Appendix A

Geotechnical Report

TWINING

Engineering a Better Tomorrow

Update of Geotechnical Engineering Report

Conejo Canyon Bridge at Hill Canyon Treatment Plant
(CI 5527)
Thousand Oaks, California

Prepared for:
Stantec
111 East Victoria Street
Santa Barbara, CA 93101

January 30, 2019
Project No.: 181010.4

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January 30, 2019
Project No. 181010.4

Stantec
Attention: Hady Izadpanah
111 East Victoria Street
Santa Barbara, CA 93101

Subject: **Update of Geotechnical Engineering Report**
Conejo Canyon Bridge at Hill Canyon Treatment Plant (CI 5527)
Thousand Oaks, California

Dear Mr. Izadpanah:

In accordance with your request and authorization, we are presenting the results of our geotechnical study for the above-referenced project in Camarillo, California. The purpose of this investigation has been to evaluate the subsurface conditions at the site and to provide geotechnical engineering recommendations for the proposed project.

Please note that the recommendations presented within the report are based on assumptions stated herein. Should conditions encountered during development differ from those assumed in our analyses, or should the proposed development change, our recommendations may need to be modified accordingly. This report should be submitted to the appropriate authorities as part of the process of obtaining development permits for 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.

Jeff Tawakoli, PE 51883
Project Engineer

Larry D. Gurrola Ph.D., P.G. 7865
Project Geologist

Distribution: (4) Addressee

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1. INTRODUCTION

This report presents an update to the geotechnical engineering evaluation performed for the proposed bridge, which will be located southwest of the Hill Canyon Treatment Plant within the city limits of Thousand Oaks (Figure 1, Site Location Map). The original report was compiled in January of 2012. The purpose of this study has been to evaluate the subsurface conditions at the site by advancing additional borings closer to the abutment location and to update the original report with geotechnical recommendations related to the design and construction of the proposed project.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The project site is located southwest of the Hill Canyon Treatment Plant and consists of an unpaved access road on the north-facing hillside stream, vegetated slopes adjacent to the Arroyo Conejo Creek and plateau area to the north of the stream. The project site in general consists of hilly terrain on both sides of the proposed bridge, sloping gently towards the existing creek. Vegetation on site consists of mostly brush and mature trees, some of which burnt during the recent fire. The City of Thousand Oaks is proposing to install a prefabricated steel bridge over the stream to provide City employees with access to Hill Canyon Treatment Plant from Rancho Conejo Boulevard. The proposed bridge is to be located near the bend at the unpaved access road on the north-facing slope and will span over the stream to the northeast. The approximate area of the proposed bridge is shown on Figure 2 and Figure 2A, Boring Location Map.

We understand that the proposed bridge will consist of a single-span, prefabricated steel structure with abutments on both ends. The bridge will be subject to vehicle traffic and is to be designed for AASHTO HL-93 wheel loads. We have assumed the bridge will have abutment walls that are approximately 10-feet high and that fill will be placed for embankments.

3. SCOPE OF SERVICES

Our scope of services for this project consisted of the following:

- We reviewed readily available background data, including the original geotechnical report from 2012 and data, geotechnical literature, geologic maps, topographic maps, stereo aerial photographs, seismic hazard maps and literature, and flood hazard maps relevant to the subject site.

- We performed geologic mapping of the project site and field observations of bedrock outcrops in the vicinity. A geologic map and geologic cross-section were produced presenting the field data and mapping.

- As part of the update, we performed a geotechnical and geological site reconnaissance to observe the general surficial conditions and selected two boring locations closer to the abutment location on the east side of the creek. After boring locations were delineated, Underground Service Alert was notified of the planned locations a minimum of 72 hours prior to excavation.

- We performed a seismic refraction survey in order to determine the depth to bedrock within the area for the proposed east abutment. This study was performed in 2011 during the original study.

- We performed a subsurface evaluation, including the excavation, logging, and sampling of three 8-inch-diameter exploratory borings during the original study and two borings as part of this update report. The borings were advanced to depths ranging between approximately 5 and 45 feet below the existing grade. We obtained samples of earth materials from the borings and transported them to our in-house laboratory for observation and testing.

