus pensylvanicus	American bumble bee	CSSC	Grasslands with nectar resources.		Low. Patches of marginal habitat are present.
Berberis nevinii	Nevin's Barberry	FE	Full sun, well-drained sandy or gravelly soils.	Washes, canyon floors, and slopes.	Low. Patches of marginal habitat are present.
Brodiaea filifolia	Thread-leaved Brodiaea	FT	Heavy clay soils, often within vernal pools, valley grasslands, and on gentle hillsides.		None. Requisite habitat not present in Study Area.
Branchinecta lynchi	Vernal Pool Fairy Shrimp	FT	Ephemeral, shallow, cool-water wetlands—primarily vernal pools, but also stock ponds and ditches.		None. Requisite habitat not present in Study Area.
Buteo regalis	ferruginous hawk	CSSC	Open grasslands, sagebrush flats, desert scrub, low foothills & fringes of pinyon-juniper habitats.	Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	None. Requisite habitat not present in Study Area.
Centromadia pungens ssp. laevis	smooth tarplant	1B.1	Valley and foothill grassland, chenopod scrub, meadows, playas, riparian woodland.	Alkali meadow, alkali scrub; also in disturbed places. 0-640 m.	None. Requisite habitat not present in Study Area.

Chaetodipus fallax fallax	northwestern San Diego pocket mouse	CSSC	Coastal scrub, chaparral, grasslands, sagebrush, etc. In western San Diego co.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	Low. Patches of marginal habitat are present.
Charina umbratica	southern rubber boa	CT	Restricted to the San Bernardino and San Jacinto mtns; found in a variety of montane forest habitats.	Found in vicinity of streams or wet meadows; requires loose, moist soil for burrowing; seeks cover in rotting logs.	None. Requisite habitat not present in Study Area.
Chorizanthe parryi var. parryi	Parry's spineflower	1B.1	Coastal scrub, chaparral.	Dry slopes and flats; sometimes at interface of 2 veg types, such as chap and oak woodland; dry, sandy soils. 40-1705m.	Low. Patches of marginal habitat are present.
Chorizanthe polygonoides var. longispina	long-spined spineflower	1B.2	Open, sunny, and often clay-based soils, typically in coastal sage scrub, chaparral, and vernal pool margins.		None. Requisite habitat not present in Study Area.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT, CE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, w/ lower story of blackberry, nettles, or wild grape.	None. Requisite habitat not present in Study Area.
Corynorhinus townsendii	Townsend's big-eared bat	CSSC	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	None. Requisite habitat not present in Study Area.
Crotalus ruber	red-diamond rattlesnake	CSSC	Chaparral, woodland, grassland, & desert areas from coastal San Diego county to the eastern slopes of the mountains.	Occurs in rocky areas & dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	Low. Patches of marginal habitat are present.
Danaus plexippus	Monarch butterfly	FPT	Grasslands that provide milkweed (Asclepias spp.) For larvae, diverse nectar sources for adults, and specific, sheltered microclimates for overwintering.		Low. Patches of marginal habitat are present.
Deinandra mohavensis	Mojave tarplant	CE	Riparian scrub, chaparral.	Low sand bars in river bed; mostly in riparian areas or in ephemeral grassy areas. 850-1600m.	None. Requisite habitat not present in Study Area.
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, CE	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	Needs early to intermediate seral stages.	Low. Patches of marginal habitat are present.
Dipodomys stephensi	Stephens' kangaroo rat	FT, CT	Primarily annual & perennial grasslands, but also occurs in coastal scrub & sagebrush with sparse canopy cover.	Prefers buckwheat, chamise, brome grass & filaree. Will burrow into firm soil.	Low. Patches of marginal habitat are present.
Dodecahema leptoceras	slender-horned spineflower	FE, 1B.1	Open, sparsely vegetated areas on stable, 100+ year-old stream terraces, washes, and floodplains.	Generally at elevations between 656 and 2,296 feet.	Low. Patches of marginal habitat are present.
Empidonax traillii extimus	Southwestern Willow Flycatcher	FE	Dense, riparian shrub and tree communities for nesting.	Typically located near surface water, saturated soil, or within areas with high humidity (microclimates).	None. Requisite habitat not present in Study Area.
Imperata brevifolia	California satintail	2B.1	Coastal scrub, chaparral, riparian scrub, Mojavean scrub, meadows and seeps (alkali).	Mesic sites, alkali seeps, riparian areas. 0-500m.	None. Requisite habitat not present in Study Area.
Lanius ludovicianus	loggerhead shrike	CSSC	Broken woodlands, savannah, pinyon-juniper, joshua tree, & riparian woodlands, desert oases, scrub & washes.	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Low. Patches of marginal habitat are present.
Lasiurus xanthinus	western yellow bat	CSSC	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	Roosts in trees, particularly palms. Forages over water and among trees.	None. Requisite habitat not present in Study Area.
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	1B.1	Coastal salt marshes, playas, valley and foothill grassland, vernal pools.	Usually found on alkaline soils in playas, sinks, and grasslands. 1-1400m.	None. Requisite habitat not present in Study Area.
Navarretia fossalis	Spreading Navarretia	FT	Ephemeral wetlands, specifically vernal pools, alkali playas, and shallow freshwater marshes.		None. Requisite habitat not present in Study Area.
Neotoma lepida intermedia	San Diego desert woodrat	CSSC	Coastal scrub of southern California from San Diego county to San Luis obispo county.	Moderate to dense canopies preferred. They are particularly abundant in rock outcrops & rocky cliffs & slopes.	Low. Patches of marginal habitat are present.
Onychomys torridus ramona	southern grasshopper mouse	CSSC	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover.	Feeds almost exclusively on arthropods, especially scorpions & orthopteran insects.	Low. Patches of marginal habitat are present.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	CSSC	Lower elevation grasslands & coastal sage communities in and around the Los Angeles basin.	Open ground with fine sandy soils. May not dig extensive burrows, hiding under weeds & dead leaves instead.	Low. Patches of marginal habitat are present.
Phrynosoma blainvillii	coast horned lizard	CSSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	Open areas for sunning, bushes for cover, patches of loose soil for burial, & abundant supply of ants & other insects.	Low. Patches of marginal habitat are present.
Plegadis chihi	white-faced ibis	CSSC	Shallow fresh-water marsh.	Dense tule thickets for nesting interspersed with areas of shallow water for foraging.	None. Requisite habitat not present in Study Area.
Polioptila californica californica	Coastal California Gnatcatcher	FT	Obligate resident of low-elevation, arid coastal sage scrub communities in Southern California and Baja California.	Low, dense shrubs—primarily California sagebrush and buckwheat.	None. Requisite habitat not present in Study Area.
Pseudognaphalium leucocephalum	white rabbit-tobacco	2B.2	Riparian woodland, cismontane woodland, coastal scrub, chaparral.	Sandy, gravelly sites. 0-2100m.	Low. Patches of marginal habitat are present.

Setophaga petechia	yellow warbler	CSSC	Moist, shrubby habitats, particularly riparian areas (willows, alders, cottonwoods), wet thickets, and forest edges.		None. Requisite habitat not present in Study Area.
Sidalcea neomexicana	salt spring checkerbloom	2B.2	Alkali playas, brackish marshes, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub.	Alkali springs and marshes. 0-1500m.	None. Requisite habitat not present in Study Area.
Spea hammondii	western spadefoot	FPT	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands.	Vernal pools are essential for breeding and egg-laying.	None. Requisite habitat not present in Study Area.
Streptocephalus woottoni	Riverside Fairy Shrimp	FE	Deep vernal pools lacking significant vegetation.		None. Requisite habitat not present in Study Area.
Taxidea taxus	American badger	CSSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Low. Patches of marginal habitat are present.
Vireo bellii pusillus	least Bell's vireo	FE, CE	Summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft.	Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, baccharis, mesquite.	None. Requisite habitat not present in Study Area.
Xanthocephalus xanthocephalus	yellow-headed blackbird	CSSC	Nests in freshwater emergent wetlands with dense vegetation & deep water. Often along borders of lakes or ponds.	Nests only where large insects such as odonata are abundant, nesting timed with maximum emergence of aquatic insects.	None. Requisite habitat not present in Study Area.

Source: Data compiled from CNDDB GIS Spatial Data, IPaC (Attachment 1), CNPS (Attachment 1). The CNDDB 9-quad has additional species which were reviewed for their potential to occur which do not appear in this table; however, the Study Area does not have natural/suitable habitat for these species.

*Definitions of Status Codes: FE = Federally listed as endangered; FT = Federally listed as threatened; FPT = Federally proposed threatened, FC = Candidate for Federal listing; CE = California State listed as endangered; CT = California State listed as threatened; CSSC = California species of special concern; CRPR (California Rare Plant Rank) List 1A = Plants presumed extinct in California by; CRPR List 1B = Plants designated rare, threatened or endangered in California and elsewhere; CRPR List 2A = Plants presumed extirpated in California but common elsewhere; CRPR 2B = Plants rare threatened or endangered in California, but more common elsewhere; CRPR 3 Review List: Plants about which more information is needed. CRPR Threat Ranks: 0.1 = seriously threatened in California; 0.2 = moderately threatened in California; 0.3 = not very threatened in California.

**Summarized from CNDDB, unless otherwise noted.

Appendix D

Cultural Resources Inventory

Confidential Cultural Resources Study is Bound Separately*

*The Cultural Resources Study has been bound separately to protect potentially sensitive information about the location and nature of cultural resources.

Appendix E

Acoustical Analysis Report

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Acoustical Analysis Report for EMWD Alessandro Ponds Optimization Phase II Project

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July 7, 2026

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Appendices

A. Project Plans
B. Applicable Noise Regulations
C. CadnaA Analysis Data and Results

1.0 Executive Summary

The proposed project, Eastern Municipal Water District (EMWD) Alessandro Ponds Optimization Phase II Project, consists of improvements to an existing recycled water storage facility located near the intersection of West Ramona Expressway and Alessandro Avenue North in the City of San Jacinto and unincorporated Riverside County, California.

EMWD, as a public agency, is not subject to other jurisdictional agencies' established noise standards. However, EMWD follows a "good neighbor" approach to adhering to local noise standards. The noise standards of the Federal Transit Administration (FTA), the City of San Jacinto, and the County of Riverside are used for the purposes of evaluating the significance of the proposed Project's noise levels for the purposes of this analysis under CEQA.

Noise impacts from construction equipment were evaluated to determine if the construction noise levels would meet the FTA construction noise limit of 80 dBA. With operating hours being limited to those allowable in the City of San Jacinto and County of Riverside and standard good practice construction noise control measures being followed, temporary construction noise and vibration are expected to be less than significant at sensitive receptor locations.

Additionally, truck haul route and vendor trip noise impacts were evaluated to determine whether noise from the soil export haul routes and vendor trips would be significant. A significant direct impact occurs when project traffic combines with existing traffic and causes a doubling of sound energy, which is an increase of 3 dB. As detailed in Section 5.2 herein, the noise level increase from project-generated truck haul routes and vendor trips is expected to be less than 3 dB. For this reason, project-generated traffic noise levels are expected to be less than significant.

The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.3.

2.0 Introduction

EMWD, as a public agency, is not subject to other jurisdictional agencies' established noise standards. However, as EMWD follows a "good neighbor" approach to adhering to local noise standards, this acoustical analysis report is submitted to satisfy the noise requirements of the City of San Jacinto, County of Riverside, and State of California. Its purpose is to assess potential project-related noise sources, such as temporary construction noise and related truck traffic. This analysis aims to determine if additional project design features are necessary and feasible to reduce these impacts to comply with the applicable noise regulations of the City of San Jacinto, County of Riverside, and State of California. Potential impacts have also been assessed for significance per the California Environmental Quality Act (CEQA).

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ} for a specified duration. Unless a different time period is specified, L_{EQ} is implied to mean a period of one hour. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances.

2.1 Project Description

The proposed project, Eastern Municipal Water District (EMWD) Alessandro Ponds Optimization Phase II Project, consists of improvements to an existing recycled water storage facility. The proposed project would increase the water storage capacity of three ponds through deepening, expansion, and raising of the berms. The berms, which are currently subject to erosion, would also be stabilized with the addition of a soil cement surface. Construction activity is proposed to include the export of approximately 120,400 cubic yards of soil off site. For additional project details, please refer to the project plans provided in Appendix A.

2.2 Project Location

The proposed project is located on 35.75 acres, partially in the City of San Jacinto and partially in an unincorporated area of Riverside County, California. The Assessor's Parcel Numbers (APNs) for the site are 433-070-018, 433-070-019, 433-070-020, 433-070-021, and 433-070-031. For a graphical representation of the site, please refer to the Vicinity Map, Assessor's Parcel Map, and Satellite Aerial Photograph, provided as Figures 1 through 3, respectively.

2.3 Applicable Noise Regulations

The project site is located partially in the City of San Jacinto and partially in an unincorporated area of Riverside County. EMWD, as a public agency, is not subject to other jurisdictional agencies' established noise standards. Likewise, as a public agency, EMWD is not subject to City or County of Riverside ordinances and would not be required to obtain variances. EMWD has not established an applicable noise standard of its own for permanent or temporary noise levels. However, EMWD follows a "good neighbor" approach to adhering to local noise standards. The noise standards of the Federal Transit Administration (FTA), the City of San Jacinto, and the County of Riverside are used for the purposes of evaluating the significance of the proposed Project's noise levels for the purposes of this analysis under CEQA.

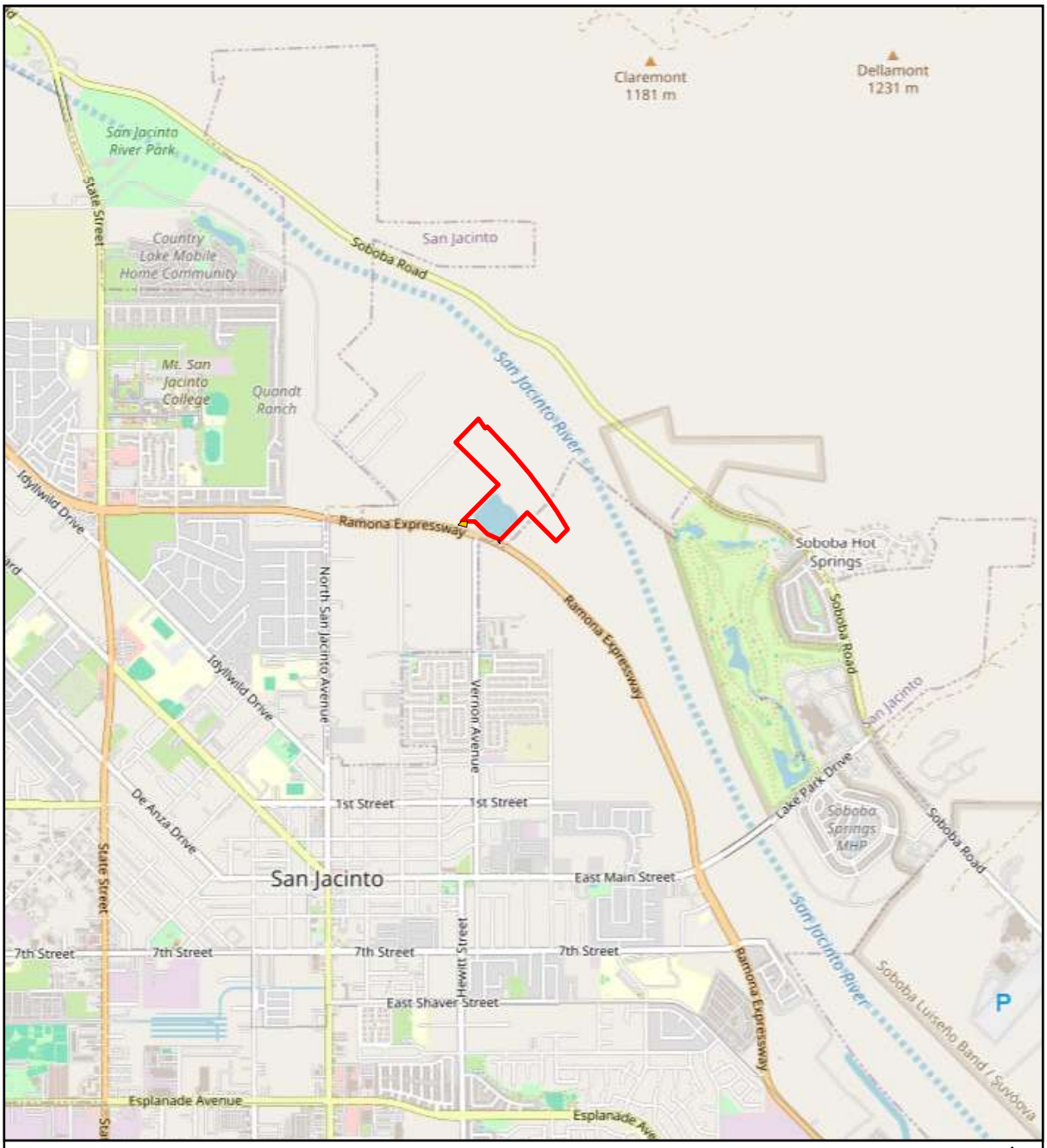
The City of San Jacinto regulates construction noise by limiting the allowable hours of operation. According to the City of San Jacinto Municipal Code Chapter 8.40, noise from construction activity is exempt from quantitative noise limits, provided that construction activity is limited to the hours of 7 a.m. and 7 p.m. on Monday through Saturday and between the hours of 9 a.m. and 6 p.m. on Sundays and holidays.

Similarly, Section 2i of Riverside County Ordinance 847 allows private construction projects located within one quarter mile (0.25 miles) of inhabited dwellings to be exempt from County noise standards, provided that construction is limited to occur between the hours of 6 a.m. and 6 p.m. during the months of June through September, and between the hours of 6 p.m. and 7 a.m. during the months of October through May.

Considering the strictest allowable hours of operation of construction equipment in both the City of San Jacinto and the County of Riverside, construction equipment operation for the proposed project is limited to occur between the hours of 7 a.m. and 6 p.m. on Monday through Saturday and between the hours of 9 a.m. and 6 p.m. on Sundays and holidays.

As detailed above, noise from construction activities is exempt from meeting the quantitative noise ordinance limits; however, according to the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (see reference), a typically acceptable threshold for temporary construction noise impacts is an hourly average noise level of 80 dBA L_{EQ} at surrounding residential properties, during daytime hours. These daytime noise limits were applied for this project, as the City of San Jacinto and County of Riverside prohibit construction during nighttime hours.

Pertinent sections of the City of San Jacinto Municipal Code and Riverside County Ordinance 847 are provided as Appendix B.



Source: Open Street Map, 2026

N

Project Location

Potential Construction Access Easement Area

Temporary Construction Access

Figure 1.

Vicinity Map



Source: Riverside County Map My County, 2026

Project Location

Potential Construction Access Easement Area

Temporary Construction Access

Figure 2.

Assessor's Parcel Map



Source: Google Earth Pro, 2026

N

Noise Measurement Location

Project Location

Potential Construction Access Easement Area

Temporary Construction Access

Figure 3.

Satellite Aerial Photograph

3.0 Environmental Setting

3.1 Existing Noise Environment

3.1.1 Roadway Traffic Sources

The primary noise sources in the vicinity of the project site include automobile and truck traffic noise from surrounding roadways. No other noise source is considered significant. The current traffic volumes for surrounding roadways were provided by the San Jacinto General Plan Update (GPU) Transportation Impact Analysis (see reference), which was published in 2022 and is based on traffic counts completed in 2019.

Ramona Expressway (SR-79 between Sanderson Avenue and State Street) is a two-to-six-lane, two-way roadway running generally east-west along the southern boundary of the project site. The posted speed limit is between 50 and 65 mph. According to the San Jacinto GPU Transportation Impact Analysis, Ramona Expressway carries a current (year 2019) traffic volume of approximately 22,629 Average Daily Trips (ADT) west of Warren Road, 24,155 ADT between Warren Road and Sanderson Avenue (also assumed between Sanderson Avenue and Lyon Avenue), 27,017 ADT between Lyon Avenue and State Street, 23,861 ADT between State Street and Esplanade Avenue, and 18,706 ADT south of Esplanade Avenue.

Warren Road is a two-to-three-lane, two-way roadway running north/south to the west of the project site. The posted speed limit is 55. According to the San Jacinto GPU Transportation Impact Analysis, Warren Road carries a current (year 2019) traffic volume of approximately 11,778 ADT and 13,891 ADT north and south of Esplanade Avenue, respectively.

Lake Park Drive is a four-lane, two-way roadway running generally northeast/southwest to the east of the project site. The posted speed limit is 50. According to the San Jacinto GPU Transportation Impact Analysis, Lake Park Drive carries a current (year 2019) traffic volume of approximately 12,250 ADT.

According to Caltrans (see reference), SR-79 currently carries a truck percentage mix of 5.3% medium and 3.2% heavy trucks; this truck percentage mix was applied for all of Ramona Expressway. No truck percentages were available for Warren Road or Lake Park Drive; however, based on neighboring and surrounding land use, roadway classification, professional experience, and on-site observations, a truck percentage mix of 3.0% medium and 2.0% heavy trucks was used for Warren Road and Lake Park Drive.

Traffic volumes for the roadway sections near the project site are shown in Table 1. For further roadway details and projected future ADT traffic volumes, please refer to Appendix C: CadnaA Analysis Data and Results.

Table 1. Overall Roadway Traffic Information

Roadway Name (Section)	Speed Limit (mph)[1]	Vehicle Mix (%)[2]		Current ADT (2019)[3]
		Medium Trucks	Heavy Trucks	
Ramona Expressway (west of Warren Road)	55	5.3	3.2	22,629
Ramona Expressway (between Warren Road and Lyon Avenue)	65	5.3	3.2	24,155
Ramona Expressway (between Lyon Avenue and State Street)	55	5.3	3.2	27,017

Table 1. Overall Roadway Traffic Information				
Roadway Name (Section)	**Speed Limit (mph)[1]**	**Vehicle Mix (%)[2]**		**Current ADT (2019)[3]**
		Medium Trucks	**Heavy Trucks**	
Ramona Expressway (between State Street and Esplanade Avenue)	55	5.3	3.2	23,861
Ramona Expressway (south of Esplanade Avenue)	50	5.3	3.2	18,706
Warren Road (north of Esplanade Avenue)	55	3.0	2.0	11,778
Warren Road (south of Esplanade Avenue)	55	3.0	2.0	13,891
Lake Park Drive	50	3.0	2.0	12,250

[1]Applicable speed limits for each roadway were determined based on posted signs in the vicinity of the roadway section.
[2]The truck percentage mix for Ramona Expressway was provided by Caltrans. No truck percentages were available for Warren Road or Lake Park Drive; therefore, the vehicle mixes for Warren Road and Lake Park Drive were determined based on neighboring and surrounding land use, roadway classification, professional experience, and on-site observations.
[3]The current traffic volumes for surrounding roadways were provided by the San Jacinto General Plan Update (GPU) Transportation Impact Analysis (see reference), which was published in 2022 and is based on traffic counts completed in 2019.

3.1.2 Measured Noise Level

An on-site inspection and long-term noise measurements were made beginning the morning of Thursday, April 30, 2026 and running through the morning of May 1, 2026. The purpose of these measurements was to obtain information regarding existing ambient noise levels in residential areas near the project site, as surrounding residential areas are the nearest noise-sensitive receivers. The noise measurement performed is expected to be representative of the typical noise exposure on site and encompasses the primary sources of noise in the vicinity of the project, which was observed to be traffic on surrounding roadways.

Long-term noise measurements were taken at two locations. One meter (NML1) was placed near the off-site residential properties along West Ramona Expressway, at approximately 121 feet south of the Ramona Expressway centerline and approximately 31 feet east of the North San Jacinto Avenue centerline. The second meter (NML2) was placed near the off-site residential properties along Lake Park Drive, at approximately 44 feet southeast of the Lake Park Drive centerline and approximately 371 feet southwest of the Soboba Springs Drive centerline. NML1 was placed at a height of approximately 3 feet above ground level, where it was placed in a tree for security purposes; NML2 meter was placed at a height of approximately 3.5 feet above ground level, where it was placed in a bush for security purposes. Noise data obtained on site is shown in Table 2, and the measurement locations are shown graphically in Figure 3.

Table 2. Measured Noise Levels on Site			
Date	**Time**	**Hourly Average Noise Level (dBA)**	
		NML1	**NML2**
April 30, 2026	9 a.m. – 10 a.m.	65.7	76.1
	10 a.m. – 11 a.m.	65.4	75.4
	11 a.m. – 12 p.m.	65.6	75.1
	12 p.m. – 1 p.m.	65.5	75.1
	1 p.m. – 2 p.m.	65.7	74.9
	2 p.m. – 3 p.m.	66.2	75.8
	3 p.m. – 4 p.m.	69.5	79.5
	4 p.m. – 5 p.m.	68.4	77.5
	5 p.m. – 6 p.m.	69.1	76.6
	6 p.m. – 7 p.m.	67.8	76.2
	7 p.m. – 8 p.m.	72.1	76.1
	8 p.m. – 9 p.m.	67.1	77.2
	9 p.m. – 10 p.m.	68.5	75.9
	10 p.m. – 11 p.m.	64.3	75.8
	11 p.m. – 12 a.m.	64.9	73.7
May 1, 2026	12 a.m. – 1 a.m.	63.3	72.3
	1 a.m. – 2 a.m.	63.4	71.6
	2 a.m. – 3 a.m.	62.0	71.8
	3 a.m. – 4 a.m.	63.2	72.5
	4 a.m. – 5 a.m.	68.1	74.0
	5 a.m. – 6 a.m.	67.1	76.3
	6 a.m. – 7 a.m.	69.1	77.0
	7 a.m. – 8 a.m.	69.7	77.4
	8 a.m. – 9 a.m.	68.6	77.0

At NML1, measured noise levels were observed to range from a minimum of 62.0 dBA between the hours of 2 a.m. and 3 a.m. on May 1, 2026 to a maximum of 72.1 dBA between 7 p.m. and 8 p.m. on April 30, 2026. At NML2, measured noise levels were observed to range from a minimum of 71.6 dBA between the hours of 1 a.m. and 2 a.m. on May 1, 2026 to a maximum of 79.5 dBA between 3 p.m. and 4 p.m. on April 30, 2026.

3.1.3 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1.1. The calculated noise levels (L_{EQ}) were compared with the measured traffic noise level to determine if adjustments or corrections (calibration) should be applied to the traffic noise prediction model. Adjustments are intended to account for site-specific differences, such as reflection and absorption, which may be greater or lesser than accounted for in the model.

The measured noise level of 65.4 dBA L_{EQ} between 10 a.m. and 11 a.m. at NML1 (at approximately 121 feet south of the Ramona Expressway centerline and approximately 31 feet east of the North San Jacinto Avenue centerline) was compared to the calculated (modeled) noise level of 64.2 dBA L_{EQ} for the same anticipated traffic flow. The measured noise level of 65.4 dBA L_{EQ} between 10 a.m. and 11 a.m. at NML1 was used for a worst-case analysis, as it was the lowest measured noise level during allowable hours of construction activity. According to the Federal Highway Administration's Highway Traffic Noise: Analysis and Abatement Guide (see reference), a traffic noise model is considered validated if the measured and calculated noise impacts differ by three decibels or less. No adjustment was deemed necessary to model future noise levels for this location as the difference between the measured and calculated levels was found to be less than three decibels. The traffic noise model is assumed to be representative of actual traffic noise that is experienced on site. This information is shown in Table 3. Please refer to Appendix C for additional information.

Table 3. Calculated versus Measured Traffic Noise Data

Location	Calculated	Measured	Difference	Correction
121' south of Ramona Expy. centerline and 31' east of N. San Jacinto Ave. centerline	64.2 dBA L_{EQ}	65.4 dBA L_{EQ}	1.2 dB	None Applied

3.2 Future Noise Environment

3.2.1 On-Site Construction Equipment

During permissible hours of operation, the construction noise is exempt from the quantitative noise limits of the City of San Jacinto and County of Riverside. However, noise impacts from construction equipment were evaluated to determine if the construction noise levels would meet the generally accepted construction noise limit of 80 dBA. Based on communication with the project proponent and professional experience, the site construction will consist of pond deepening and soil export, berm raising and stabilization, and pipeline replacement.

The equipment listed in Table 4 is typical of what is expected to be used on site based on the information provided by the project proponent and professional experience. Construction equipment noise levels were obtained from the Department for Environment, Food & Rural Affairs (DEFRA), which compare well with noise measurement results of construction equipment performed by Eilar Associates for other similar projects. Information on the anticipated equipment duty cycles was obtained from the Federal Highway Administration (see references).

Table 4. Anticipated Construction Activity and Equipment Noise Levels			
Equipment	**Duty Cycle (%)[1]**	**Noise Level at 50 feet (dBA)[2]**	**Quantity**
Backhoe/Loader	40	75	2
Dozer	40	76	2
Drill Rig	50	79	1
Dump Truck[3]	40	77	5
Excavator	40	78	2
Grader	40	82	1
Pick-Up Truck[4]	40	72	3
Pump	50	74	1
Roller	20	76	1
Scraper[5]	40	82	3
Soil Cement Batch Plant[6]	15	83	1
Utility Truck[4]	40	72	1
Water Truck	40	75	1

[1]Duty cycle information was provided by the Federal Highway Administration.
[2]With the exception of the soil cement batch plant, noise level information was provided by UK Department for Environment, Food and Rural Affairs. The noise level at 50 feet was calculated using simple distance attenuation based on the reference levels obtained from DEFRA which are given at a distance of 10 meters (approximately 32.8 feet).
[3]As detailed in Section 3.2.2 below, a worst-case average of approximately 5 dump truck trips per hour is expected for soil export. The dump trucks were also evaluated as being on-site.
[4]Noise levels for a pick-up truck or a utility truck were not available to the undersigned; therefore, noise levels from a flatbed truck were applied to the pick-up truck and utility trucks.
[5]Noise levels for a scraper were not available to the undersigned; therefore, noise levels from the grader were applied to the scraper equipment. Two or three scrapers are expected to be on site at a given time; for a worst-case analysis, calculations consider three scrapers.
[6]Noise level information was provided by the Federal Highway Administration.

3.2.2 Soil Export Haul Routes and Vendor Trips

According to the project proponent, excavation of the ponds would require the export of approximately 120,400 cubic yards of soil. The soil may be hauled by truck to one or more construction sites for use as fill. While no specific construction sites are identified at this point, it is expected that numerous sites would be available within 20 miles of the project site. It is expected that the haul trucks would primarily use designated truck routes. If no construction sites are available to accept the soil, the soil would be hauled to the Lamb Canyon Landfill (north of San Jacinto) via Ramona Expressway and North Sanderson Avenue. According to the project proponent, anticipated haul routes include the following roadways: Ramona Expressway, North Sanderson Avenue (north of Ramona Expressway), Warren Road, and Lake Park Drive.

Excavation and export of soil could occur over an 18-month period. Soil export is expected to generate an average of approximately 20 round trips per day, which equates to approximately 40 one-way trips per day, or a worst-case average of approximately 5 soil export trips per hour during workdays.

Additionally, vendor trips were considered to ensure that traffic noise impacts from vendors do not have a significant noise impact. It is expected that there will be approximately 5 round trips per day from vendors, which equates to approximately 10 one-way trips per day from vendors. For a worst-case scenario, it was assumed that there would be 2 vendor trips per hour during workdays.

Considering the soil export haul routes and vendor trips, it was assumed that there would be a combined project-generated traffic volume of 7 heavy trucks per hour. Please refer to Section 5.2 for additional details.

4.0 Methodology and Equipment

4.1 Methodology

4.1.1 Roadway Noise Calculation

The Traffic Noise Model (TNM) calculation protocol in CadnaA Version 2026 MR 1 (based on the methodology used in TNM Version 2.5, released in February 2004 by the U.S. Department of Transportation) was used for all traffic modeling in the preparation of this report. Using the TNM protocol, the average ambient traffic noise is calculated as 6.9% of the ADT for surrounding roadways, based on daily percentages of hourly traffic levels established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference), which accounts for the applicable hours of construction (7 a.m. to 6 p.m.). Noise attenuation methods may be analyzed, tested, and planned with TNM, as required.

In order to determine the estimated traffic volumes of roadways during the traffic noise measurement made on site for model calibration, the approximate percentage of the Average Daily Trips (ADT) value for the time period in which the measurement is made is incorporated into the traffic model. These percentages have been established in a study performed by Katz-Okitsu and Associates, Traffic Engineers (see reference). For purposes of calibrating the CadnaA TNM, 5.3% of the ADT values for the current environment were used in calculations (for roadways that were not manually counted) to account for traffic between the hours of 10 a.m. and 11 a.m. in the vicinity of the project site.

4.1.2 CadnaA Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using CadnaA Version 2026 MR 1, which is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA (Computer Aided Noise Abatement) assists in the calculation, presentation, assessment, and alleviation of noise exposure. It allows for the input of project information such as noise source data, barriers, structures, and topography to create a detailed model and uses the most up-to-date calculation standards to predict outdoor noise impacts. Noise standards used by CadnaA that are particularly relevant to this analysis include ISO 9613-2 (Attenuation of sound during propagation outdoors). CadnaA provides results that are in line with basic acoustical calculations for distance attenuation and barrier insertion loss.

4.1.3 Formulas and Calculations

Construction vibration impact calculations were conducted using formulas recommended by the Federal Transit Authority *Transit Noise and Vibration Assessment Manual* (see reference). Section 7.2 of this document provides the following equations for determining vibration impacts at a specified distance:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.1}$$

where PPV_{equip} is the peak particle velocity (in inches per second) of the equipment, adjusted for distance, PPV_{ref} is the reference vibration level (in inches per second) at a distance of 25 feet from the equipment, and D is the distance from the equipment to the receiver.

4.2 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing noise levels:

- Soft dB Model Piccolo II Type 2 Sound Level Meter, Serial # P0220110906 and P0224100304
- Larson Davis Model CAL200 Type 1 Calibrator, Serial # 19178

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward to ensure accuracy. All sound level measurements presented in this report, in accordance with the regulations, were conducted using a sound level meter that conforms to the American National Standards Institute specifications for sound level meters (ANSI S1.4). All instruments are maintained with National Institute of Standards and Technology (NIST) traceable calibration, per the manufacturers' standards.

5.0 Noise Impacts

5.1 Temporary On-Site Construction Noise Impacts

The City of San Jacinto and County of Riverside regulate construction noise by limiting the allowable hours of operation. As detailed in Section 2.3 herein, considering the strictest allowable hours of operation of construction equipment in both the City of San Jacinto and the County of Riverside, construction equipment operation for the proposed project is limited to occur between the hours of 7 a.m. and 6 p.m. on Monday through Saturday and between the hours of 9 a.m. and 6 p.m. on Sundays and holidays. Though the City of San Jacinto and County of Riverside do not give a quantitative noise limit for construction noise, the FTA noise limit of 80 dBA L_{EQ} or less at surrounding noise-sensitive receivers was applied for this project for a worst-case analysis.

Construction noise levels were calculated using the information detailed in Section 3.2.1 at the nearest sensitive receivers (nearest surrounding residential receivers and school) to the west and south of the project site. Construction noise was calculated using CadnaA, where equipment was evaluated as an area source, to account for the average equipment location as it moves around on site; as the soil cement batch plant is not expected to move, it was evaluated as a point source. The location of the soil cement batch plant is currently unknown; therefore, the soil cement batch plant was assumed to be located at the southwest corner of the project site, which is located closest to sensitive receivers, for a worst-case analysis. Any other potentially noise-sensitive receivers are located at a greater distance from construction activity and therefore would be exposed to lesser noise impacts due to distance attenuation and shielding provided by intervening structures. Additionally, noise calculations consider typical duty cycles of equipment, to account for periods of activity and inactivity on the site. Though construction activity is expected to be carried out in phases, all of the equipment was evaluated as being on-site simultaneously, for a worst-case analysis. Noise levels for construction activity are shown in

Table 5. Detailed calculations are provided in Appendix C, and a graphical representation of construction noise source and receiver locations is provided as Figure 4.

Table 5. Temporary Construction Noise Levels at Nearest Sensitive Receivers

Receiver	Location	Noise Limit (dBA)[1]	Noise Level (dBA)
R1	21848 Olmstead Street (Residential)	80	54.8
R2	40393 Bergin Street (Residential)	80	53.0
R3	22145 Alessandro Avenue North (Residential)	80	51.3
R4	22384 Alessandro Avenue North (Residential)	80	49.9
R5	600 North Vernon Avenue (School)	80	52.2

[1]Though the City of San Jacinto and County of Riverside do not give a quantitative noise limit for construction noise, the FTA noise limit of 80 dBA L_{EQ} or less at surrounding noise-sensitive receivers was applied for this project for a worst-case analysis.

As shown above, construction noise levels are not expected to exceed the typically acceptable construction noise threshold of 80 dBA L_{EQ}. Any other surrounding receivers are located at a greater distance from proposed construction activity and therefore will be exposed to lesser noise impacts due to additional distance attenuation and shielding provided by intervening structures.

While noise impacts are expected to remain in compliance with typically accepted construction noise limits, the following best management practices would be implemented to further reduce noise impacts.

1. Construction activities would comply with the applicable construction hours identified within the City of San Jacinto Development Code, Section 8.40.090, and County of Riverside Ordinance 847 and would only occur during daytime hours between 7:00 a.m. and 5:00 p.m. on weekdays.

2. Stationary noise-generating equipment shall be located as far from sensitive receptors as possible. Such equipment shall also be oriented to minimize noise that would be directed toward sensitive receptors. Whenever possible, other non-noise generating equipment (e.g., roll-off dumpsters) shall be positioned between the noise source and sensitive receptors. The nearest sensitive receptors are listed in Table 5 and shown graphically in Figure 4.

3. Equipment and staging areas shall be located as far from sensitive receptors as possible. At the staging location, equipment and materials shall be kept as far from adjacent sensitive receptors as possible. The nearest sensitive receptors are listed in Table 5 and shown graphically in Figure 4.

4. Construction vehicles and equipment shall be maintained in the best possible working order; operated by an experienced, trained operator; and shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds).

5. Unnecessary idling of internal combustion engines shall be prohibited. In practice, this would require turning off equipment if it would idle for five or more minutes.

6. Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.

7. The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

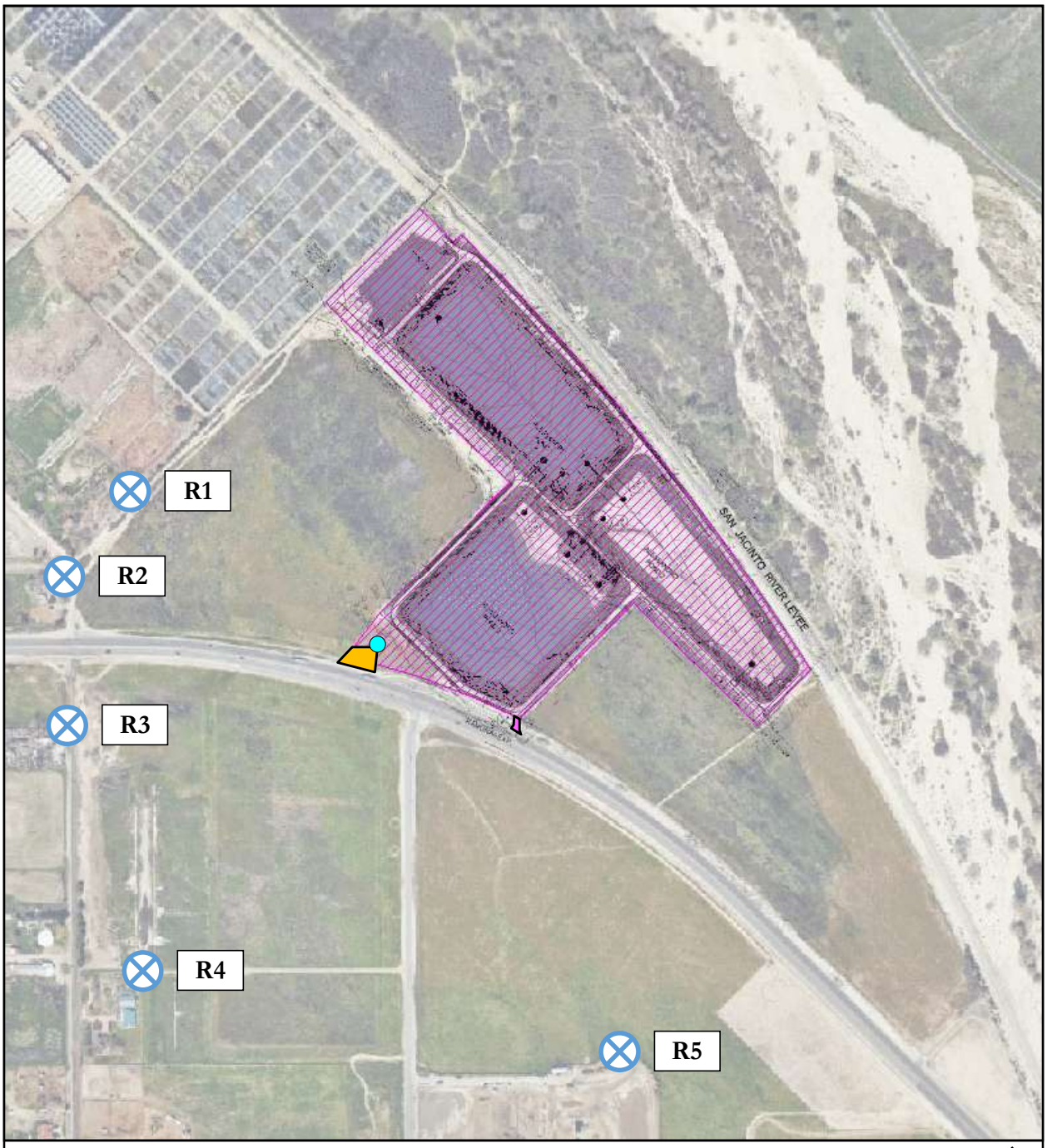
With operating hours limited to those permitted by the City of San Jacinto and County of Riverside, and adherence to the general good practice construction noise control techniques, temporary construction noise impacts are expected to be less than significant at surrounding properties.