- We performed laboratory testing on selected samples of earth materials in order to evaluate the geotechnical engineering properties of the on-site soils. Laboratory tests included in-situ moisture content and dry density, Atterberg limits, sieve, direct shear, consolidation, maximum dry density-optimum moisture content, expansion index, and potential for on-site soils to corrode construction materials.

- We compiled and analyzed the data collected from our site reconnaissance, subsurface evaluation, and laboratory testing. Specifically, our analyses included the following:

    - Evaluation of general subsurface conditions and description of types, distribution, and engineering characteristics of subsurface materials;

    - Evaluation of geologic hazards and engineering seismology, including evaluation of fault rupture hazard, seismic shaking hazard, liquefaction and seismic settlement potential;

    - Evaluation of current and historical groundwater conditions at the site and potential impact on design and construction;

    - Evaluation of seismic design parameters in accordance with the 2016 California Building Code;

    - Preparation of recommendations for site grading and subgrade preparation;

    - Evaluation of slope stability for the existing slopes at the abutment areas;

    - Evaluation of foundation design parameters including allowable bearing capacity for shallow foundations, estimated settlement, lateral earth pressures, and lateral resistance;

    - Evaluation of deep foundation design parameters including general construction guidelines;

    - Evaluation of lateral earth pressures for retaining walls and retaining wall backfill;

    - Evaluation of expansive soils; and

    - Evaluation of the potential for the on-site materials to corrode buried concrete and steel objects.

- We prepared this report that presents the work performed and data acquired, and summarizes our conclusions and geotechnical recommendations for the design and construction of the proposed project.

4. FIELD EXPLORATIONS AND LABORATORY TESTING

4.1. Field Exploration

The subsurface conditions were evaluated by advancing three 8-inch-diameter hollow-stem auger borings using a Mobile B-80 truck-mounted drill rig during the 2011 report and two 6-inch-diameter hollow-stem auger borings using a CME 75 truck-mounted drill rig as part of the update report. The approximate locations of the exploratory borings are shown on Figure 2, Boring Location Map. The Logs of Borings are presented in Appendix A.

The borings were advanced to depths between approximately 5 and 45-feet below the existing grades. Driven samples of the soil were obtained using a standard penetration test (SPT) sampler and a modified California split-spoon sampler. The samplers were driven using a 140-pound, cat-head hammer falling approximately 30 inches. The blow counts were recorded, and the materials encountered in the borings were logged by our field personnel. Upon completion of drilling, the borings were backfilled by the drilling subcontractor using soil derived from the cuttings.

A seismic refraction survey was conducted by Southwest Geophysics, Inc. in addition to the soil borings. The survey was performed as an additional method to evaluate the depth to bedrock and to develop subsurface velocity profiles. This method was utilized due to the access limitations of the site. Locations and results of the seismic refractions are presented in Appendix C.

4.2. Laboratory Testing

Laboratory tests were performed on selected samples obtained from the borings in order to aid in the soil classification and to evaluate the engineering properties of the foundation soils. The following tests were performed:

- In-situ moisture and density;
- Atterberg limits;
- Sieve;
- Maximum dry density-optimum moisture content;
- Direct shear;
- Consolidation;
- Expansion index; and
- Corrosivity.

The moisture content and density data are presented on the boring logs in Appendix A. The remaining laboratory test results are presented in Appendix B. Details of the laboratory testing program are also included in Appendix B.

5. REGIONAL GEOLOGIC SETTING AND SUBSURFACE CONDITIONS

The project site is situated in Arroyo Conejo canyon at the base of unnamed hills which are part of the Transverse Ranges geomorphic province. The Transverse Ranges are characterized by east-west trending mountain ranges formed as the result of uplift along east-west striking faults.

Geologic mapping performed by Dibblee and Ehrenspeck (1993), depict the project site as underlain by Quaternary alluvium overlying basaltic rocks of the Conejo Volcanics. A portion of the Dibblee and Ehrenspeck's geologic mapping is reproduced as Figure 4, Regional Geologic Map.