5.2 Soil Export Haul Route and Vendor Trip Impacts

As detailed in Section 3.2.2, project-generated truck haul route impacts were evaluated to determine whether noise impacts from the soil export haul routes and vendor trips would be significant. Calculations were performed using CadnaA to determine the approximate change in noise levels as a result of project-generated truck traffic. A significant direct impact occurs when project traffic combines with existing traffic and causes a doubling of sound energy, which is an increase of 3 dB. Project-generated truck traffic noise increases are shown in Table 6. Detailed calculations are provided in Appendix C, and a graphical representation of receiver locations and haul routes is provided as Figure 5.

Table 6. Anticipated Traffic Noise Level Increase due to Soil Export Haul Routes and Vendor Trips

Receiver	Location	Noise Level (dBA)		
		Ambient	Ambient + Project	Increase
R6	361 Cantata Avenue, Hemet	62.0	62.3	0.3
R7	5788 Arrowstone Lane, Hemet	59.0	59.4	0.4
R8	3440 Cottonwood Avenue, San Jacinto	71.4	71.7	0.3
R9	312 N Warren Road, San Jacinto	69.7	70.1	0.4
R10	1953 N Warren Road, San Jacinto	71.0	71.4	0.4
R11	35500 Ramona Expressway, San Jacinto	72.3	72.5	0.2
R12	36620 Ramona Expressway, San Jacinto	72.3	72.5	0.2
R13	1811 Stream Pointe, San Jacinto	66.5	66.6	0.1
R14	1000 Serena Drive, San Jacinto	72.0	72.1	0.1
R15	874 Acorn Drive, San Jacinto	71.6	71.7	0.1
R16	5100 Pleasant Hill Road, San Jacinto	71.5	71.7	0.2
R17	2314 Lake Park Drive, San Jacinto	66.7	67.1	0.4
R18	1499 Old Mountain Ave, San Jacinto	73.2	73.3	0.1
R19	1918 Alsace Court, San Jacinto	70.0	70.2	0.2
R20	4946 Ashmead Drive, Hemet	72.3	72.5	0.2
R21	43052 Berkley Avenue, Hemet	68.6	68.8	0.2



Source: Cozad & Fox, Inc., 2026; Google Earth Pro, 2026

N

Receiver Location

Mobile Equipment Area Source

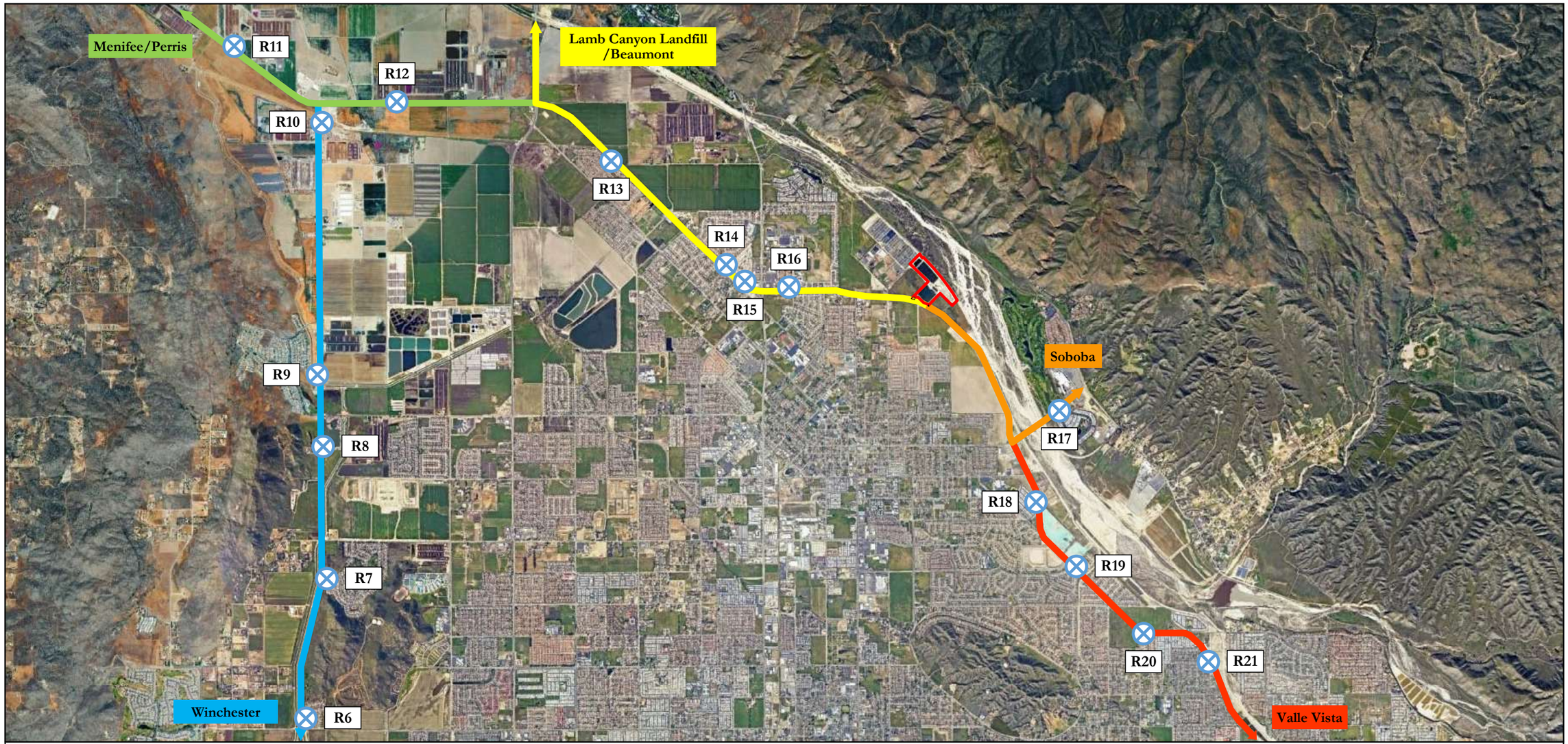
Soil Cement Batch Plant Point Source (Assumed Location)

Potential Construction Access Easement Area

Temporary Construction Access

Figure 4.

Construction Source and Receiver Locations



Source: Google Earth Pro, 2026

Receiver Location

Project Location

Potential Construction Access Easement Area

Temporary Construction Access

Figure 5.

Truck Haul Route Receiver Locations

As shown in Table 6, the noise level increase from project-generated truck haul routes is expected to be less than 3 dB at the nearest sensitive receptor locations. For this reason, project-generated traffic noise levels are expected to be less than significant.

5.3 CEQA Significance Determination

Noise impacts from the project site are summarized below and classified per the noise portion of the CEQA Environmental Checklist Form. This list summarizes conclusions made within the report and classifies the level of significance as: Potentially Significant Impact, Less than Significant with Mitigation Incorporated, Less than Significant Impact, or No Impact. *Italics* are used to denote language from the CEQA Environmental Checklist Form.

XIII. NOISE — Would the project result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact. As shown in Section 5.1 of this report, noise from temporary construction is expected to be less than significant considering a typical construction schedule and assuming that equipment is maintained in proper operating condition and using appropriate mufflers. Additionally, no construction activity may take place outside of the allowable operation hours detailed in Sections 2.3 and 5.1 herein, as per City of San Jacinto and County of Riverside requirements. For these reasons, this impact is deemed to be less than significant.

Additionally, as shown in Section 5.2 of this report, the noise level increase from project-generated truck haul routes is expected to be less than 3 dB. For this reason, project-generated traffic noise levels are expected to be less than significant.

As demonstrated above, the project is not expected to cause a substantial permanent or temporary increase in ambient noise levels, and therefore, this impact can be classified as less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. The use of the roller during construction has the potential to generate the highest vibration levels, as the roller has the highest vibration levels of the on-site equipment. According to the Federal Transit Administration Transit Noise and Vibration Assessment Manual (see reference), a vibratory roller, which is expected to be comparable to the worst-case equipment on site, generates a peak particle velocity (PPV) of approximately 0.210 inches/second at a distance of 25 feet from equipment. The evaluation of an impact's significance can be determined by reviewing both the likelihood of annoyance to individuals as well as the potential for damage to existing structures. According to the Caltrans Transportation and Construction Vibration Guidance Manual (see reference), the appropriate threshold for damage to modern residential structures is a PPV of 0.5 inches/second. Annoyance at surrounding residential receivers is assessed based on levels of perception, with a PPV of 0.01 being considered "barely perceptible," 0.04 inches/second as "distinctly perceptible," 0.1 inches/second as "strongly perceptible," and 0.4 inches/second as "severe."

The vibratory roller is expected to be used closest to adjacent residential receivers when the vibratory roller is used along the western boundary of the project site, which is located approximately 1,230 feet from the nearest off-site structure. At this distance, the PPV would be approximately 0.003 inches/second, which falls well below the building damage PPV criteria of 0.5 inches/second. At this distance, vibration levels would be below the "barely perceptible" threshold. As construction vibration is not anticipated to cause damage to off-site buildings and will not exceed the threshold of "barely perceptible" vibration, it is the opinion of the undersigned that temporary construction vibration impacts would not be "excessive" and therefore are less than significant.

Additionally, vibration impacts from the vibratory roller were evaluated at the pump station structure, located near the northeastern boundary of the project site. In order to ensure that vibration levels are below the building damage PPV criteria of 0.5 inches/second, the vibratory roller must not be used within 12 feet of the building structure.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project site is not located within two miles of any public airport or public use airport. The nearest airport to the project site is the Hemet-Ryan Airport, which is located approximately 6.2 miles to the southwest of the project site. Therefore, the proposed project would not expose people residing or working in the project area to excessive noise levels from such uses.

6.0 Conclusion

EMWD, as a public agency, is not subject to other jurisdictional agencies' established noise standards. However, EMWD follows a "good neighbor" approach to adhering to local noise standards. The noise standards of the Federal Transit Administration (FTA), the City of San Jacinto, and the County of Riverside are used for the purposes of evaluating the significance of the proposed Project's noise levels for the purposes of this analysis under CEQA.

Noise impacts from construction equipment were evaluated to determine if the construction noise levels would meet the FTA construction noise limit of 80 dBA. With operating hours being limited to those allowable in the City of San Jacinto and County of Riverside and standard good practice construction noise control measures being followed, temporary construction noise and vibration are expected to be less than significant at sensitive receptor locations.

Additionally, truck haul route and vendor trip noise impacts were evaluated to determine whether noise from the soil export haul routes and vendor trips would be significant. A significant direct impact occurs when project traffic combines with existing traffic and causes a doubling of sound energy, which is an increase of 3 dB. As detailed in Section 5.2 herein, the noise level increase from project-generated truck haul routes and vendor trips is expected to be less than 3 dB. For this reason, project-generated traffic noise levels are expected to be less than significant.

The proposed project is not expected to result in any potentially significant noise impacts by the standards of the California Environmental Quality Act (CEQA). Noise impacts are summarized in Section 5.3.

7.0 Certification

All recommendations for noise control are based on the best information available at the time our consulting services are provided. However, as there are many factors involved in sound transmission, and Eilar Associates has no control over the construction, workmanship, or materials, Eilar Associates is specifically not liable for final results of any recommendations or implementation of the recommendations.

This report is based on the related project information received and measured noise levels and represents a true and factual analysis of the acoustical impact issues associated with the Eastern Municipal Water District (EMWD) Alessandro Ponds Optimization Phase II Project, located near the intersection of West Ramona Expressway and Alessandro Avenue North in the City of San Jacinto and unincorporated Riverside County, California. This report was prepared by Mo Ouwenga and Amy Hool.



Mo Ouwenga, INCE
Senior Acoustical Consultant



Amy Hool, INCE
President/CEO

8.0 References

City of San Jacinto, City of San Jacinto Municipal Code, Chapter 8.40: Noise Control.

The Board of Supervisors of the County of Riverside, Ordinance No. 847, 2007.

U.S. Department of Transportation Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.

Kittelson and Associates, Inc., San Jacinto GPU Update Transportation Impact Analysis, 7 October 2021.

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Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guide, December 2011.

DataKustik, CadnaA (Computer Aided Noise Abatement), Version 2026 MR 1.

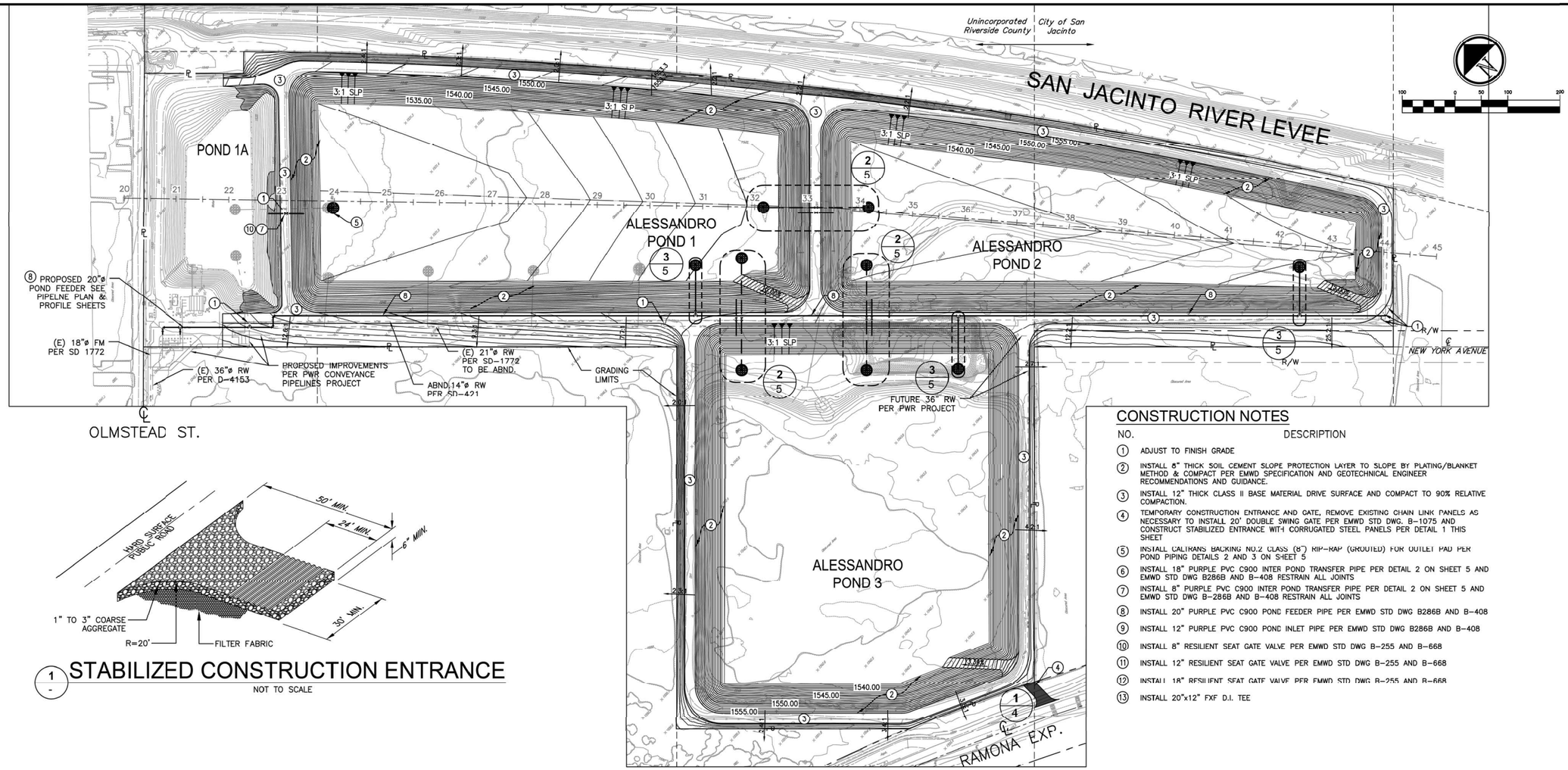
Traffic Distribution Study, by Katz-Okitsu and Associates Traffic Engineers, 1986.

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California Department of Transportation (Caltrans), Transportation and Construction Vibration Guidance Manual, April 2020.

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix A
Project Plans

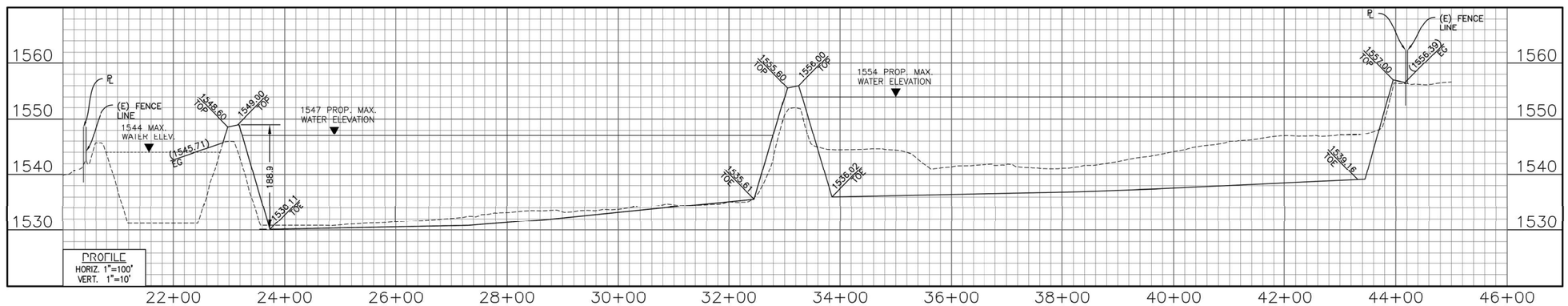


1 - STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

CONSTRUCTION NOTES

NO.	DESCRIPTION
1	ADJUST TO FINISH GRADE
2	INSTALL 6" THICK SOIL CEMENT SLOPE PROTECTION LAYER TO SLOPE BY PLATING/BLANKET METHOD & COMPACT PER EMWD SPECIFICATION AND GEOTECHNICAL ENGINEER RECOMMENDATIONS AND GUIDANCE.
3	INSTALL 12" THICK CLASS II BASE MATERIAL DRIVE SURFACE AND COMPACT TO 90% RELATIVE COMPACTION.
4	TEMPORARY CONSTRUCTION ENTRANCE AND GATE, REMOVE EXISTING CHAIN LINK PANELS AS NECESSARY TO INSTALL 20' DOUBLE SWING GATE PER EMWD STD DWG. B-1075 AND CONSTRUCT STABILIZED ENTRANCE WITH CORRUGATED STEEL PANELS PER DETAIL 1 THIS SHEET
5	INSTALL CALTRANS BACKING NO.2 CLASS (8") RIP-RAP (GROUTED) FOR OUTLET PAD PER POND PIPING DETAILS 2 AND 3 ON SHEET 5
6	INSTALL 18" PURPLE PVC C900 INTER POND TRANSFER PIPE PER DETAIL 2 ON SHEET 5 AND EMWD STD DWG B286B AND B-408 RESTRAIN ALL JOINTS
7	INSTALL 8" PURPLE PVC C900 INTER POND TRANSFER PIPE PER DETAIL 2 ON SHEET 5 AND EMWD STD DWG B-286B AND B-408 RESTRAIN ALL JOINTS
8	INSTALL 20" PURPLE PVC C900 POND FEEDER PIPE PER EMWD STD DWG B286B AND B-408
9	INSTALL 12" PURPLE PVC C900 POND INLET PIPE PER EMWD STD DWG B286B AND B-408
10	INSTALL 8" RESILIENT SEAT GATE VALVE PER EMWD STD DWG B-255 AND B-668
11	INSTALL 12" RESILIENT SEAT GATE VALVE PER EMWD STD DWG B-255 AND B-668
12	INSTALL 18" RESILIENT SEAT GATE VALVE PER EMWD STD DWG B-255 AND B-668
13	INSTALL 20"x12" FXF D.I. TEE



PRELIMINARY
60% SUBMITTAL

Underground Service Alert
DIG BEFORE YOU BEGIN
Call: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

REVISIONS					
No.	DATE	INITIAL	DESCRIPTION	APP'D	DATE

PRELIMINARY

PLANS PREPARED BY:
Cozad & Fox, Inc
CIVIL / STRUCTURAL ENGINEERS
MUNICIPAL CONSULTANTS / PLANNERS
SURVEYORS / GPS
151 South Grand Street, Hemet, Ca 92544
TEL. (951) 652-4454 • FAX (951) 766-8942

DATE:

BRIAN D. FOX P.E.
REGISTERED CIVIL ENGINEER, NO. 57264

APPROVED BY:

SENIOR DIRECTOR OF ENGINEERING DATE

REFERENCES

EASTERN MUNICIPAL WATER DISTRICT

PROJECT MANAGER DATE

APPROVALS		INITIAL	DATE
	PROJECT ENG.		
	INSPECTION		
	RECLAMATION OPERATIONS		
	MAINTENANCE		

	INITIAL
DESIGNED	MC
DRAWN	MC/GG
CHECKED	BF
SUBMITTED	

SCALE:
SCALE AS SHOWN

EASTERN MUNICIPAL WATER DISTRICT
RIVERSIDE COUNTY, CALIFORNIA

ALESSANDRO PONDS OPTIMIZATION PHASE II

GRADING PLAN

I.D.	-
S.A.	-
W.O.	X
C.O.	-
COORD.	
SHT. 4 OF 8	
	X
	C-1

January 05, 2023 at 4:06pm Z:\2504300\dwg\2504300_GRADING.dwg by WS216 on WS234

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix B

Applicable Noise Regulations

§ 8.40.060. Sensitive uses development projects.