5.1. Aerial Photograph and Field Mapping

Mapping of the geomorphology of the site utilizing single-image and stereo aerial photographs dated 1938, 1945, 1965,1970, and 1980 was performed as a preliminary task for field mapping. Aerial photograph mapping of the project site identifies that the creek channels of the north and south forks of Arroyo Conejo migrate laterally over time. During the period of 1938 to 1965, the confluence of the north and south forks was located northwest of the proposed bridge, whereas presently the confluence is located southeast of the bridge location.

Field mapping of the project site and vicinity was performed on January 18, 2019, to map the surface geologic units, confirm aerial photograph mapping of the site, acquire bedding data of the Conejo Volcanics bedrock in the vicinity. Mapping of the geology of the project site utilized the site plan topographic map provided by Stantec and the geologic map is presented in Plate 1, Geologic Map. The geologic mapping and locations of subsurface exploration borings and seismic surveys were used to construct a geologic cross-section presented in Plate 2, Section A.

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5.2 Earth Material

Earth materials mapped at the project site and encountered during the subsurface exploration consist of artificial fill and alluvium deposits overlying basaltic rocks of the Conejo Volcanics (bedrock). Generalized descriptions of these units are provided below and supplemented with field observations and properties where acquired. Detailed descriptions of the earth materials encountered in the exploratory borings are presented in Appendix A, Field Exploration. The approximate locations of the exploratory borings are shown in Figure 2, Boring Location and Geologic Map.

5.2.1 Fill

Fill associated with previous grading of the site was ecnountered in Boring B-1. As encountered in our boring, the depth of fill extends to approximately 6 feet below the existing grade. The fill generally consists of dark brown, medium dense, clayey sand with gravel.

5.2.2 Alluvium

Alluvium of Holocene age (less than 11,700 years) was mapped in the Arroyo Conejo valley and is surrounded by hills underlain by Miocene-age basaltic rocks of the Conejo Volcanics. The alluvium consists of channelized, channel, fill, and stream terrace deposits. Former abandoned channels located northwest of the proposed bridge are preserved along the banks of Arroyo Conejo. The banks of the Arroyo Conejo are densly to moderately vegetated obscurring exposures of the alluvium

Alluvium was encountered in each of the exploratory borings and generally varied in thickness from five to eight feet near the proposed southwest bridge abutment, whereas the thickness of alluvium ranged from approximately 5 feet to over 40 feet below the ground surface based on the borings drilled on-site. The alluvium is underalin by Conejo Volcanics bedrock. Based on the aerial photograph, field mapping, and subsurface data, former channels of the north and south forks were located in the area of borings B-1, B-4, and B-5. Regional aggradation (filling in) of Holocene creek channels occurred due to rising Holocene sea levels resulting in the sequence of alluvium encountered in these borings. The north fork of Arroyo Conejo may have migrated southward to its current position on the south side of the vally in the last few hundred years as indicated by shallowing bedrock to the south of the valley.

The alluvium materials generally consists of yellow-brown to dark yellow-brown, moist, silty sand and brown, medium stiff to very stiff, sandy lean clay to sandy fat clay. Portions of the alluvial strata encountered were saturated due to perched groundwater condions and is described in the following section.

Refusal was encountered in each of the exploratory borings at the bedrock contact. Based on exposures observed in the field and published geologic maps, the bedrock consists of basaltic rocks of the Conejo Volcanics. Bedrock is approximately within five to eight feet below existing ground surface (B-2, and B-3) of the ground surface in the proposed area of the west abutment and approximately 38 to 43 feet below existing ground surface (B-1 and B-4) in the proposed area of the east abutment.

5.2.3 Conejo Volcanics

The rocks mapped and observed in the project site vicinity are basaltic rocks composed of flow breccias, and minor dacitic flow breccias. The rocks consist of gray, pale red, and olive fine to coarse-grained basalts to locally, andesites. The degree of weathering of the surficial rocks are faintly to slightly weathered with local areas exhibiting slightly-moderately weathered. Bedding generally ranges from massive to crudely bedded to unstratified.

Qualitative field strength estimates range from approximately very strong to strong with minor moderately strong rock strength where slightly-moderately weathered and fractured (Johnson and DeGraff, 1988). An outcrop located north of the northeastern bridge abutment exhibits crude bedding which strikes approximately N88E and is inclined 22 degrees to the northwest. The measured bedding attitude is consistent with mapped attitudes in the project site vicinity by Dibblee (1993).

5.3 Groundwater

Perched groundwater was encountered in exploratory borings B-1, B-4, and B-5 at equilibrated levels of approximately 32 feet, 18 feet, and 20 feet, respectively, below the existing ground surface. The California Department of Conservation, Division of Mines and Geology (2002a) has mapped the historical high groundwater conditions for the area as approximately 10 feet below the existing grades. 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 and activities by humans at this and nearby sites.

5.4 Geologic Hazards

5.4.1 Seismic Hazard Zones

As part of our study, we performed a limited evaluation of possible geologic hazards at the site. Based on our review of the State of California Official Map of Seismic Hazard Zones for the Nebury Park Quadrangle (CGS, 2002b), the site is located within a Zone for Required Investigation for Liquefaction.

Our opinion regarding the potential for liquefaction at the project site is discussed in Section 6.4 below.

The site is not located within an area designated by the State of California as a Zone of Required Investigation for Earthquake-Induced Landslides (California Department of Conservation, Division of Mines and Geology, 2002b). Based on our review of the site conditions and our slope stability analysis, it is our opinion that the potential for earthquake-induced landslides to occur at the site is low.

5.4.2 Flooding

The Federal Emergency Management Agency has developed flood maps as part of the National Flood Insurance Program. Based on our review of these maps, the project site is partially located in a special flood hazard area subject to inundation by the 1% annual chance flood. The 100-year flood level was reported to us as at elevation 267.37 feet. No other base flood elevations have been determined for the area. It is our opinion that there is a potential flood hazard at the site.

6. ENGINEERING SEISMOLOGY AND DESIGN

The southern California region is known to be seismically active. Earthquakes occurring within approximately 60 miles of the site are generally capable of generating ground shaking of engineering significance to the proposed construction. The project area is located in the general proximity of several active and potentially active faults. Active faults are defined as those that have experienced surface displacement within Holocene time (approximately the last 11,700 years).

6.2 Active Faulting

Maps of Earthquake Fault Zones published by the California Geological Survey were reviewed to evaluate the location of the project site relative to known active fault zones. Alquist-Priolo Earthquake

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Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act of 1972, as amended. The act directs the State Geologist to delineate the regulatory zones that encompass the surface traces of active faults that exhibit a potential for future surface fault rupture. The purpose of the act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

The project site is located on the Newbury Park Quadrangle. The Newbury Quadrangle does contain delineated Earthquake Fault Zones. The closest mapped Earthquake Fault Zone is located approximately 1.6 miles north of the project site. A portion of the map prepared by the California Department of Conservation, Division of Mines and Geology (1999) is reproduced as Figure 8, Earthquake Fault Zones Map.

Neither our aerial photograph or field observations nor our review of published geologic literature indicate that the surface traces of any active faults are mapped underlying or near the project site. Therefore, the likelihood of fault rupture occurring at the site during the design life of the proposed improvements is considered to be low.

6.3 Historical Seismicity

In the absence of fault rupture, the greatest seismic hazard likely to affect the site is seismic shaking due to one or more earthquakes generated on nearby or distant active faults. The approximate locations of major faults in the region and their geographic relationship to the site are shown on Figure 9, Fault Location Map. The epicentral locations of selected historic earthquakes in southern California have been plotted by the California Division of Mines and Geology (Toppozada et al., 2000). A reproduction of this map is presented as Figure 10, Historical Seismicity, 1800-1999.

6.4 Code-Based Geotechnical Parameters for Earthquake Design

The earthquake design of the project should be performed using criteria presented in the 2010 California Building Code (California Building Standards Commission, 2010), Volume 2 of 2, Chapter 16, Section 1613. The earthquake design parameters are listed in Table 1. The graphs and seismic design parameters are also presented in Appendix F.