A. New residential developments, mixed-use developments with a residential component, and other noise-sensitive development (including, but not limited to, schools, day cares, hospitals) shall be designed to minimize noise exposure to sensitive uses through the incorporation of site planning and architectural techniques.

B. New discretionary projects which have the potential to generate noise impacts which exceed the standards identified in this chapter shall be required to submit acoustical studies. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with the noise standards established in this chapter.

(Ord. 22-13 § 3 (Exh. A))

§ 8.40.070. Exemptions.

The following activities shall be exempted from the provisions of this chapter:

A. Any activity conducted on public property, or on private property with the consent of the owner, by any public entity or its officers, employees, representatives, agents, subcontractors, permittees, licensees or lessees that the public entity has authorized, shall be exempt from the provisions of this chapter. This includes, without limitation, sporting and recreational activities that are sponsored, co-sponsored, permitted or allowed by the city of San Jacinto or any school district within the city's jurisdictional boundaries. This also includes, without limitation, occasional outdoor gatherings, public dances, shows or sporting and entertainment events, provided such events are conducted pursuant to an approval, authorization, contract, lease, permit or sublease by the appropriate public entity, including the planning commission or city council;

B. Occasional outdoor gatherings, public dances, show, sporting and entertainment events, provided said events are conducted pursuant to a permit or license issued by the appropriate jurisdiction relative to the staging of said events;

C. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

D. Noise sources associated with construction, repair, remodeling, demolition or grading of any real property. Such activities shall instead be subject to the provisions of Section **8.40.090**;

E. Noise sources associated with construction, repair, remodeling, demolition or grading of public rights-of-way or during authorized seismic surveys;

F. All mechanical devices, apparatus or equipment associated with agriculture operations; provided, that:

    1. Operations do not take place between eight p.m. and seven a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday; or

    2. Such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions; or

    3. Such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the California Department of Agriculture;

G. Any activity to the extent regulation thereof has been preempted by state or federal law;

H. Any noise sources associated with people and/or music associated with a party at a residential property. Such noise shall be subject to the provisions of Section **8.40.080**;

I. Any noise source emanating from an ice cream truck within the city of San Jacinto. Such noise shall be subject to the provisions of Section **5.28.140**;

J. Any noise sources associated with barking dogs or other intermittent noises made by animals on any property within the city of San Jacinto. Such noise shall be subject to the provisions of Section 6.24.030;

K. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven a.m. and seven p.m.;

L. Noise sources related to uses approved by a permit or development agreement adopted prior to the date of adoption of the ordinance codified in this chapter and that contains acoustic or noise standard conditions of approval. This exemption shall only be applicable during the effective period of the city-approved permit or development agreement.

(Formerly 8.40.060; Ord. 07-17 § 2 (part); Ord. 22-13 § 3 (Exh. A))

§ 8.40.080. Loud and disturbing noise.

A. It is unlawful for any person or property owner within the city to make, cause or allow to be made any loud, excessive, impulsive or intrusive noise, disturbance or commotion that disturbs the peace or quiet of any area or that causes discomfort or annoyance to any reasonable person of normal sensitivities in the area. The types of loud, disturbing, excessive, impulsive or intrusive noise may include, but shall not be limited to, yelling, shouting, hooting, whistling, singing, playing a musical instrument, or emitting or transmitting any loud music or noise from any mechanical or electrical sound-making or sound-amplifying device.

B. The factors, standards, and conditions that may be considered in determining whether a violation of the provisions of this section has been committed include, but are not limited to, the following:

1. The level of the noise;
2. The level and intensity of the background (ambient) noise, if any;
3. The proximity of the noise to residential or commercial sleeping areas;
4. The nature and zoning of the area within which the noise emanates;
5. The density of inhabitation of the area within which the noise emanates;
6. The time of day and night the noise occurs;
7. The duration of the noise;
8. Whether the noise is constant, recurrent or intermittent;
9. Whether the noise is produced by a commercial or noncommercial activity;
10. Whether the use is lawful under the provisions of this code and whether the noise is one that could reasonably be expected from the activity or allowed use.

(Formerly 8.40.070; Ord. 07-17 § 2 (part); Ord. 22-13 § 3 (Exh. A))

§ 8.40.090. Construction activity noise regulations.

A. The erection (including excavation), demolition, alteration or repair of any building shall occur between the hours of seven a.m. and seven p.m. on weekdays and Saturdays, and between nine

a.m. and six p.m. on Sundays and holidays, except when such work complies with the terms of a temporary use permit which may be issued by the community development director or his or her designee, upon a showing of sufficient need due to hot or inclement weather, or the use of an unusually long process material, or other circumstances of unusual and compelling nature.

B. No landowner, construction company owner, contractor, subcontractor or employer shall permit or allow any person or persons working under their direction and control to operate any tool, equipment or machine in violation of the provisions of this section.

C. Exceptions.

1. The provisions of this section shall not apply to emergency construction work performed by a private party when authorized by the city manager or his or her designee;

2. The maintenance, repair or improvement of any public work or facility by public employees, by any person or persons acting pursuant to a public works contract, or by any person or persons performing such work or pursuant to the direction of, or on behalf of, any public agency; provided, however, this exception shall not apply to the city of San Jacinto, or its employees, contractors or agents, unless:

a. The city manager or a department head determines that the maintenance, repair or improvement is immediately necessary to maintain public services; or

b. The maintenance, repair or improvement is of a nature that cannot feasibly be conducted during normal business hours; or

c. The city council has approved project specifications, contract provisions, or an environmental document that specifically authorizes construction during hours of the day that would otherwise be prohibited pursuant to this section;

3. Any construction that complies with the noise limits specified in Section **8.40.040** or **8.40.050**.

(Ord. 07-17 § 2 (part); Ord. 15-07 § 1; Ord. 22-13 § 3 (Exh. A))

§ 8.40.100. Other public agency exceptions.

The provisions of this chapter shall not be construed to prohibit any work at different hours by or under the direction of any other public agency or public or private utility company in cases of necessity or emergency.

(Ord. 07-17 § 2 (part); Ord. 22-13 § 3 (Exh. A))

§ 8.40.110. Schools, day care centers, churches, libraries, museums, health care institutions—Special provisions.

It is unlawful for any person to create any noise that causes the outdoor noise level at any school, day care center, hospital or similar health care institution, church, library or museum while the same is in use, to exceed the noise standards specified in this chapter.

(Ord. 07-17 § 2 (part); Ord. 22-13 § 3 (Exh. A))

§ 8.40.120. Sound-amplifying equipment.

Loudspeakers, sound amplifiers, public address systems or similar devices used to amplify sounds shall be subject to the provisions of Section **8.40.130**. Such sound-amplifying equipment shall not be construed to include electronic devices, including, but not limited to, radios, tape players, tape recorders, compact disc players, MP3 players, electric keyboards, music synthesizers, record players or televisions, which are designed and operated for personal use, or used entirely within a building and are

ORDINANCE NO. 847
(AS AMENDED THROUGH 847.1)
AN ORDINANCE OF THE COUNTY OF RIVERSIDE AMENDING
ORDINANCE NO. 847 REGULATING NOISE

The Board of Supervisors of the County of Riverside Ordains as Follows:

Section 1. INTENT. At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the Board of Supervisors hereby declares that noise shall be regulated in the manner described herein. This ordinance is intended to establish countywide standards regulating noise. This ordinance is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are hereby established.

Section 2. EXEMPTIONS. Sound emanating from the following sources is exempt from the provisions of this ordinance:

a. Facilities owned or operated by or for a governmental agency.
b. Capital improvement projects of a governmental agency.
c. The maintenance or repair of public properties.
d. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile.
e. Public or private schools and school-sponsored activities
f. Agricultural operations on land designated Agriculture in the Riverside County General Plan, or land zoned A-1 (Light Agriculture), A-P (Light Agriculture With Poultry), A-2 (Heavy Agriculture), A-D (Agriculture-Dairy) or C/V (Citrus/Vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile.
g. Wind Energy Conversion Systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348.
h. Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling.
i. Private construction projects located within one-quarter (1/4) of a mile from an inhabited dwelling, provided that:
    1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; and
    2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

j. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7 a.m. and 8 p.m.

k. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems

l. Heating and air conditioning equipment.

m. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare.

n. The discharge of firearms consistent with all state laws.

Section 3. DEFINITIONS. As used in this ordinance, the following terms shall have the following meanings:

a. Audio Equipment. A television, stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

b. Decibel (dB). A unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

1. A-weighting (dBA) means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

2. Maximum Sound level (L_{max}) means the maximum sound level measured on a sound level meter.

c. Governmental Agency. The United States, the State of California, Riverside County, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

d. Land Use Permit. A discretionary permit issued by Riverside County pursuant to Riverside County Ordinance No. 348.

e. Motor Vehicle. A vehicle that is self-propelled.

f. Motor Vehicle Sound System. A stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

g. Noise. Any loud, discordant or disagreeable sound.

h. Occupied Property. Property upon which is located a residence, business or industrial or manufacturing use.

i. Off-Highway Vehicle. A motor vehicle designed to travel over any terrain.

j. Public Property. Property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

Eilar Associates, Inc.
Acoustical and Environmental Consulting Services

Appendix C

CadnaA Analysis Data and Results

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 27 May 2026

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (NONE)	
Strictly acc. to AzB	

Receivers

Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
				Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
				(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
NML1				64.2	-70.7	65.4	0.0				3.00	r	8362.31	7187.48	1553.10

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflec	
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)
Ramona (w/o Warren)				69.7	0.0	0.0			1199.0	0.0	0.0	8.5	0.0	0.0	55		4.27	0.0	1	0.0	0.0	
Ramona (w/o Warren)				69.7	0.0	0.0			1199.0	0.0	0.0	8.5	0.0	0.0	55		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				71.7	0.0	0.0			1280.0	0.0	0.0	8.5	0.0	0.0	65		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				71.7	0.0	0.0			1280.0	0.0	0.0	8.5	0.0	0.0	65		23	0.0	1	0.0	0.0	
Ramona (b/w Lyon and State)				70.5	0.0	0.0			1432.0	0.0	0.0	8.5	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				69.9	0.0	0.0			1265.0	0.0	0.0	8.5	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				69.9	0.0	0.0			1265.0	0.0	0.0	8.5	0.0	0.0	55		16	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				69.9	0.0	0.0			1265.0	0.0	0.0	8.5	0.0	0.0	55		8	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				67.9	0.0	0.0			991.0	0.0	0.0	8.5	0.0	0.0	50		9	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				67.9	0.0	0.0			991.0	0.0	0.0	8.5	0.0	0.0	50		17.6	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				66.2	0.0	0.0			624.0	0.0	0.0	5.0	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				66.2	0.0	0.0			624.0	0.0	0.0	5.0	0.0	0.0	55		13.5	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				66.2	0.0	0.0			624.0	0.0	0.0	5.0	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (s/o Esplanade)				66.9	0.0	0.0			736.0	0.0	0.0	5.0	0.0	0.0	55		4.88	0.0	1	0.0	0.0	
Lake Park Drive				65.4	0.0	0.0			649.0	0.0	0.0	5.0	0.0	0.0	50		12.5	0.0	1	0.0	0.0	

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-20114.14	19276.81	1554.81	1554.81		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-15553.43	15804.25	1554.06	1554.06		
					-15412.58	15698.18	1554.03	1554.03		
					-15209.13	15578.20	1554.00	1554.00		
					-15028.29	15489.52	1553.97	1553.97		
					-14846.58	15429.53	1553.94	1553.94		
					-14690.08	15389.97	1553.91	1553.91		
					-14615.74	15376.93	1553.90	1553.90		
					-14528.80	15366.06	1553.89	1553.89		
					-14418.39	15356.05	1553.87	1553.87		
					-14366.63	15355.71	1553.86	1553.86		
Ramona (b/w Warren and Lyon)	0.00	r			-14366.63	15355.71	1553.86	1553.86		
					-14150.14	15353.10	1553.82	1553.82		
					-12919.14	15364.88	1553.62	1553.62		
					-12150.97	15356.18	1553.49	1553.49		
					-11122.88	15362.21	1553.32	1553.32		
					-7208.62	15387.05	1552.68	1552.68		
					-5413.14	15394.72	1552.38	1552.38		
					-5218.15	15384.86	1552.35	1552.35		
Ramona (b/w Warren and Lyon)	0.00	r			-5218.15	15384.86	1552.35	1552.35		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					-4928.30	15335.17	1552.30	1552.30		
					-4592.91	15244.08	1552.24	1552.24		
					-4265.79	15104.67	1552.19	1552.19		
					-3999.41	14965.27	1552.14	1552.14		
					-3753.73	14794.12	1552.10	1552.10		
					-3541.20	14621.03	1552.07	1552.07		
					-2967.16	14051.38	1551.97	1551.97		
					-1348.14	12448.91	1551.71	1551.71		
					389.99	10723.27	1551.42	1551.42		
Ramona (b/w Lyon and State)	0.00	r			389.99	10723.27	1551.42	1551.42		
					2271.35	8855.71	1551.11	1551.11		
					3192.20	7941.82	1550.96	1550.96		
					3255.74	7889.24	1550.94	1550.94		
					3411.72	7770.53	1550.92	1550.92		
					3486.25	7724.29	1550.91	1550.91		
					3577.35	7671.84	1550.89	1550.89		
					3655.34	7629.74	1550.88	1550.88		
					3793.38	7570.38	1550.86	1550.86		
					3890.00	7535.19	1550.84	1550.84		
					3999.04	7502.75	1550.82	1550.82		
					4130.17	7472.38	1550.80	1550.80		
					4269.30	7446.73	1550.78	1550.78		
					4354.52	7444.56	1550.76	1550.76		
Ramona (b/w State and Esplanade)	0.00	r			4354.52	7444.56	1550.76	1550.76		
					5210.33	7445.94	1550.62	1550.62		
					5605.98	7450.28	1550.56	1550.56		
					5783.80	7448.11	1550.53	1550.53		
					6050.39	7447.67	1550.48	1550.48		
Ramona (b/w State and Esplanade)	0.00	r			6050.39	7447.67	1550.48	1550.48		
					6933.89	7447.67	1550.34	1550.34		
					7518.48	7441.46	1550.24	1550.24		
					7719.33	7426.97	1550.21	1550.21		
					8554.46	7275.12	1550.07	1550.07		
					8858.84	7221.98	1550.02	1550.02		
					9018.97	7207.48	1550.00	1550.00		
					9295.04	7195.75	1550.00	1550.00		
					10032.47	7190.53	1550.71	1550.71		
					10328.13	7154.01	1552.44	1552.44		
					10587.27	7107.05	1553.98	1553.98		
					10902.07	7018.35	1554.67	1554.67		
					11256.86	6880.95	1554.64	1554.64		
					11583.83	6719.21	1554.75	1554.75		
					11879.50	6529.64	1555.01	1555.01		
					12270.15	6208.00	1555.23	1555.23		
					12622.16	5854.62	1555.29	1555.29		
					13378.62	5103.67	1555.46	1555.46		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					13750.04	4485.73	1555.04	1555.04		
Ramona (b/w State and Esplanade)	0.00	r			13750.04	4485.73	1555.04	1555.04		
					14668.38	2384.70	1553.00	1553.00		
					14744.90	2165.55	1552.74	1552.74		
					14807.52	1915.10	1552.40	1552.40		
					14852.74	1525.50	1551.77	1551.77		
					14866.54	1339.14	1551.45	1551.45		
					14913.48	1069.95	1551.43	1551.43		
					14965.94	905.67	1551.47	1551.47		
					15136.86	546.29	1551.57	1551.57		
					15660.60	-391.61	1551.83	1551.83		
					15765.78	-581.16	1551.88	1551.88		
					15832.62	-725.79	1551.92	1551.92		
					15867.68	-821.12	1551.95	1551.95		
					15907.12	-940.54	1551.98	1551.98		
					15944.38	-1068.74	1552.01	1552.01		
					15993.95	-1268.76	1552.07	1552.07		
					16024.38	-1420.95	1552.11	1552.11		
					16051.34	-1585.31	1552.15	1552.15		
					16065.26	-1678.36	1552.18	1552.18		
					16083.20	-1877.15	1552.23	1552.23		
					16099.77	-2129.78	1552.30	1552.30		
					16123.24	-2567.40	1552.42	1552.42		
					16163.27	-2731.67	1552.47	1552.47		
					16259.91	-2919.42	1552.52	1552.52		
					16393.81	-3086.46	1552.56	1552.56		
					17143.46	-3839.58	1552.77	1552.77		
					17351.62	-4038.98	1552.82	1552.82		
Ramona (s/o Esplanade)	0.00	r			17351.62	-4038.98	1552.82	1552.82		
					18202.18	-4879.68	1553.05	1553.05		
					19192.36	-5857.42	1553.32	1553.32		
					20076.91	-6715.67	1553.55	1553.55		
					20187.62	-6805.56	1553.57	1553.57		
					20306.00	-6885.57	1553.60	1553.60		
					20410.96	-6942.88	1553.61	1553.61		
					20521.44	-6980.86	1553.62	1553.62		
					20609.82	-7003.65	1553.63	1553.63		
					20788.66	-7009.17	1553.63	1553.63		
					21487.26	-7013.52	1553.63	1553.63		
					22163.97	-7019.74	1553.63	1553.63		
					22272.38	-7037.69	1553.64	1553.64		
					22474.06	-7152.78	1553.67	1553.67		
					22652.73	-7282.12	1553.70	1553.70		
					22802.90	-7438.87	1553.75	1553.75		
Ramona (s/o Esplanade)	0.00	r			22802.90	-7438.87	1553.75	1553.75		
					22916.90	-7564.38	1553.78	1553.78		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					22987.60	-7653.72	1553.81	1553.80		
					23053.92	-7735.93	1553.83	1553.83		
					23114.82	-7823.80	1553.85	1553.85		
					23176.59	-7915.15	1553.88	1553.88		
					23235.75	-8009.99	1553.90	1553.90		
					23281.00	-8090.90	1553.92	1553.92		
					23350.60	-8225.75	1553.96	1553.96		
					23444.56	-8445.00	1554.02	1554.02		
					23528.95	-8653.80	1554.08	1554.08		
					23637.71	-8913.94	1554.15	1554.15		
Warren (n/o Esplanade)	0.00	r			-14372.66	15355.71	1553.86	1553.86		
					-14371.85	15284.39	1553.86	1553.86		
					-14367.94	14858.20	1553.86	1553.86		
					-14363.01	14078.51	1553.86	1553.86		
					-14371.77	6054.66	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14371.77	6054.66	1553.86	1553.86		
					-14380.06	4998.40	1553.86	1553.86		
					-14379.19	4499.12	1553.86	1553.86		
					-14370.49	3572.76	1553.86	1553.86		
					-14351.35	2207.12	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14351.35	2207.12	1553.86	1553.86		
					-14334.91	1239.95	1553.85	1553.85		
					-14325.05	296.89	1553.85	1553.85		
					-14286.39	-3112.34	1553.85	1553.85		
Warren (s/o Esplanade)	0.00	r			-14286.39	-3112.34	1553.85	1553.85		
					-14272.04	-4409.31	1553.84	1553.84		
					-14274.23	-4613.16	1553.84	1553.84		
					-14276.97	-4689.88	1553.84	1553.84		
					-14284.64	-4774.27	1553.85	1553.85		
					-14298.89	-4887.15	1553.85	1553.85		
					-14327.38	-5024.15	1553.85	1553.85		
					-14401.95	-5335.53	1553.87	1553.86		
					-14500.58	-5736.65	1553.88	1553.88		
					-15144.30	-8372.40	1554.00	1554.00		
					-15157.42	-9740.15	1554.37	1554.37		
					-15153.96	-9887.90	1554.41	1554.41		
					-15140.48	-10178.01	1554.49	1554.49		
					-15123.91	-11181.92	1554.77	1554.77		
					-15111.85	-11371.53	1554.82	1554.82		
					-15096.51	-11483.33	1554.85	1554.85		
					-15052.67	-11649.92	1554.89	1554.89		
Lake Park Drive	0.00	r			14928.73	1048.11	1551.44	1551.44		
					15075.72	1120.30	1551.47	1551.47		
					15831.82	1604.64	1553.94	1553.94		
					16321.93	1975.68	1555.69	1555.69		
					16765.12	2344.99	1556.47	1556.47		