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Table 1
2010 California Building Code Seismic Design Parameters

2016 CBC Seismic Design Factor	Value
Occupancy Category	II
0.2-Second Mapped Spectral Acceleration Parameter, S_s	1.819
1-Second Mapped Spectral Acceleration Parameter, S_1	0.668
Site Class	B
Short Period Site Coefficient, F_a	1.0
1-Second Period Site Coefficient, F_v	1.0
Short Period Adjusted MCE[1] Spectral Response Acceleration Parameter, S_{MS}	1.819
1-Second Period Adjusted MCE[1] Spectral Response Acceleration Parameter, S_{M1}	0.668
Short Period Design Spectral Response Acceleration Parameter, S_{DS}	2/3 S_{MS} = 1.213
1-Second Period Design Spectral Response Acceleration Parameter, S_{D1}	2/3 S_{M1} = 0.445
Seismic Design Category	D
[1]Maximum considered earthquake	

6.5 Liquefaction and Seismic Settlement Potential

Liquefaction occurs when the pore pressures generated within a soil mass approach the effective overburden pressure. This results in a loss of strength, and the soil then possesses a certain degree of mobility sufficient to permit both horizontal and vertical movements. Liquefaction of soils may be caused by ground shaking during earthquakes. Liquefaction is generally known to occur in loose, saturated, relatively clean, fine-grained 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.

The site is located in an area mapped as a Zone for Required Investigation for Liquefaction by the State of California (CGS, 2002). Earthquake moment magnitudes for the project site were evaluated based on fault parameter values published by CGS (Cao et al., 2003). The peak ground acceleration (PGA) at the project site is 0.694 g.

The average shear wave velocity estimated from the seismic refraction data was used for the liquefaction analysis. Historical high groundwater level was assumed to be at the ground surface of elevation 268 feet. Since the east abutment will be directly underlain by alluvium and the west abutment will be underlain by bedrock, the liquefaction analysis focused on the east abutment area. The assumed alluvium soil layers consist of silty sand underlain by a layer of fat clay. The silty sand layer is not susceptible to liquefaction due to its shear wave velocity greater than 215 meters/second. The fat clay is not susceptible to liquefaction based on the Chinese Criteria. The alluvium is underlain by bedrock and as such is not subject to liquefaction. Our liquefaction evaluation was performed in accordance with Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California by SCEC, dated March 1999, and also in accordance with Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils, by Youd et al., 2001.

Seismic settlement can occur when loose to medium dense granular materials densify during seismic shaking. Seismically-induced settlement may occur in dry, unsaturated, as well as saturated soils. Based on the results of our subsurface investigation, seismic settlement should be negligible.

7. SLOPE STABILITY

Static and pseudostatic slope stability analyses were performed to evaluate the gross stability of the slopes in the areas of the proposed abutments. Our results indicate minimum factors of safety greater than 1.5 for static and pseudostatic conditions, which is greater than the minimum factors of safety for slopes considered to be grossly stable in engineering practice in California. A uniform surcharge of 1,000 pounds per square foot was applied in our model. A value of 0.15 for the coefficient of horizontal acceleration was used in our pseudostatic analysis. The results of our analyses are presented in Appendix D, Slope Stability.

We used the computer program GSTABL7 developed by Gregory Geotechnical Software (2003) to employ Modified Bishop's Method and Janbu's Simplified Method of slope stability evaluation to evaluate the slopes. The computer program implements an automatic search routine to identify the lowest calculated factor of safety based upon user-defined limits.

Shear strength parameters were selected from direct shear test results from soil samples collected from Boring B-1. The direct shear tests consist of initial shear and residual shear data. The most conservative residual shear strength parameters, which are based on stresses at approximately ¼-inch displacement obtained during testing, were used. Shear strength parameters for the basaltic bedrock were obtained from the Seismic Hazard Zone Report for the Newbury Park Quadrangle, California Department of Conservation, Division of Mines and Geology.