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		
			17211.66	2726.34	1556.42	1556.42		
			17996.26	3392.59	1556.32	1556.32		

Terrain Contours

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
cLimits					1555.00		-21264.86	23955.86	1555.00
							28735.14	23955.86	1555.00
							28735.14	-12044.14	1555.00
							-21264.86	-12044.14	1555.00
							-21264.86	23955.86	1555.00
c1545					1545.00		10772.57	8633.64	1545.00
							10764.75	8620.39	1545.00
							10764.97	8605.19	1545.00
							10775.83	8587.82	1545.00
							10816.23	8546.99	1545.00
							10817.96	8533.09	1545.00
							10809.49	8511.15	1545.00
							10806.67	8496.38	1545.00
							10811.87	8487.08	1545.00
							10875.63	8434.54	1545.00
							10880.82	8437.01	1545.00
							11076.72	8641.16	1545.00
							11154.47	8725.21	1545.00
							11155.68	8735.03	1545.00
							11152.40	8743.13	1545.00
							11116.03	8782.95	1545.00
							11071.56	8820.01	1545.00
							11040.29	8844.99	1545.00
							11016.39	8853.90	1545.00
							10999.24	8851.29	1545.00
							10982.51	8840.65	1545.00
							10772.57	8633.64	1545.00
c1540					1540.00		10788.30	8627.47	1540.00
							10984.64	8818.60	1540.00
							10998.32	8821.20	1540.00
							11025.47	8810.56	1540.00
							11050.01	8798.18	1540.00
							11097.14	8779.29	1540.00
							11135.93	8738.95	1540.00
							11136.27	8731.19	1540.00
							11122.48	8712.40	1540.00
							10882.92	8460.68	1540.00
							10873.48	8455.89	1540.00
							10839.28	8482.85	1540.00
							10826.28	8496.12	1540.00
							10825.19	8504.19	1540.00
							10836.13	8533.06	1540.00
							10835.58	8541.00	1540.00
							10830.24	8549.61	1540.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							10787.69	8593.53	1540.00
							10783.31	8603.39	1540.00
							10782.08	8614.33	1540.00
							10788.30	8627.47	1540.00
c1535					1535.00		11115.66	8727.93	1535.00
							11117.50	8732.79	1535.00
							11116.48	8739.01	1535.00
							11086.29	8768.77	1535.00
							11043.39	8776.80	1535.00
							11006.58	8779.84	1535.00
							10985.40	8787.66	1535.00
							10969.87	8784.95	1535.00
							10813.00	8630.32	1535.00
							10800.27	8612.39	1535.00
							10800.00	8602.68	1535.00
							10805.06	8592.55	1535.00
							10844.74	8552.05	1535.00
							10849.95	8542.50	1535.00
							10851.36	8534.35	1535.00
							10849.41	8523.16	1535.00
							10842.79	8507.31	1535.00
							10843.87	8499.82	1535.00
							10871.92	8475.32	1535.00
							10877.26	8476.56	1535.00
							11115.66	8727.93	1535.00
c1532 (Pond 1A Bottom)					1532.00		10967.43	8768.90	1532.00
							10973.95	8771.07	1532.00
							10998.27	8762.60	1532.00
							11071.47	8763.47	1532.00
							11081.35	8760.43	1532.00
							11105.46	8738.16	1532.00
							11105.90	8729.80	1532.00
							10881.09	8492.83	1532.00
							10874.66	8489.96	1532.00
							10867.41	8491.06	1532.00
							10855.37	8501.59	1532.00
							10853.32	8508.02	1532.00
							10858.79	8524.03	1532.00
							10860.29	8536.21	1532.00
							10857.42	8547.57	1532.00
							10850.72	8556.73	1532.00
							10816.93	8592.76	1532.00
							10811.24	8602.07	1532.00
							10815.20	8614.31	1532.00
							10826.15	8630.32	1532.00
							10967.43	8768.90	1532.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
c1545					1545.00		10979.11	8077.73	1545.00
							11009.45	8088.07	1545.00
							11001.52	8142.20	1545.00
							11020.48	8169.44	1545.00
							11013.10	8195.94	1545.00
							10863.68	8342.35	1545.00
							10875.18	8356.85	1545.00
							10827.83	8398.18	1545.00
							10821.75	8417.72	1545.00
							10787.21	8458.78	1545.00
							10776.57	8494.40	1545.00
							10731.96	8536.27	1545.00
							10721.84	8556.24	1545.00
							10722.93	8577.59	1545.00
							10729.23	8595.93	1545.00
							10724.85	8605.50	1545.00
							10730.87	8618.09	1545.00
							10788.89	8678.84	1545.00
							10853.88	8740.05	1545.00
							10985.29	8871.02	1545.00
							10999.84	8881.88	1545.00
							11009.40	8883.62	1545.00
							11033.73	8881.01	1545.00
							11047.41	8871.89	1545.00
							11148.61	8785.17	1545.00
							11176.88	8783.79	1545.00
							11231.36	8752.25	1545.00
							11271.76	8715.10	1545.00
							11396.00	8589.56	1545.00
							11553.58	8424.74	1545.00
c1545					1545.00		11171.51	8946.86	1545.00
							11123.24	8985.31	1545.00
							11109.28	8977.20	1545.00
							11127.34	8946.14	1545.00
							11137.53	8921.03	1545.00
							11148.99	8894.64	1545.00
							11154.37	8887.74	1545.00
							11195.92	8856.54	1545.00
							11220.55	8833.00	1545.00
							11268.03	8784.15	1545.00
							11328.03	8718.47	1545.00
							11397.13	8631.85	1545.00
							11432.84	8588.20	1545.00
							11445.57	8589.29	1545.00
							11480.22	8553.78	1545.00
							11583.40	8440.20	1545.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11725.99	8261.76	1545.00
							11700.85	8258.79	1545.00
							11553.58	8424.74	1545.00
c1531					1531.00		10973.42	8409.12	1531.00
							11206.61	8654.63	1531.00
c1535					1535.00		11700.85	8107.58	1535.00
							11576.71	8262.06	1535.00
							11463.13	8395.07	1535.00
							11365.97	8504.00	1535.00
							11212.98	8666.57	1535.00
							11203.12	8667.12	1535.00
							10962.43	8416.43	1535.00
							10961.40	8402.64	1535.00
							11186.02	8186.71	1535.00
							11453.95	7936.36	1535.00
							11512.92	7886.36	1535.00
							11530.85	7916.02	1535.00
							11588.44	7897.74	1535.00
							11632.23	7899.12	1535.00
							11651.54	7899.81	1535.00
							11713.27	7957.05	1535.00
							11742.24	7993.26	1535.00
							11727.06	8045.68	1535.00
							11745.68	8050.85	1535.00
							11700.85	8107.58	1535.00
c1550					1550.00		11350.91	8590.33	1550.00
							11540.59	8373.83	1550.00
							11664.31	8226.58	1550.00
							11824.98	8024.58	1550.00
							11833.46	8008.98	1550.00
							11834.28	7996.66	1550.00
							11830.72	7984.07	1550.00
							11823.77	7974.29	1550.00
							11618.48	7764.65	1550.00
							11608.26	7760.52	1550.00
							11597.62	7761.83	1550.00
							11586.97	7770.52	1550.00
							11565.47	7773.78	1550.00
							11468.58	7859.15	1550.00
							11310.92	8006.14	1550.00
							11055.72	8246.50	1550.00
c1549					1549.00		11308.91	8631.00	1549.00
							11238.73	8707.04	1549.00
							11222.00	8714.62	1549.00
							11203.21	8715.49	1549.00
							11185.79	8708.76	1549.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11168.55	8693.07	1549.00
							10923.27	8434.76	1549.00
							10913.15	8413.96	1549.00
							10914.24	8391.79	1549.00
							10930.39	8367.15	1549.00
							11048.09	8257.39	1549.00
c1555					1555.00		11735.33	8160.32	1555.00
							11841.90	8028.07	1555.00
							11849.31	8012.72	1555.00
							11850.35	7994.44	1555.00
							11846.55	7980.30	1555.00
							11838.79	7967.72	1555.00
							11696.19	7822.53	1555.00
							11622.97	7746.71	1555.00
							11604.36	7740.55	1555.00
							11589.44	7740.55	1555.00
							11570.00	7745.20	1555.00
							11561.79	7749.31	1555.00
							11436.84	7870.29	1555.00
c1540					1540.00		11883.67	7902.60	1540.00
							11874.36	7904.06	1540.00
							11682.95	7710.05	1540.00
							11681.21	7702.88	1540.00
							11688.38	7693.32	1540.00
							11987.91	7402.93	1540.00
							12257.76	7133.08	1540.00
							12314.01	7076.56	1540.00
							12333.58	7075.74	1540.00
							12376.69	7035.09	1540.00
							12454.15	7113.08	1540.00
							12365.86	7247.59	1540.00
							12248.10	7427.06	1540.00
							12158.58	7551.33	1540.00
							12041.26	7702.77	1540.00
							11983.49	7776.41	1540.00
							11883.67	7902.60	1540.00
c1537					1537.00		11690.51	7704.43	1537.00
							11878.02	7895.23	1537.00
c1557					1557.00		12212.26	7556.40	1557.00
							12282.34	7456.48	1557.00
							12424.96	7246.52	1557.00
							12499.15	7132.91	1557.00
							12502.71	7116.48	1557.00
							12500.79	7099.51	1557.00
							12493.67	7084.73	1557.00
							12401.69	6990.01	1557.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							12384.53	6980.45	1557.00
							12376.71	6976.32	1557.00
							12363.02	6976.54	1557.00
							12348.24	6979.80	1557.00
							12336.07	6986.75	1557.00
							12127.05	7191.21	1557.00
							11976.26	7339.39	1557.00
c1556					1556.00		11935.43	7381.28	1556.00
							11639.05	7671.35	1556.00
							11630.58	7690.04	1556.00
							11628.19	7706.34	1556.00
							11632.43	7721.39	1556.00
							11639.83	7733.71	1556.00
							11689.91	7784.77	1556.00
							11851.56	7949.16	1556.00
							11866.76	7956.97	1556.00
							11883.05	7958.61	1556.00
							11903.99	7952.86	1556.00
							11917.27	7941.77	1556.00
							11965.45	7881.82	1556.00
							12185.99	7593.27	1556.00
c1556					1556.00		11184.07	7050.31	1556.00
							10934.81	7295.33	1556.00
							10926.60	7309.84	1556.00
							10923.72	7327.09	1556.00
							10925.78	7340.78	1556.00
							10934.47	7357.83	1556.00
							10953.44	7377.84	1556.00
							11164.19	7592.73	1556.00
							11392.51	7823.24	1556.00
							11403.46	7830.83	1556.00
							11415.36	7834.19	1556.00
							11427.86	7834.79	1556.00
							11441.33	7831.64	1556.00
							11453.39	7825.78	1556.00
							11463.93	7816.11	1556.00
							11830.07	7456.06	1556.00
							11838.32	7442.47	1556.00
							11841.80	7427.37	1556.00
							11841.04	7415.53	1556.00
							11837.56	7402.17	1556.00
							11830.83	7392.06	1556.00
							11421.40	6975.22	1556.00
							11409.15	6966.42	1556.00
							11397.94	6962.80	1556.00
							11386.04	6961.59	1556.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11373.79	6963.14	1556.00
							11365.17	6966.42	1556.00
							11191.15	7044.55	1556.00
							11184.07	7050.31	1556.00
c1537					1537.00		11395.18	7030.03	1537.00
							11320.21	7062.95	1537.00
							11299.35	7058.50	1537.00
							11222.15	7092.86	1537.00
							10983.97	7326.72	1537.00
							11193.96	7540.82	1537.00
							11422.70	7773.39	1537.00
							11425.43	7773.52	1537.00
							11780.50	7424.11	1537.00
							11562.30	7201.53	1537.00
							11395.18	7030.03	1537.00
c1550					1550.00		8968.61	6326.41	1550.00
							8968.61	8210.05	1550.00
							9703.67	9023.56	1550.00
							10409.81	8341.46	1550.00
							10594.70	7824.04	1550.00
							10782.35	7348.01	1550.00
							9927.04	7257.62	1550.00
							9645.42	6318.86	1550.00
							8968.61	6326.41	1550.00
c1555					1555.00		10780.03	7146.88	1555.00
							11453.55	6897.18	1555.00
							11600.30	6833.66	1555.00

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 27 May 2026

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (NONE)	
Strictly acc. to AzB	

Receivers

Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
				Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
				(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1				54.8	-80.2	0.0	0.0		x	Total	5.00	r	9876.79	7821.86	1555.00
R2				53.0	-80.2	0.0	0.0		x	Total	5.00	r	9624.86	7481.21	1555.00
R3				51.3	-80.2	0.0	0.0		x	Total	5.00	r	9627.25	6892.16	1555.00
R4				49.9	-80.2	0.0	0.0		x	Total	5.00	r	9927.91	5927.29	1555.11
R5				52.2	-80.2	0.0	0.0		x	Total	5.00	r	11801.72	5611.64	1558.13

Point Sources

Name	Sel.	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
				Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
				(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		(ft)		(ft)	(ft)	(ft)
Soil Cement Batch Plant				114.0	114.0	114.0	Lw	C11		0.0	0.0	0.0				9.00	0.00	0.00	0.0		(none)	10.00	r	10847.31	7209.59	1565.43

Area Sources

Name	Sel.	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
				Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
				(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(ft²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Backhoe/Loader				113.0	10.0	10.0	61.1	-41.9	-41.9	PWL-Pt	C1		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Dozer				114.1	11.1	11.1	62.2	-40.8	-40.8	PWL-Pt	C2		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Drill Rig				114.6	14.6	14.6	62.7	-37.3	-37.3	PWL-Pt	C3		0.0	0.0	0.0				30.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0
Dump Truck				119.0	12.0	12.0	67.1	-39.9	-39.9	PWL-Pt	C4		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	5.0	0.0	0.0
Excavator				116.4	13.4	13.4	64.5	-38.5	-38.5	PWL-Pt	C5		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	2.0	0.0	0.0
Grader				117.5	17.5	17.5	65.6	-34.4	-34.4	PWL-Pt	C6		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0
Pick-Up Truck				112.3	7.5	7.5	60.4	-44.3	-44.3	PWL-Pt	C7		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	3.0	0.0	0.0
Pump				109.1	9.1	9.1	57.2	-42.8	-42.8	PWL-Pt	C8		0.0	0.0	0.0				30.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0
Roller				110.6	10.6	10.6	58.8	-41.2	-41.2	PWL-Pt	C9		0.0	0.0	0.0				12.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0
Scraper				122.3	17.5	17.5	70.4	-34.4	-34.4	PWL-Pt	C10		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	3.0	0.0	0.0
Utility Truck				107.5	7.5	7.5	55.7	-44.3	-44.3	PWL-Pt	C12		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0
Water Truck				110.4	10.4	10.4	58.5	-41.5	-41.5	PWL-Pt	C13		0.0	0.0	0.0				24.00	0.00	0.00	0.0		(none)	1.0	0.0	0.0

Geometry - Area Sources

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Backhoe/Loader		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Dozer		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Drill Rig		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Dump Truck		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Excavator		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Grader		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Pick-Up Truck		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Pump		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Roller		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Scraper		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Utility Truck		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02
Water Truck		6.00	r			11851.95	7369.67	1562.16	1556.16
						12337.18	6894.31	1562.75	1556.75
						12549.01	7108.90	1562.99	1556.99
						12226.43	7586.74	1562.74	1556.74
						11799.24	8142.64	1554.75	1548.75
						11412.03	8579.67	1551.00	1545.00
						11175.98	8823.39	1551.00	1545.00
						11145.86	8793.82	1551.00	1545.00
						11011.68	8925.81	1551.13	1545.13
						10643.64	8555.57	1552.25	1546.25
						11364.04	7850.36	1560.74	1554.74
						10855.79	7330.06	1559.07	1553.07
						10758.30	7213.40	1559.29	1553.29
						10744.61	7161.92	1560.53	1554.53
						11006.40	7081.96	1561.38	1555.38
						11224.38	6999.80	1561.35	1555.35
						11404.83	6916.31	1561.02	1555.02

Terrain Contours

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
cLimits					1555.00		-21264.86	23955.86	1555.00
							28735.14	23955.86	1555.00
							28735.14	-12044.14	1555.00
							-21264.86	-12044.14	1555.00
							-21264.86	23955.86	1555.00
c1545					1545.00		10772.57	8633.64	1545.00
							10764.75	8620.39	1545.00
							10764.97	8605.19	1545.00
							10775.83	8587.82	1545.00
							10816.23	8546.99	1545.00
							10817.96	8533.09	1545.00
							10809.49	8511.15	1545.00
							10806.67	8496.38	1545.00
							10811.87	8487.08	1545.00
							10875.63	8434.54	1545.00
							10880.82	8437.01	1545.00
							11076.72	8641.16	1545.00
							11154.47	8725.21	1545.00
							11155.68	8735.03	1545.00
							11152.40	8743.13	1545.00
							11116.03	8782.95	1545.00
							11071.56	8820.01	1545.00
							11040.29	8844.99	1545.00
							11016.39	8853.90	1545.00
							10999.24	8851.29	1545.00
							10982.51	8840.65	1545.00
							10772.57	8633.64	1545.00
c1540					1540.00		10788.30	8627.47	1540.00
							10984.64	8818.60	1540.00
							10998.32	8821.20	1540.00
							11025.47	8810.56	1540.00
							11050.01	8798.18	1540.00
							11097.14	8779.29	1540.00
							11135.93	8738.95	1540.00
							11136.27	8731.19	1540.00
							11122.48	8712.40	1540.00
							10882.92	8460.68	1540.00
							10873.48	8455.89	1540.00
							10839.28	8482.85	1540.00
							10826.28	8496.12	1540.00
							10825.19	8504.19	1540.00
							10836.13	8533.06	1540.00
							10835.58	8541.00	1540.00
							10830.24	8549.61	1540.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							10787.69	8593.53	1540.00
							10783.31	8603.39	1540.00
							10782.08	8614.33	1540.00
							10788.30	8627.47	1540.00
c1535					1535.00		11115.66	8727.93	1535.00
							11117.50	8732.79	1535.00
							11116.48	8739.01	1535.00
							11086.29	8768.77	1535.00
							11043.39	8776.80	1535.00
							11006.58	8779.84	1535.00
							10985.40	8787.66	1535.00
							10969.87	8784.95	1535.00
							10813.00	8630.32	1535.00
							10800.27	8612.39	1535.00
							10800.00	8602.68	1535.00
							10805.06	8592.55	1535.00
							10844.74	8552.05	1535.00
							10849.95	8542.50	1535.00
							10851.36	8534.35	1535.00
							10849.41	8523.16	1535.00
							10842.79	8507.31	1535.00
							10843.87	8499.82	1535.00
							10871.92	8475.32	1535.00
							10877.26	8476.56	1535.00
							11115.66	8727.93	1535.00
c1532 (Pond 1A Bottom)					1532.00		10967.43	8768.90	1532.00
							10973.95	8771.07	1532.00
							10998.27	8762.60	1532.00
							11071.47	8763.47	1532.00
							11081.35	8760.43	1532.00
							11105.46	8738.16	1532.00
							11105.90	8729.80	1532.00
							10881.09	8492.83	1532.00
							10874.66	8489.96	1532.00
							10867.41	8491.06	1532.00
							10855.37	8501.59	1532.00
							10853.32	8508.02	1532.00
							10858.79	8524.03	1532.00
							10860.29	8536.21	1532.00
							10857.42	8547.57	1532.00
							10850.72	8556.73	1532.00
							10816.93	8592.76	1532.00
							10811.24	8602.07	1532.00
							10815.20	8614.31	1532.00
							10826.15	8630.32	1532.00
							10967.43	8768.90	1532.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
c1545					1545.00		10979.11	8077.73	1545.00
							11009.45	8088.07	1545.00
							11001.52	8142.20	1545.00
							11020.48	8169.44	1545.00
							11013.10	8195.94	1545.00
							10863.68	8342.35	1545.00
							10875.18	8356.85	1545.00
							10827.83	8398.18	1545.00
							10821.75	8417.72	1545.00
							10787.21	8458.78	1545.00
							10776.57	8494.40	1545.00
							10731.96	8536.27	1545.00
							10721.84	8556.24	1545.00
							10722.93	8577.59	1545.00
							10729.23	8595.93	1545.00
							10724.85	8605.50	1545.00
							10730.87	8618.09	1545.00
							10788.89	8678.84	1545.00
							10853.88	8740.05	1545.00
							10985.29	8871.02	1545.00
							10999.84	8881.88	1545.00
							11009.40	8883.62	1545.00
							11033.73	8881.01	1545.00
							11047.41	8871.89	1545.00
							11148.61	8785.17	1545.00
							11176.88	8783.79	1545.00
							11231.36	8752.25	1545.00
							11271.76	8715.10	1545.00
							11396.00	8589.56	1545.00
							11553.58	8424.74	1545.00
c1545					1545.00		11171.51	8946.86	1545.00
							11123.24	8985.31	1545.00
							11109.28	8977.20	1545.00
							11127.34	8946.14	1545.00
							11137.53	8921.03	1545.00
							11148.99	8894.64	1545.00
							11154.37	8887.74	1545.00
							11195.92	8856.54	1545.00
							11220.55	8833.00	1545.00
							11268.03	8784.15	1545.00
							11328.03	8718.47	1545.00
							11397.13	8631.85	1545.00
							11432.84	8588.20	1545.00
							11445.57	8589.29	1545.00
							11480.22	8553.78	1545.00
							11583.40	8440.20	1545.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11725.99	8261.76	1545.00
							11700.85	8258.79	1545.00
							11553.58	8424.74	1545.00
c1531					1531.00		10973.42	8409.12	1531.00
							11206.61	8654.63	1531.00
c1535					1535.00		11700.85	8107.58	1535.00
							11576.71	8262.06	1535.00
							11463.13	8395.07	1535.00
							11365.97	8504.00	1535.00
							11212.98	8666.57	1535.00
							11203.12	8667.12	1535.00
							10962.43	8416.43	1535.00
							10961.40	8402.64	1535.00
							11186.02	8186.71	1535.00
							11453.95	7936.36	1535.00
							11512.92	7886.36	1535.00
							11530.85	7916.02	1535.00
							11588.44	7897.74	1535.00
							11632.23	7899.12	1535.00
							11651.54	7899.81	1535.00
							11713.27	7957.05	1535.00
							11742.24	7993.26	1535.00
							11727.06	8045.68	1535.00
							11745.68	8050.85	1535.00
							11700.85	8107.58	1535.00
c1550					1550.00		11350.91	8590.33	1550.00
							11540.59	8373.83	1550.00
							11664.31	8226.58	1550.00
							11824.98	8024.58	1550.00
							11833.46	8008.98	1550.00
							11834.28	7996.66	1550.00
							11830.72	7984.07	1550.00
							11823.77	7974.29	1550.00
							11618.48	7764.65	1550.00
							11608.26	7760.52	1550.00
							11597.62	7761.83	1550.00
							11586.97	7770.52	1550.00
							11565.47	7773.78	1550.00
							11468.58	7859.15	1550.00
							11310.92	8006.14	1550.00
							11055.72	8246.50	1550.00
c1549					1549.00		11308.91	8631.00	1549.00
							11238.73	8707.04	1549.00
							11222.00	8714.62	1549.00
							11203.21	8715.49	1549.00
							11185.79	8708.76	1549.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11168.55	8693.07	1549.00
							10923.27	8434.76	1549.00
							10913.15	8413.96	1549.00
							10914.24	8391.79	1549.00
							10930.39	8367.15	1549.00
							11048.09	8257.39	1549.00
c1555					1555.00		11735.33	8160.32	1555.00
							11841.90	8028.07	1555.00
							11849.31	8012.72	1555.00
							11850.35	7994.44	1555.00
							11846.55	7980.30	1555.00
							11838.79	7967.72	1555.00
							11696.19	7822.53	1555.00
							11622.97	7746.71	1555.00
							11604.36	7740.55	1555.00
							11589.44	7740.55	1555.00
							11570.00	7745.20	1555.00
							11561.79	7749.31	1555.00
							11436.84	7870.29	1555.00
c1540					1540.00		11883.67	7902.60	1540.00
							11874.36	7904.06	1540.00
							11682.95	7710.05	1540.00
							11681.21	7702.88	1540.00
							11688.38	7693.32	1540.00
							11987.91	7402.93	1540.00
							12257.76	7133.08	1540.00
							12314.01	7076.56	1540.00
							12333.58	7075.74	1540.00
							12376.69	7035.09	1540.00
							12454.15	7113.08	1540.00
							12365.86	7247.59	1540.00
							12248.10	7427.06	1540.00
							12158.58	7551.33	1540.00
							12041.26	7702.77	1540.00
							11983.49	7776.41	1540.00
							11883.67	7902.60	1540.00
c1537					1537.00		11690.51	7704.43	1537.00
							11878.02	7895.23	1537.00
c1557					1557.00		12212.26	7556.40	1557.00
							12282.34	7456.48	1557.00
							12424.96	7246.52	1557.00
							12499.15	7132.91	1557.00
							12502.71	7116.48	1557.00
							12500.79	7099.51	1557.00
							12493.67	7084.73	1557.00
							12401.69	6990.01	1557.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							12384.53	6980.45	1557.00
							12376.71	6976.32	1557.00
							12363.02	6976.54	1557.00
							12348.24	6979.80	1557.00
							12336.07	6986.75	1557.00
							12127.05	7191.21	1557.00
							11976.26	7339.39	1557.00
c1556					1556.00		11935.43	7381.28	1556.00
							11639.05	7671.35	1556.00
							11630.58	7690.04	1556.00
							11628.19	7706.34	1556.00
							11632.43	7721.39	1556.00
							11639.83	7733.71	1556.00
							11689.91	7784.77	1556.00
							11851.56	7949.16	1556.00
							11866.76	7956.97	1556.00
							11883.05	7958.61	1556.00
							11903.99	7952.86	1556.00
							11917.27	7941.77	1556.00
							11965.45	7881.82	1556.00
							12185.99	7593.27	1556.00
c1556					1556.00		11184.07	7050.31	1556.00
							10934.81	7295.33	1556.00
							10926.60	7309.84	1556.00
							10923.72	7327.09	1556.00
							10925.78	7340.78	1556.00
							10934.47	7357.83	1556.00
							10953.44	7377.84	1556.00
							11164.19	7592.73	1556.00
							11392.51	7823.24	1556.00
							11403.46	7830.83	1556.00
							11415.36	7834.19	1556.00
							11427.86	7834.79	1556.00
							11441.33	7831.64	1556.00
							11453.39	7825.78	1556.00
							11463.93	7816.11	1556.00
							11830.07	7456.06	1556.00
							11838.32	7442.47	1556.00
							11841.80	7427.37	1556.00
							11841.04	7415.53	1556.00
							11837.56	7402.17	1556.00
							11830.83	7392.06	1556.00
							11421.40	6975.22	1556.00
							11409.15	6966.42	1556.00
							11397.94	6962.80	1556.00
							11386.04	6961.59	1556.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11373.79	6963.14	1556.00
							11365.17	6966.42	1556.00
							11191.15	7044.55	1556.00
							11184.07	7050.31	1556.00
c1537					1537.00		11395.18	7030.03	1537.00
							11320.21	7062.95	1537.00
							11299.35	7058.50	1537.00
							11222.15	7092.86	1537.00
							10983.97	7326.72	1537.00
							11193.96	7540.82	1537.00
							11422.70	7773.39	1537.00
							11425.43	7773.52	1537.00
							11780.50	7424.11	1537.00
							11562.30	7201.53	1537.00
							11395.18	7030.03	1537.00
c1550					1550.00		8968.61	6326.41	1550.00
							8968.61	8210.05	1550.00
							9703.67	9023.56	1550.00
							10409.81	8341.46	1550.00
							10594.70	7824.04	1550.00
							10782.35	7348.01	1550.00
							9927.04	7257.62	1550.00
							9645.42	6318.86	1550.00
							8968.61	6326.41	1550.00
c1555					1555.00		10780.03	7146.88	1555.00
							11453.55	6897.18	1555.00
							11600.30	6833.66	1555.00

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 27 May 2026

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (NONE)	
Strictly acc. to AzB	

Receivers

Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
				Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
				(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R6				62.0	-70.9	0.0	0.0		x	Total	5.00	r	-15017.24	-10621.17	1559.61
R7				59.0	-72.6	0.0	0.0		x	Total	5.00	r	-14110.54	-4719.17	1558.82
R8				71.4	-63.6	0.0	0.0		x	Total	5.00	r	-14301.88	842.10	1558.85
R9				69.7	-65.0	0.0	0.0		x	Total	5.00	r	-14419.73	3938.07	1558.87
R10				71.0	-63.8	0.0	0.0		x	Total	5.00	r	-14335.70	14574.29	1558.85
R11				72.3	-65.7	0.0	0.0		x	Total	5.00	r	-18077.26	17791.75	1559.47
R12				72.3	-67.1	0.0	0.0		x	Total	5.00	r	-11087.35	15427.99	1558.32
R13				66.5	-71.0	0.0	0.0		x	Total	5.00	r	-1988.42	12898.06	1556.81
R14				72.0	-66.7	0.0	0.0		x	Total	5.00	r	2781.09	8451.26	1556.02
R15				71.6	-67.0	0.0	0.0		x	Total	5.00	r	3562.10	7767.28	1555.89
R16				71.5	-66.7	0.0	0.0		x	Total	5.00	r	5533.70	7521.24	1555.57
R17				66.7	-66.8	0.0	0.0		x	Total	5.00	r	16788.17	2288.85	1561.47
R18				73.2	-65.3	0.0	0.0		x	Total	5.00	r	15995.33	-1499.56	1557.13
R19				70.0	-66.3	0.0	0.0		x	Total	5.00	r	17647.07	-4260.59	1557.88
R20				72.3	-64.6	0.0	0.0		x	Total	5.00	r	20527.08	-7020.29	1558.63
R21				68.6	-67.5	0.0	0.0		x	Total	5.00	r	23277.79	-8239.42	1558.96

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflec	
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)
Ramona (w/o Warren)				70.8	0.0	0.0			1561.0	0.0	0.0	8.5	0.0	0.0	55		4.27	0.0	1	0.0	0.0	
Ramona (w/o Warren)				70.8	0.0	0.0			1561.0	0.0	0.0	8.5	0.0	0.0	55		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				72.8	0.0	0.0			1667.0	0.0	0.0	8.5	0.0	0.0	65		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				72.8	0.0	0.0			1667.0	0.0	0.0	8.5	0.0	0.0	65		23	0.0	1	0.0	0.0	
Ramona (b/w Lyon and State)				71.6	0.0	0.0			1864.0	0.0	0.0	8.5	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.1	0.0	0.0			1646.0	0.0	0.0	8.5	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.1	0.0	0.0			1646.0	0.0	0.0	8.5	0.0	0.0	55		16	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.1	0.0	0.0			1646.0	0.0	0.0	8.5	0.0	0.0	55		8	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				69.1	0.0	0.0			1291.0	0.0	0.0	8.5	0.0	0.0	50		9	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				69.1	0.0	0.0			1291.0	0.0	0.0	8.5	0.0	0.0	50		17.6	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.4	0.0	0.0			813.0	0.0	0.0	5.0	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.4	0.0	0.0			813.0	0.0	0.0	5.0	0.0	0.0	55		13.5	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.4	0.0	0.0			813.0	0.0	0.0	5.0	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (s/o Esplanade)				68.1	0.0	0.0			958.0	0.0	0.0	5.0	0.0	0.0	55		4.88	0.0	1	0.0	0.0	
Lake Park Drive				66.6	0.0	0.0			845.0	0.0	0.0	5.0	0.0	0.0	50		12.5	0.0	1	0.0	0.0	

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-20114.14	19276.81	1554.81	1554.81		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-15553.43	15804.25	1554.06	1554.06		
					-15412.58	15698.18	1554.03	1554.03		
					-15209.13	15578.20	1554.00	1554.00		
					-15028.29	15489.52	1553.97	1553.97		
					-14846.58	15429.53	1553.94	1553.94		
					-14690.08	15389.97	1553.91	1553.91		
					-14615.74	15376.93	1553.90	1553.90		
					-14528.80	15366.06	1553.89	1553.89		
					-14418.39	15356.05	1553.87	1553.87		
					-14366.63	15355.71	1553.86	1553.86		
Ramona (b/w Warren and Lyon)	0.00	r			-14366.63	15355.71	1553.86	1553.86		
					-14150.14	15353.10	1553.82	1553.82		
					-12919.14	15364.88	1553.62	1553.62		
					-12150.97	15356.18	1553.49	1553.49		
					-11122.88	15362.21	1553.32	1553.32		
					-7208.62	15387.05	1552.68	1552.68		
					-5413.14	15394.72	1552.38	1552.38		
					-5218.15	15384.86	1552.35	1552.35		
Ramona (b/w Warren and Lyon)	0.00	r			-5218.15	15384.86	1552.35	1552.35		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					-4928.30	15335.17	1552.30	1552.30		
					-4592.91	15244.08	1552.24	1552.24		
					-4265.79	15104.67	1552.19	1552.19		
					-3999.41	14965.27	1552.14	1552.14		
					-3753.73	14794.12	1552.10	1552.10		
					-3541.20	14621.03	1552.07	1552.07		
					-2967.16	14051.38	1551.97	1551.97		
					-1348.14	12448.91	1551.71	1551.71		
					389.99	10723.27	1551.42	1551.42		
Ramona (b/w Lyon and State)	0.00	r			389.99	10723.27	1551.42	1551.42		
					2271.35	8855.71	1551.11	1551.11		
					3192.20	7941.82	1550.96	1550.96		
					3255.74	7889.24	1550.94	1550.94		
					3411.72	7770.53	1550.92	1550.92		
					3486.25	7724.29	1550.91	1550.91		
					3577.35	7671.84	1550.89	1550.89		
					3655.34	7629.74	1550.88	1550.88		
					3793.38	7570.38	1550.86	1550.86		
					3890.00	7535.19	1550.84	1550.84		
					3999.04	7502.75	1550.82	1550.82		
					4130.17	7472.38	1550.80	1550.80		
					4269.30	7446.73	1550.78	1550.78		
					4354.52	7444.56	1550.76	1550.76		
Ramona (b/w State and Esplanade)	0.00	r			4354.52	7444.56	1550.76	1550.76		
					5210.33	7445.94	1550.62	1550.62		
					5605.98	7450.28	1550.56	1550.56		
					5783.80	7448.11	1550.53	1550.53		
					6050.39	7447.67	1550.48	1550.48		
Ramona (b/w State and Esplanade)	0.00	r			6050.39	7447.67	1550.48	1550.48		
					6933.89	7447.67	1550.34	1550.34		
					7518.48	7441.46	1550.24	1550.24		
					7719.33	7426.97	1550.21	1550.21		
					8554.46	7275.12	1550.07	1550.07		
					8858.84	7221.98	1550.02	1550.02		
					9018.97	7207.48	1550.00	1550.00		
					9295.04	7195.75	1550.00	1550.00		
					10032.47	7190.53	1550.71	1550.71		
					10328.13	7154.01	1552.44	1552.44		
					10587.27	7107.05	1553.98	1553.98		
					10902.07	7018.35	1554.67	1554.67		
					11256.86	6880.95	1554.64	1554.64		
					11583.83	6719.21	1554.75	1554.75		
					11879.50	6529.64	1555.01	1555.01		
					12270.15	6208.00	1555.23	1555.23		
					12622.16	5854.62	1555.29	1555.29		
					13378.62	5103.67	1555.46	1555.46		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					13750.04	4485.73	1555.04	1555.04		
Ramona (b/w State and Esplanade)	0.00	r			13750.04	4485.73	1555.04	1555.04		
					14668.38	2384.70	1553.00	1553.00		
					14744.90	2165.55	1552.74	1552.74		
					14807.52	1915.10	1552.40	1552.40		
					14852.74	1525.50	1551.77	1551.77		
					14866.54	1339.14	1551.45	1551.45		
					14913.48	1069.95	1551.43	1551.43		
					14965.94	905.67	1551.47	1551.47		
					15136.86	546.29	1551.57	1551.57		
					15660.60	-391.61	1551.83	1551.83		
					15765.78	-581.16	1551.88	1551.88		
					15832.62	-725.79	1551.92	1551.92		
					15867.68	-821.12	1551.95	1551.95		
					15907.12	-940.54	1551.98	1551.98		
					15944.38	-1068.74	1552.01	1552.01		
					15993.95	-1268.76	1552.07	1552.07		
					16024.38	-1420.95	1552.11	1552.11		
					16051.34	-1585.31	1552.15	1552.15		
					16065.26	-1678.36	1552.18	1552.18		
					16083.20	-1877.15	1552.23	1552.23		
					16099.77	-2129.78	1552.30	1552.30		
					16123.24	-2567.40	1552.42	1552.42		
					16163.27	-2731.67	1552.47	1552.47		
					16259.91	-2919.42	1552.52	1552.52		
					16393.81	-3086.46	1552.56	1552.56		
					17143.46	-3839.58	1552.77	1552.77		
					17351.62	-4038.98	1552.82	1552.82		
Ramona (s/o Esplanade)	0.00	r			17351.62	-4038.98	1552.82	1552.82		
					18202.18	-4879.68	1553.05	1553.05		
					19192.36	-5857.42	1553.32	1553.32		
					20076.91	-6715.67	1553.55	1553.55		
					20187.62	-6805.56	1553.57	1553.57		
					20306.00	-6885.57	1553.60	1553.60		
					20410.96	-6942.88	1553.61	1553.61		
					20521.44	-6980.86	1553.62	1553.62		
					20609.82	-7003.65	1553.63	1553.63		
					20788.66	-7009.17	1553.63	1553.63		
					21487.26	-7013.52	1553.63	1553.63		
					22163.97	-7019.74	1553.63	1553.63		
					22272.38	-7037.69	1553.64	1553.64		
					22474.06	-7152.78	1553.67	1553.67		
					22652.73	-7282.12	1553.70	1553.70		
					22802.90	-7438.87	1553.75	1553.75		
Ramona (s/o Esplanade)	0.00	r			22802.90	-7438.87	1553.75	1553.75		
					22916.90	-7564.38	1553.78	1553.78		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					22987.60	-7653.72	1553.81	1553.80		
					23053.92	-7735.93	1553.83	1553.83		
					23114.82	-7823.80	1553.85	1553.85		
					23176.59	-7915.15	1553.88	1553.88		
					23235.75	-8009.99	1553.90	1553.90		
					23281.00	-8090.90	1553.92	1553.92		
					23350.60	-8225.75	1553.96	1553.96		
					23444.56	-8445.00	1554.02	1554.02		
					23528.95	-8653.80	1554.08	1554.08		
					23637.71	-8913.94	1554.15	1554.15		
Warren (n/o Esplanade)	0.00	r			-14372.66	15355.71	1553.86	1553.86		
					-14371.85	15284.39	1553.86	1553.86		
					-14367.94	14858.20	1553.86	1553.86		
					-14363.01	14078.51	1553.86	1553.86		
					-14371.77	6054.66	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14371.77	6054.66	1553.86	1553.86		
					-14380.06	4998.40	1553.86	1553.86		
					-14379.19	4499.12	1553.86	1553.86		
					-14370.49	3572.76	1553.86	1553.86		
					-14351.35	2207.12	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14351.35	2207.12	1553.86	1553.86		
					-14334.91	1239.95	1553.85	1553.85		
					-14325.05	296.89	1553.85	1553.85		
					-14286.39	-3112.34	1553.85	1553.85		
Warren (s/o Esplanade)	0.00	r			-14286.39	-3112.34	1553.85	1553.85		
					-14272.04	-4409.31	1553.84	1553.84		
					-14274.23	-4613.16	1553.84	1553.84		
					-14276.97	-4689.88	1553.84	1553.84		
					-14284.64	-4774.27	1553.85	1553.85		
					-14298.89	-4887.15	1553.85	1553.85		
					-14327.38	-5024.15	1553.85	1553.85		
					-14401.95	-5335.53	1553.87	1553.86		
					-14500.58	-5736.65	1553.88	1553.88		
					-15144.30	-8372.40	1554.00	1554.00		
					-15157.42	-9740.15	1554.37	1554.37		
					-15153.96	-9887.90	1554.41	1554.41		
					-15140.48	-10178.01	1554.49	1554.49		
					-15123.91	-11181.92	1554.77	1554.77		
					-15111.85	-11371.53	1554.82	1554.82		
					-15096.51	-11483.33	1554.85	1554.85		
					-15052.67	-11649.92	1554.89	1554.89		
Lake Park Drive	0.00	r			14928.73	1048.11	1551.44	1551.44		
					15075.72	1120.30	1551.47	1551.47		
					15831.82	1604.64	1553.94	1553.94		
					16321.93	1975.68	1555.69	1555.69		
					16765.12	2344.99	1556.47	1556.47		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					17211.66	2726.34	1556.42	1556.42		
					17996.26	3392.59	1556.32	1556.32		