8. DESIGN RECOMMENDATIONS

8.1 General

Based on the results of the 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. It is our opinion that the proposed bridge abutment walls should be supported on competent bedrock. The abutment walls may be supported by shallow foundations or deep foundations consisting of spread footings or cast-in-drilled-hole (CIDH) piles, respectively. For preliminary design, we have assumed 24-inch and 30-inch diameter CIDH piers in our analyses. Ancillary structures that are lightly loaded may be supported by shallow foundations bearing on bedrock or engineered fill.

Our geotechnical engineering analyses performed for this report were based on the soil encountered during the subsurface exploration. If the design substantially changes, our geotechnical engineering recommendations would be subject to revision based on the additional evaluation of the changes.

8.2 Site Preparation

All deleterious, organic, and oversized materials (greater than 6 inches in maximum dimension) should be removed from any existing areas that will receive fill and disposed outside of the construction limits. Prior to placement of fill at the site, the upper 3 feet of the existing soil should be overexcavated and replaced as engineered fill. The exposed bottoms of overexcavations should be observed by the geotechnical engineer and/or his representative prior to processing. The bottoms of overexcavations should be processed by scarifying to a depth of approximately 8 inches, moisture-conditioned to about 2 percent above the optimum moisture content of the soil and compacted to at least 90 percent of the maximum dry density based on the latest version of ASTM D1557. This Moisture conditioning may consist of drying back of the soils if they are excessively wet.

Footings for lightly-loaded ancillary structures bearing on soil should be overexcavated a minimum of 3 feet below the proposed footing bottom. Overexcavation should extend laterally a minimum distance of 5 feet. Overexcavation is not be required if the footings are founded on competent, intact bedrock.

The sandy soils on site should be considered suitable for use as engineered fill provided that all deleterious, organic and oversized materials (greater than 6 inches in maximum dimension) are removed prior to placement. Engineered fill should be placed in lifts of loose thickness not exceeding 8 inches, moisture-conditioned to approximately 2 percent of the optimum moisture content and compacted to at least 95 percent of the maximum dry density based on the latest version of ASTM D1557.

Pumping soils or unstable soils may be encountered at overexcavation bottoms based on the soil moisture contents during our subsurface exploration. Provisions in the project specifications should be made to address the potential for encountering unstable conditions. Excavation bottoms may be stabilized by drying back of the soils, working thin lifts of 1-1/2-inch (minimum size) float rock into the excavation bottoms until stabilization is achieved, or cement treatment of the soils. Use of filter fabric wrapped around the gravel section is recommended. Other methods of stabilization may be recommended depending on the conditions encountered in the field during construction.

8.3 Foundation Recommendations

The proposed abutment walls should be supported on shallow spread footings or CIDH piers founded on intact, competent bedrock consisting of basalt. Ancillary structures that are lightly loaded, such as site retaining walls, should be supported on shallow spread footings founded on engineered fill or intact, competent bedrock. Footing excavations and CIDH pier excavations should be observed by the geotechnical engineer prior to placement of reinforcing steel and concrete.

8.3.1 Footings for Ancillary Structures

Shallow spread or continuous footings for ancillary structures that are lightly loaded should be at least 12-inches wide and embedded a minimum of 18-inches below the lowest adjacent grade. The footings should be supported by at least 3 feet of engineered fill. The allowable bearing pressure should be a maximum of 2,500 pounds per square foot (psf) for the minimum dimensions stated above. The allowable bearing pressure may be increased by one-third for short-term wind or seismic loads. Estimated total and differential footing settlement should be less than approximately 1 inch and ½ inch, respectively.

Lateral loads acting on ancillary structures may be resisted by friction between the bottom of foundations and the supporting soils. An ultimate friction coefficient of 0.50 is recommended. In addition, resistance to lateral loading may be derived from the soil with an equivalent fluid weight of 300 pounds per cubic foot (pcf), provided the foundations are poured tight against undisturbed or compacted soil. Use of an appropriate factor of safety is recommended for both parameters. The aforementioned parameters are unfactored loads and may be increased by one-third for short-term loads such as wind or seismic loading.