Terrain Contours

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
cLimits					1555.00		-21264.86	23955.86	1555.00
							28735.14	23955.86	1555.00
							28735.14	-12044.14	1555.00
							-21264.86	-12044.14	1555.00
							-21264.86	23955.86	1555.00
c1545					1545.00		10772.57	8633.64	1545.00
							10764.75	8620.39	1545.00
							10764.97	8605.19	1545.00
							10775.83	8587.82	1545.00
							10816.23	8546.99	1545.00
							10817.96	8533.09	1545.00
							10809.49	8511.15	1545.00
							10806.67	8496.38	1545.00
							10811.87	8487.08	1545.00
							10875.63	8434.54	1545.00
							10880.82	8437.01	1545.00
							11076.72	8641.16	1545.00
							11154.47	8725.21	1545.00
							11155.68	8735.03	1545.00
							11152.40	8743.13	1545.00
							11116.03	8782.95	1545.00
							11071.56	8820.01	1545.00
							11040.29	8844.99	1545.00
							11016.39	8853.90	1545.00
							10999.24	8851.29	1545.00
							10982.51	8840.65	1545.00
							10772.57	8633.64	1545.00
c1540					1540.00		10788.30	8627.47	1540.00
							10984.64	8818.60	1540.00
							10998.32	8821.20	1540.00
							11025.47	8810.56	1540.00
							11050.01	8798.18	1540.00
							11097.14	8779.29	1540.00
							11135.93	8738.95	1540.00
							11136.27	8731.19	1540.00
							11122.48	8712.40	1540.00
							10882.92	8460.68	1540.00
							10873.48	8455.89	1540.00
							10839.28	8482.85	1540.00
							10826.28	8496.12	1540.00
							10825.19	8504.19	1540.00
							10836.13	8533.06	1540.00
							10835.58	8541.00	1540.00
							10830.24	8549.61	1540.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							10787.69	8593.53	1540.00
							10783.31	8603.39	1540.00
							10782.08	8614.33	1540.00
							10788.30	8627.47	1540.00
c1535					1535.00		11115.66	8727.93	1535.00
							11117.50	8732.79	1535.00
							11116.48	8739.01	1535.00
							11086.29	8768.77	1535.00
							11043.39	8776.80	1535.00
							11006.58	8779.84	1535.00
							10985.40	8787.66	1535.00
							10969.87	8784.95	1535.00
							10813.00	8630.32	1535.00
							10800.27	8612.39	1535.00
							10800.00	8602.68	1535.00
							10805.06	8592.55	1535.00
							10844.74	8552.05	1535.00
							10849.95	8542.50	1535.00
							10851.36	8534.35	1535.00
							10849.41	8523.16	1535.00
							10842.79	8507.31	1535.00
							10843.87	8499.82	1535.00
							10871.92	8475.32	1535.00
							10877.26	8476.56	1535.00
							11115.66	8727.93	1535.00
c1532 (Pond 1A Bottom)					1532.00		10967.43	8768.90	1532.00
							10973.95	8771.07	1532.00
							10998.27	8762.60	1532.00
							11071.47	8763.47	1532.00
							11081.35	8760.43	1532.00
							11105.46	8738.16	1532.00
							11105.90	8729.80	1532.00
							10881.09	8492.83	1532.00
							10874.66	8489.96	1532.00
							10867.41	8491.06	1532.00
							10855.37	8501.59	1532.00
							10853.32	8508.02	1532.00
							10858.79	8524.03	1532.00
							10860.29	8536.21	1532.00
							10857.42	8547.57	1532.00
							10850.72	8556.73	1532.00
							10816.93	8592.76	1532.00
							10811.24	8602.07	1532.00
							10815.20	8614.31	1532.00
							10826.15	8630.32	1532.00
							10967.43	8768.90	1532.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
c1545					1545.00		10979.11	8077.73	1545.00
							11009.45	8088.07	1545.00
							11001.52	8142.20	1545.00
							11020.48	8169.44	1545.00
							11013.10	8195.94	1545.00
							10863.68	8342.35	1545.00
							10875.18	8356.85	1545.00
							10827.83	8398.18	1545.00
							10821.75	8417.72	1545.00
							10787.21	8458.78	1545.00
							10776.57	8494.40	1545.00
							10731.96	8536.27	1545.00
							10721.84	8556.24	1545.00
							10722.93	8577.59	1545.00
							10729.23	8595.93	1545.00
							10724.85	8605.50	1545.00
							10730.87	8618.09	1545.00
							10788.89	8678.84	1545.00
							10853.88	8740.05	1545.00
							10985.29	8871.02	1545.00
							10999.84	8881.88	1545.00
							11009.40	8883.62	1545.00
							11033.73	8881.01	1545.00
							11047.41	8871.89	1545.00
							11148.61	8785.17	1545.00
							11176.88	8783.79	1545.00
							11231.36	8752.25	1545.00
							11271.76	8715.10	1545.00
							11396.00	8589.56	1545.00
							11553.58	8424.74	1545.00
c1545					1545.00		11171.51	8946.86	1545.00
							11123.24	8985.31	1545.00
							11109.28	8977.20	1545.00
							11127.34	8946.14	1545.00
							11137.53	8921.03	1545.00
							11148.99	8894.64	1545.00
							11154.37	8887.74	1545.00
							11195.92	8856.54	1545.00
							11220.55	8833.00	1545.00
							11268.03	8784.15	1545.00
							11328.03	8718.47	1545.00
							11397.13	8631.85	1545.00
							11432.84	8588.20	1545.00
							11445.57	8589.29	1545.00
							11480.22	8553.78	1545.00
							11583.40	8440.20	1545.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11725.99	8261.76	1545.00
							11700.85	8258.79	1545.00
							11553.58	8424.74	1545.00
c1531					1531.00		10973.42	8409.12	1531.00
							11206.61	8654.63	1531.00
c1535					1535.00		11700.85	8107.58	1535.00
							11576.71	8262.06	1535.00
							11463.13	8395.07	1535.00
							11365.97	8504.00	1535.00
							11212.98	8666.57	1535.00
							11203.12	8667.12	1535.00
							10962.43	8416.43	1535.00
							10961.40	8402.64	1535.00
							11186.02	8186.71	1535.00
							11453.95	7936.36	1535.00
							11512.92	7886.36	1535.00
							11530.85	7916.02	1535.00
							11588.44	7897.74	1535.00
							11632.23	7899.12	1535.00
							11651.54	7899.81	1535.00
							11713.27	7957.05	1535.00
							11742.24	7993.26	1535.00
							11727.06	8045.68	1535.00
							11745.68	8050.85	1535.00
							11700.85	8107.58	1535.00
c1550					1550.00		11350.91	8590.33	1550.00
							11540.59	8373.83	1550.00
							11664.31	8226.58	1550.00
							11824.98	8024.58	1550.00
							11833.46	8008.98	1550.00
							11834.28	7996.66	1550.00
							11830.72	7984.07	1550.00
							11823.77	7974.29	1550.00
							11618.48	7764.65	1550.00
							11608.26	7760.52	1550.00
							11597.62	7761.83	1550.00
							11586.97	7770.52	1550.00
							11565.47	7773.78	1550.00
							11468.58	7859.15	1550.00
							11310.92	8006.14	1550.00
							11055.72	8246.50	1550.00
c1549					1549.00		11308.91	8631.00	1549.00
							11238.73	8707.04	1549.00
							11222.00	8714.62	1549.00
							11203.21	8715.49	1549.00
							11185.79	8708.76	1549.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11168.55	8693.07	1549.00
							10923.27	8434.76	1549.00
							10913.15	8413.96	1549.00
							10914.24	8391.79	1549.00
							10930.39	8367.15	1549.00
							11048.09	8257.39	1549.00
c1555					1555.00		11735.33	8160.32	1555.00
							11841.90	8028.07	1555.00
							11849.31	8012.72	1555.00
							11850.35	7994.44	1555.00
							11846.55	7980.30	1555.00
							11838.79	7967.72	1555.00
							11696.19	7822.53	1555.00
							11622.97	7746.71	1555.00
							11604.36	7740.55	1555.00
							11589.44	7740.55	1555.00
							11570.00	7745.20	1555.00
							11561.79	7749.31	1555.00
							11436.84	7870.29	1555.00
c1540					1540.00		11883.67	7902.60	1540.00
							11874.36	7904.06	1540.00
							11682.95	7710.05	1540.00
							11681.21	7702.88	1540.00
							11688.38	7693.32	1540.00
							11987.91	7402.93	1540.00
							12257.76	7133.08	1540.00
							12314.01	7076.56	1540.00
							12333.58	7075.74	1540.00
							12376.69	7035.09	1540.00
							12454.15	7113.08	1540.00
							12365.86	7247.59	1540.00
							12248.10	7427.06	1540.00
							12158.58	7551.33	1540.00
							12041.26	7702.77	1540.00
							11983.49	7776.41	1540.00
							11883.67	7902.60	1540.00
c1537					1537.00		11690.51	7704.43	1537.00
							11878.02	7895.23	1537.00
c1557					1557.00		12212.26	7556.40	1557.00
							12282.34	7456.48	1557.00
							12424.96	7246.52	1557.00
							12499.15	7132.91	1557.00
							12502.71	7116.48	1557.00
							12500.79	7099.51	1557.00
							12493.67	7084.73	1557.00
							12401.69	6990.01	1557.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							12384.53	6980.45	1557.00
							12376.71	6976.32	1557.00
							12363.02	6976.54	1557.00
							12348.24	6979.80	1557.00
							12336.07	6986.75	1557.00
							12127.05	7191.21	1557.00
							11976.26	7339.39	1557.00
c1556					1556.00		11935.43	7381.28	1556.00
							11639.05	7671.35	1556.00
							11630.58	7690.04	1556.00
							11628.19	7706.34	1556.00
							11632.43	7721.39	1556.00
							11639.83	7733.71	1556.00
							11689.91	7784.77	1556.00
							11851.56	7949.16	1556.00
							11866.76	7956.97	1556.00
							11883.05	7958.61	1556.00
							11903.99	7952.86	1556.00
							11917.27	7941.77	1556.00
							11965.45	7881.82	1556.00
							12185.99	7593.27	1556.00
c1556					1556.00		11184.07	7050.31	1556.00
							10934.81	7295.33	1556.00
							10926.60	7309.84	1556.00
							10923.72	7327.09	1556.00
							10925.78	7340.78	1556.00
							10934.47	7357.83	1556.00
							10953.44	7377.84	1556.00
							11164.19	7592.73	1556.00
							11392.51	7823.24	1556.00
							11403.46	7830.83	1556.00
							11415.36	7834.19	1556.00
							11427.86	7834.79	1556.00
							11441.33	7831.64	1556.00
							11453.39	7825.78	1556.00
							11463.93	7816.11	1556.00
							11830.07	7456.06	1556.00
							11838.32	7442.47	1556.00
							11841.80	7427.37	1556.00
							11841.04	7415.53	1556.00
							11837.56	7402.17	1556.00
							11830.83	7392.06	1556.00
							11421.40	6975.22	1556.00
							11409.15	6966.42	1556.00
							11397.94	6962.80	1556.00
							11386.04	6961.59	1556.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11373.79	6963.14	1556.00
							11365.17	6966.42	1556.00
							11191.15	7044.55	1556.00
							11184.07	7050.31	1556.00
c1537					1537.00		11395.18	7030.03	1537.00
							11320.21	7062.95	1537.00
							11299.35	7058.50	1537.00
							11222.15	7092.86	1537.00
							10983.97	7326.72	1537.00
							11193.96	7540.82	1537.00
							11422.70	7773.39	1537.00
							11425.43	7773.52	1537.00
							11780.50	7424.11	1537.00
							11562.30	7201.53	1537.00
							11395.18	7030.03	1537.00
c1550					1550.00		8968.61	6326.41	1550.00
							8968.61	8210.05	1550.00
							9703.67	9023.56	1550.00
							10409.81	8341.46	1550.00
							10594.70	7824.04	1550.00
							10782.35	7348.01	1550.00
							9927.04	7257.62	1550.00
							9645.42	6318.86	1550.00
							8968.61	6326.41	1550.00
c1555					1555.00		10780.03	7146.88	1555.00
							11453.55	6897.18	1555.00
							11600.30	6833.66	1555.00

Eilar Associates, Inc.
210 South Juniper Street, Suite 100
Escondido, California 92025-4230
Phone: (760) 738-5570

Date: 07 Jul 2026

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.68
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.84
Min. Length of Section (ft)	3.28
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (NONE)	
Strictly acc. to AzB	

Receivers

Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
				Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
				(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R6				62.3	-70.9	0.0	0.0		x	Total	5.00	r	-15017.24	-10621.17	1559.61
R7				59.4	-72.6	0.0	0.0		x	Total	5.00	r	-14110.54	-4719.17	1558.82
R8				71.7	-63.6	0.0	0.0		x	Total	5.00	r	-14301.88	842.10	1558.85
R9				70.1	-65.0	0.0	0.0		x	Total	5.00	r	-14419.73	3938.07	1558.87
R10				71.4	-63.8	0.0	0.0		x	Total	5.00	r	-14335.70	14574.29	1558.85
R11				72.5	-65.7	0.0	0.0		x	Total	5.00	r	-18077.26	17791.75	1559.47
R12				72.5	-67.1	0.0	0.0		x	Total	5.00	r	-11087.35	15427.99	1558.32
R13				66.6	-71.0	0.0	0.0		x	Total	5.00	r	-1988.42	12898.06	1556.81
R14				72.1	-66.7	0.0	0.0		x	Total	5.00	r	2781.09	8451.26	1556.02
R15				71.7	-67.0	0.0	0.0		x	Total	5.00	r	3562.10	7767.28	1555.89
R16				71.7	-66.7	0.0	0.0		x	Total	5.00	r	5533.70	7521.24	1555.57
R17				67.1	-66.8	0.0	0.0		x	Total	5.00	r	16788.17	2288.85	1561.47
R18				73.3	-65.3	0.0	0.0		x	Total	5.00	r	15995.33	-1499.56	1557.13
R19				70.2	-66.3	0.0	0.0		x	Total	5.00	r	17647.07	-4260.59	1557.88
R20				72.5	-64.6	0.0	0.0		x	Total	5.00	r	20527.08	-7020.29	1558.63
R21				68.8	-67.5	0.0	0.0		x	Total	5.00	r	23277.79	-8239.42	1558.96

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflec	
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)
Ramona (w/o Warren)				71.0	0.0	0.0			1568.0	0.0	0.0	8.9	0.0	0.0	55		4.27	0.0	1	0.0	0.0	
Ramona (w/o Warren)				71.0	0.0	0.0			1568.0	0.0	0.0	8.9	0.0	0.0	55		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				72.9	0.0	0.0			1674.0	0.0	0.0	8.9	0.0	0.0	65		16.5	0.0	1	0.0	0.0	
Ramona (b/w Warren and Lyon)				72.9	0.0	0.0			1674.0	0.0	0.0	8.9	0.0	0.0	65		23	0.0	1	0.0	0.0	
Ramona (b/w Lyon and State)				71.7	0.0	0.0			1871.0	0.0	0.0	8.8	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.2	0.0	0.0			1653.0	0.0	0.0	8.9	0.0	0.0	55		24	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.2	0.0	0.0			1653.0	0.0	0.0	8.9	0.0	0.0	55		16	0.0	1	0.0	0.0	
Ramona (b/w State and Esplanade)				71.2	0.0	0.0			1653.0	0.0	0.0	8.9	0.0	0.0	55		8	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				69.3	0.0	0.0			1298.0	0.0	0.0	9.0	0.0	0.0	50		9	0.0	1	0.0	0.0	
Ramona (s/o Esplanade)				69.3	0.0	0.0			1298.0	0.0	0.0	9.0	0.0	0.0	50		17.6	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.7	0.0	0.0			820.0	0.0	0.0	5.8	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.7	0.0	0.0			820.0	0.0	0.0	5.8	0.0	0.0	55		13.5	0.0	1	0.0	0.0	
Warren (n/o Esplanade)				67.7	0.0	0.0			820.0	0.0	0.0	5.8	0.0	0.0	55		5.49	0.0	1	0.0	0.0	
Warren (s/o Esplanade)				68.3	0.0	0.0			965.0	0.0	0.0	5.7	0.0	0.0	55		4.88	0.0	1	0.0	0.0	
Lake Park Drive				66.9	0.0	0.0			852.0	0.0	0.0	5.8	0.0	0.0	50		12.5	0.0	1	0.0	0.0	

Geometry - Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-20114.14	19276.81	1554.81	1554.81		
Ramona (w/o Warren)	0.00	r			-16697.60	16698.03	1554.24	1554.24		
					-15553.43	15804.25	1554.06	1554.06		
					-15412.58	15698.18	1554.03	1554.03		
					-15209.13	15578.20	1554.00	1554.00		
					-15028.29	15489.52	1553.97	1553.97		
					-14846.58	15429.53	1553.94	1553.94		
					-14690.08	15389.97	1553.91	1553.91		
					-14615.74	15376.93	1553.90	1553.90		
					-14528.80	15366.06	1553.89	1553.89		
					-14418.39	15356.05	1553.87	1553.87		
					-14366.63	15355.71	1553.86	1553.86		
Ramona (b/w Warren and Lyon)	0.00	r			-14366.63	15355.71	1553.86	1553.86		
					-14150.14	15353.10	1553.82	1553.82		
					-12919.14	15364.88	1553.62	1553.62		
					-12150.97	15356.18	1553.49	1553.49		
					-11122.88	15362.21	1553.32	1553.32		
					-7208.62	15387.05	1552.68	1552.68		
					-5413.14	15394.72	1552.38	1552.38		
					-5218.15	15384.86	1552.35	1552.35		
Ramona (b/w Warren and Lyon)	0.00	r			-5218.15	15384.86	1552.35	1552.35		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					-4928.30	15335.17	1552.30	1552.30		
					-4592.91	15244.08	1552.24	1552.24		
					-4265.79	15104.67	1552.19	1552.19		
					-3999.41	14965.27	1552.14	1552.14		
					-3753.73	14794.12	1552.10	1552.10		
					-3541.20	14621.03	1552.07	1552.07		
					-2967.16	14051.38	1551.97	1551.97		
					-1348.14	12448.91	1551.71	1551.71		
					389.99	10723.27	1551.42	1551.42		
Ramona (b/w Lyon and State)	0.00	r			389.99	10723.27	1551.42	1551.42		
					2271.35	8855.71	1551.11	1551.11		
					3192.20	7941.82	1550.96	1550.96		
					3255.74	7889.24	1550.94	1550.94		
					3411.72	7770.53	1550.92	1550.92		
					3486.25	7724.29	1550.91	1550.91		
					3577.35	7671.84	1550.89	1550.89		
					3655.34	7629.74	1550.88	1550.88		
					3793.38	7570.38	1550.86	1550.86		
					3890.00	7535.19	1550.84	1550.84		
					3999.04	7502.75	1550.82	1550.82		
					4130.17	7472.38	1550.80	1550.80		
					4269.30	7446.73	1550.78	1550.78		
					4354.52	7444.56	1550.76	1550.76		
Ramona (b/w State and Esplanade)	0.00	r			4354.52	7444.56	1550.76	1550.76		
					5210.33	7445.94	1550.62	1550.62		
					5605.98	7450.28	1550.56	1550.56		
					5783.80	7448.11	1550.53	1550.53		
					6050.39	7447.67	1550.48	1550.48		
Ramona (b/w State and Esplanade)	0.00	r			6050.39	7447.67	1550.48	1550.48		
					6933.89	7447.67	1550.34	1550.34		
					7518.48	7441.46	1550.24	1550.24		
					7719.33	7426.97	1550.21	1550.21		
					8554.46	7275.12	1550.07	1550.07		
					8858.84	7221.98	1550.02	1550.02		
					9018.97	7207.48	1550.00	1550.00		
					9295.04	7195.75	1550.00	1550.00		
					10032.47	7190.53	1550.71	1550.71		
					10328.13	7154.01	1552.44	1552.44		
					10587.27	7107.05	1553.98	1553.98		
					10902.07	7018.35	1554.67	1554.67		
					11256.86	6880.95	1554.64	1554.64		
					11583.83	6719.21	1554.75	1554.75		
					11879.50	6529.64	1555.01	1555.01		
					12270.15	6208.00	1555.23	1555.23		
					12622.16	5854.62	1555.29	1555.29		
					13378.62	5103.67	1555.46	1555.46		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					13750.04	4485.73	1555.04	1555.04		
Ramona (b/w State and Esplanade)	0.00	r			13750.04	4485.73	1555.04	1555.04		
					14668.38	2384.70	1553.00	1553.00		
					14744.90	2165.55	1552.74	1552.74		
					14807.52	1915.10	1552.40	1552.40		
					14852.74	1525.50	1551.77	1551.77		
					14866.54	1339.14	1551.45	1551.45		
					14913.48	1069.95	1551.43	1551.43		
					14965.94	905.67	1551.47	1551.47		
					15136.86	546.29	1551.57	1551.57		
					15660.60	-391.61	1551.83	1551.83		
					15765.78	-581.16	1551.88	1551.88		
					15832.62	-725.79	1551.92	1551.92		
					15867.68	-821.12	1551.95	1551.95		
					15907.12	-940.54	1551.98	1551.98		
					15944.38	-1068.74	1552.01	1552.01		
					15993.95	-1268.76	1552.07	1552.07		
					16024.38	-1420.95	1552.11	1552.11		
					16051.34	-1585.31	1552.15	1552.15		
					16065.26	-1678.36	1552.18	1552.18		
					16083.20	-1877.15	1552.23	1552.23		
					16099.77	-2129.78	1552.30	1552.30		
					16123.24	-2567.40	1552.42	1552.42		
					16163.27	-2731.67	1552.47	1552.47		
					16259.91	-2919.42	1552.52	1552.52		
					16393.81	-3086.46	1552.56	1552.56		
					17143.46	-3839.58	1552.77	1552.77		
					17351.62	-4038.98	1552.82	1552.82		
Ramona (s/o Esplanade)	0.00	r			17351.62	-4038.98	1552.82	1552.82		
					18202.18	-4879.68	1553.05	1553.05		
					19192.36	-5857.42	1553.32	1553.32		
					20076.91	-6715.67	1553.55	1553.55		
					20187.62	-6805.56	1553.57	1553.57		
					20306.00	-6885.57	1553.60	1553.60		
					20410.96	-6942.88	1553.61	1553.61		
					20521.44	-6980.86	1553.62	1553.62		
					20609.82	-7003.65	1553.63	1553.63		
					20788.66	-7009.17	1553.63	1553.63		
					21487.26	-7013.52	1553.63	1553.63		
					22163.97	-7019.74	1553.63	1553.63		
					22272.38	-7037.69	1553.64	1553.64		
					22474.06	-7152.78	1553.67	1553.67		
					22652.73	-7282.12	1553.70	1553.70		
					22802.90	-7438.87	1553.75	1553.75		
Ramona (s/o Esplanade)	0.00	r			22802.90	-7438.87	1553.75	1553.75		
					22916.90	-7564.38	1553.78	1553.78		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					22987.60	-7653.72	1553.81	1553.80		
					23053.92	-7735.93	1553.83	1553.83		
					23114.82	-7823.80	1553.85	1553.85		
					23176.59	-7915.15	1553.88	1553.88		
					23235.75	-8009.99	1553.90	1553.90		
					23281.00	-8090.90	1553.92	1553.92		
					23350.60	-8225.75	1553.96	1553.96		
					23444.56	-8445.00	1554.02	1554.02		
					23528.95	-8653.80	1554.08	1554.08		
					23637.71	-8913.94	1554.15	1554.15		
Warren (n/o Esplanade)	0.00	r			-14372.66	15355.71	1553.86	1553.86		
					-14371.85	15284.39	1553.86	1553.86		
					-14367.94	14858.20	1553.86	1553.86		
					-14363.01	14078.51	1553.86	1553.86		
					-14371.77	6054.66	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14371.77	6054.66	1553.86	1553.86		
					-14380.06	4998.40	1553.86	1553.86		
					-14379.19	4499.12	1553.86	1553.86		
					-14370.49	3572.76	1553.86	1553.86		
					-14351.35	2207.12	1553.86	1553.86		
Warren (n/o Esplanade)	0.00	r			-14351.35	2207.12	1553.86	1553.86		
					-14334.91	1239.95	1553.85	1553.85		
					-14325.05	296.89	1553.85	1553.85		
					-14286.39	-3112.34	1553.85	1553.85		
Warren (s/o Esplanade)	0.00	r			-14286.39	-3112.34	1553.85	1553.85		
					-14272.04	-4409.31	1553.84	1553.84		
					-14274.23	-4613.16	1553.84	1553.84		
					-14276.97	-4689.88	1553.84	1553.84		
					-14284.64	-4774.27	1553.85	1553.85		
					-14298.89	-4887.15	1553.85	1553.85		
					-14327.38	-5024.15	1553.85	1553.85		
					-14401.95	-5335.53	1553.87	1553.86		
					-14500.58	-5736.65	1553.88	1553.88		
					-15144.30	-8372.40	1554.00	1554.00		
					-15157.42	-9740.15	1554.37	1554.37		
					-15153.96	-9887.90	1554.41	1554.41		
					-15140.48	-10178.01	1554.49	1554.49		
					-15123.91	-11181.92	1554.77	1554.77		
					-15111.85	-11371.53	1554.82	1554.82		
					-15096.51	-11483.33	1554.85	1554.85		
					-15052.67	-11649.92	1554.89	1554.89		
Lake Park Drive	0.00	r			14928.73	1048.11	1551.44	1551.44		
					15075.72	1120.30	1551.47	1551.47		
					15831.82	1604.64	1553.94	1553.94		
					16321.93	1975.68	1555.69	1555.69		
					16765.12	2344.99	1556.47	1556.47		

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
					17211.66	2726.34	1556.42	1556.42		
					17996.26	3392.59	1556.32	1556.32		

Terrain Contours

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
cLimits					1555.00		-21264.86	23955.86	1555.00
							28735.14	23955.86	1555.00
							28735.14	-12044.14	1555.00
							-21264.86	-12044.14	1555.00
							-21264.86	23955.86	1555.00
c1545					1545.00		10772.57	8633.64	1545.00
							10764.75	8620.39	1545.00
							10764.97	8605.19	1545.00
							10775.83	8587.82	1545.00
							10816.23	8546.99	1545.00
							10817.96	8533.09	1545.00
							10809.49	8511.15	1545.00
							10806.67	8496.38	1545.00
							10811.87	8487.08	1545.00
							10875.63	8434.54	1545.00
							10880.82	8437.01	1545.00
							11076.72	8641.16	1545.00
							11154.47	8725.21	1545.00
							11155.68	8735.03	1545.00
							11152.40	8743.13	1545.00
							11116.03	8782.95	1545.00
							11071.56	8820.01	1545.00
							11040.29	8844.99	1545.00
							11016.39	8853.90	1545.00
							10999.24	8851.29	1545.00
							10982.51	8840.65	1545.00
							10772.57	8633.64	1545.00
c1540					1540.00		10788.30	8627.47	1540.00
							10984.64	8818.60	1540.00
							10998.32	8821.20	1540.00
							11025.47	8810.56	1540.00
							11050.01	8798.18	1540.00
							11097.14	8779.29	1540.00
							11135.93	8738.95	1540.00
							11136.27	8731.19	1540.00
							11122.48	8712.40	1540.00
							10882.92	8460.68	1540.00
							10873.48	8455.89	1540.00
							10839.28	8482.85	1540.00
							10826.28	8496.12	1540.00
							10825.19	8504.19	1540.00
							10836.13	8533.06	1540.00
							10835.58	8541.00	1540.00
							10830.24	8549.61	1540.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							10787.69	8593.53	1540.00
							10783.31	8603.39	1540.00
							10782.08	8614.33	1540.00
							10788.30	8627.47	1540.00
c1535					1535.00		11115.66	8727.93	1535.00
							11117.50	8732.79	1535.00
							11116.48	8739.01	1535.00
							11086.29	8768.77	1535.00
							11043.39	8776.80	1535.00
							11006.58	8779.84	1535.00
							10985.40	8787.66	1535.00
							10969.87	8784.95	1535.00
							10813.00	8630.32	1535.00
							10800.27	8612.39	1535.00
							10800.00	8602.68	1535.00
							10805.06	8592.55	1535.00
							10844.74	8552.05	1535.00
							10849.95	8542.50	1535.00
							10851.36	8534.35	1535.00
							10849.41	8523.16	1535.00
							10842.79	8507.31	1535.00
							10843.87	8499.82	1535.00
							10871.92	8475.32	1535.00
							10877.26	8476.56	1535.00
							11115.66	8727.93	1535.00
c1532 (Pond 1A Bottom)					1532.00		10967.43	8768.90	1532.00
							10973.95	8771.07	1532.00
							10998.27	8762.60	1532.00
							11071.47	8763.47	1532.00
							11081.35	8760.43	1532.00
							11105.46	8738.16	1532.00
							11105.90	8729.80	1532.00
							10881.09	8492.83	1532.00
							10874.66	8489.96	1532.00
							10867.41	8491.06	1532.00
							10855.37	8501.59	1532.00
							10853.32	8508.02	1532.00
							10858.79	8524.03	1532.00
							10860.29	8536.21	1532.00
							10857.42	8547.57	1532.00
							10850.72	8556.73	1532.00
							10816.93	8592.76	1532.00
							10811.24	8602.07	1532.00
							10815.20	8614.31	1532.00
							10826.15	8630.32	1532.00
							10967.43	8768.90	1532.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
c1545					1545.00		10979.11	8077.73	1545.00
							11009.45	8088.07	1545.00
							11001.52	8142.20	1545.00
							11020.48	8169.44	1545.00
							11013.10	8195.94	1545.00
							10863.68	8342.35	1545.00
							10875.18	8356.85	1545.00
							10827.83	8398.18	1545.00
							10821.75	8417.72	1545.00
							10787.21	8458.78	1545.00
							10776.57	8494.40	1545.00
							10731.96	8536.27	1545.00
							10721.84	8556.24	1545.00
							10722.93	8577.59	1545.00
							10729.23	8595.93	1545.00
							10724.85	8605.50	1545.00
							10730.87	8618.09	1545.00
							10788.89	8678.84	1545.00
							10853.88	8740.05	1545.00
							10985.29	8871.02	1545.00
							10999.84	8881.88	1545.00
							11009.40	8883.62	1545.00
							11033.73	8881.01	1545.00
							11047.41	8871.89	1545.00
							11148.61	8785.17	1545.00
							11176.88	8783.79	1545.00
							11231.36	8752.25	1545.00
							11271.76	8715.10	1545.00
							11396.00	8589.56	1545.00
							11553.58	8424.74	1545.00
c1545					1545.00		11171.51	8946.86	1545.00
							11123.24	8985.31	1545.00
							11109.28	8977.20	1545.00
							11127.34	8946.14	1545.00
							11137.53	8921.03	1545.00
							11148.99	8894.64	1545.00
							11154.37	8887.74	1545.00
							11195.92	8856.54	1545.00
							11220.55	8833.00	1545.00
							11268.03	8784.15	1545.00
							11328.03	8718.47	1545.00
							11397.13	8631.85	1545.00
							11432.84	8588.20	1545.00
							11445.57	8589.29	1545.00
							11480.22	8553.78	1545.00
							11583.40	8440.20	1545.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11725.99	8261.76	1545.00
							11700.85	8258.79	1545.00
							11553.58	8424.74	1545.00
c1531					1531.00		10973.42	8409.12	1531.00
							11206.61	8654.63	1531.00
c1535					1535.00		11700.85	8107.58	1535.00
							11576.71	8262.06	1535.00
							11463.13	8395.07	1535.00
							11365.97	8504.00	1535.00
							11212.98	8666.57	1535.00
							11203.12	8667.12	1535.00
							10962.43	8416.43	1535.00
							10961.40	8402.64	1535.00
							11186.02	8186.71	1535.00
							11453.95	7936.36	1535.00
							11512.92	7886.36	1535.00
							11530.85	7916.02	1535.00
							11588.44	7897.74	1535.00
							11632.23	7899.12	1535.00
							11651.54	7899.81	1535.00
							11713.27	7957.05	1535.00
							11742.24	7993.26	1535.00
							11727.06	8045.68	1535.00
							11745.68	8050.85	1535.00
							11700.85	8107.58	1535.00
c1550					1550.00		11350.91	8590.33	1550.00
							11540.59	8373.83	1550.00
							11664.31	8226.58	1550.00
							11824.98	8024.58	1550.00
							11833.46	8008.98	1550.00
							11834.28	7996.66	1550.00
							11830.72	7984.07	1550.00
							11823.77	7974.29	1550.00
							11618.48	7764.65	1550.00
							11608.26	7760.52	1550.00
							11597.62	7761.83	1550.00
							11586.97	7770.52	1550.00
							11565.47	7773.78	1550.00
							11468.58	7859.15	1550.00
							11310.92	8006.14	1550.00
							11055.72	8246.50	1550.00
c1549					1549.00		11308.91	8631.00	1549.00
							11238.73	8707.04	1549.00
							11222.00	8714.62	1549.00
							11203.21	8715.49	1549.00
							11185.79	8708.76	1549.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11168.55	8693.07	1549.00
							10923.27	8434.76	1549.00
							10913.15	8413.96	1549.00
							10914.24	8391.79	1549.00
							10930.39	8367.15	1549.00
							11048.09	8257.39	1549.00
c1555					1555.00		11735.33	8160.32	1555.00
							11841.90	8028.07	1555.00
							11849.31	8012.72	1555.00
							11850.35	7994.44	1555.00
							11846.55	7980.30	1555.00
							11838.79	7967.72	1555.00
							11696.19	7822.53	1555.00
							11622.97	7746.71	1555.00
							11604.36	7740.55	1555.00
							11589.44	7740.55	1555.00
							11570.00	7745.20	1555.00
							11561.79	7749.31	1555.00
							11436.84	7870.29	1555.00
c1540					1540.00		11883.67	7902.60	1540.00
							11874.36	7904.06	1540.00
							11682.95	7710.05	1540.00
							11681.21	7702.88	1540.00
							11688.38	7693.32	1540.00
							11987.91	7402.93	1540.00
							12257.76	7133.08	1540.00
							12314.01	7076.56	1540.00
							12333.58	7075.74	1540.00
							12376.69	7035.09	1540.00
							12454.15	7113.08	1540.00
							12365.86	7247.59	1540.00
							12248.10	7427.06	1540.00
							12158.58	7551.33	1540.00
							12041.26	7702.77	1540.00
							11983.49	7776.41	1540.00
							11883.67	7902.60	1540.00
c1537					1537.00		11690.51	7704.43	1537.00
							11878.02	7895.23	1537.00
c1557					1557.00		12212.26	7556.40	1557.00
							12282.34	7456.48	1557.00
							12424.96	7246.52	1557.00
							12499.15	7132.91	1557.00
							12502.71	7116.48	1557.00
							12500.79	7099.51	1557.00
							12493.67	7084.73	1557.00
							12401.69	6990.01	1557.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							12384.53	6980.45	1557.00
							12376.71	6976.32	1557.00
							12363.02	6976.54	1557.00
							12348.24	6979.80	1557.00
							12336.07	6986.75	1557.00
							12127.05	7191.21	1557.00
							11976.26	7339.39	1557.00
c1556					1556.00		11935.43	7381.28	1556.00
							11639.05	7671.35	1556.00
							11630.58	7690.04	1556.00
							11628.19	7706.34	1556.00
							11632.43	7721.39	1556.00
							11639.83	7733.71	1556.00
							11689.91	7784.77	1556.00
							11851.56	7949.16	1556.00
							11866.76	7956.97	1556.00
							11883.05	7958.61	1556.00
							11903.99	7952.86	1556.00
							11917.27	7941.77	1556.00
							11965.45	7881.82	1556.00
							12185.99	7593.27	1556.00
c1556					1556.00		11184.07	7050.31	1556.00
							10934.81	7295.33	1556.00
							10926.60	7309.84	1556.00
							10923.72	7327.09	1556.00
							10925.78	7340.78	1556.00
							10934.47	7357.83	1556.00
							10953.44	7377.84	1556.00
							11164.19	7592.73	1556.00
							11392.51	7823.24	1556.00
							11403.46	7830.83	1556.00
							11415.36	7834.19	1556.00
							11427.86	7834.79	1556.00
							11441.33	7831.64	1556.00
							11453.39	7825.78	1556.00
							11463.93	7816.11	1556.00
							11830.07	7456.06	1556.00
							11838.32	7442.47	1556.00
							11841.80	7427.37	1556.00
							11841.04	7415.53	1556.00
							11837.56	7402.17	1556.00
							11830.83	7392.06	1556.00
							11421.40	6975.22	1556.00
							11409.15	6966.42	1556.00
							11397.94	6962.80	1556.00
							11386.04	6961.59	1556.00

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)
							11373.79	6963.14	1556.00
							11365.17	6966.42	1556.00
							11191.15	7044.55	1556.00
							11184.07	7050.31	1556.00
c1537					1537.00		11395.18	7030.03	1537.00
							11320.21	7062.95	1537.00
							11299.35	7058.50	1537.00
							11222.15	7092.86	1537.00
							10983.97	7326.72	1537.00
							11193.96	7540.82	1537.00
							11422.70	7773.39	1537.00
							11425.43	7773.52	1537.00
							11780.50	7424.11	1537.00
							11562.30	7201.53	1537.00
							11395.18	7030.03	1537.00
c1550					1550.00		8968.61	6326.41	1550.00
							8968.61	8210.05	1550.00
							9703.67	9023.56	1550.00
							10409.81	8341.46	1550.00
							10594.70	7824.04	1550.00
							10782.35	7348.01	1550.00
							9927.04	7257.62	1550.00
							9645.42	6318.86	1550.00
							8968.61	6326.41	1550.00
c1555					1555.00		10780.03	7146.88	1555.00
							11453.55	6897.18	1555.00
							11600.30	6833.66	1555.00