8.3.2 Footings for Abutment Walls

Shallow spread or continuous footings for abutment walls should be at least 12 inches wide and be founded at least 18 inches into intact, competent bedrock consisting of basalt. The allowable bearing pressure should be a maximum of 4,500 psf for the minimum dimensions. The allowable bearing pressure may be increased by one-third for short-term wind or seismic loads. Estimated total and differential footing settlement should be less than approximately ½ inch and ¼ inch, respectively.

Lateral loads acting on structures may be resisted by friction between the bottom of foundations and the supporting soils. An ultimate friction coefficient of 0.55 is recommended. In addition,

resistance to lateral loading may be derived from bedrock with an equivelnt fluid weight of 425 pounds per cubic foot (pcf) may be assumed to act against the footings, provided the foundations are poured tight against undisturbed bedrock. The aforementioned parameters may be increased by one-third for short-term loads such as wind or seismic loading.

8.3.3 CIDH Piles

Abutment walls at both sides of the bridge should be supported by CIDH pilres utilizing both end-bearing and skin friction resistances. The piles should be embedded a minimum of 3 feet into competent bedrock. Bedrock was encountered in Boring No. 4 at an approximate depth of 43 feet below existing grade but not encountered in Boring No. 5 drilled to a depth of about 45 feet below existing ground surfcae. The actual depth to the bedrock should be determined in the field during construction by the Geotechnical Engineer or his representitive. The actual depth and reinforcing of the caissons should be determined by the Project Structural Engineer. The pier excavation bottom should be cleaned. Any loose soil or earth-material debris that has fallen into the excavation should be removed prior to placement of reinforcing steel and concrete.

The maximum allowable bearing pressure at the tip of the CIDH piles should not exceed 5,000 psf. In addition an allowable skin friction of 300 psf/ft of depth may also be utlized for design. Lateral capacities of 24- and 30-inch-diameter caissons were analyzed using Allpile software. The results are presented in Appendix E. The effective diameter of a caisson can be assumed to be twice its actual diameter in determining lateral resistance. Pier spacing should be at least three pier diameters from center to center to avoid capacity reduction due to group effect.

Values provided assume piles or piers will be located at least 5 feet horizontally from any adjacent descending slopes.

Groundwater was encountered at approximate depth of about 22 feet below existing ground surface (bgs) during drilling and was measured at a depth of approximately 20 feet bgs at the completion of drilling. Casing or other means may be necessary to stabilize the upper part of the caisson excavations. Use of a tremie is recommended to place to place concrete under water or if the reinforcement in the caisson requires a tight pattern that will restrict the freefall of the concrete without segregation. Free water is expected to be encountered during construction. Difficulty in excavation into the bedrock can be encountered and the drilling contractor should be aware of that difficulty and the presence of water in the excavations. Use of a competent caisson drilling contractor is strongly recommended. Additional recommendations are provided below.

8.3.3.1 General Construction Guidelines for CIDH Piles

Excavation: The medium dense to very dense sands should be excavatable using conventional pier excavation equipment. Because the wet, sandy soil may run into the excavation, the use of a temporary casing may be required to stabilize the sides of the pier excavation. The disposal of excavated soils must be executed in accordance with local, state, and federal regulations. We recommend that final cleanout of the excavations for the drilled piers be performed using a purpose-built, bottom-cleanout bucket. The cleanout bucket should have full-radius, straight-edged soil cutting blades that will trim and collect disturbed soil when lowered to the excavation bottom and rotated. The cleanout bucket should have bottom closure flaps to assist in complete cleanout of cuttings and to prevent loss of cuttings during bucket withdrawal.

Concrete Placement: The concrete for the piers should be placed using a down-hole tremie, or similar provision such that the falling concrete does not strike the sides of the shaft. Concrete should be placed in newly excavated piers as soon as practical. We recommend the caissons to be filled on the same day of drilling to reduce chance of caving. The concrete must be capable of propagating between the reinforcing bars to come in contact with the soil and to avoid arching during extraction of the casing. A 7 to 9 inch of concrete slump below water is

recommended. The reinforcing cage should be placed carefully in the hole in a manner such that the soil is not disturbed.

Tolerances: Quality of construction is of primary importance in the construction of CIDH piles. The piles should not deviate from a plumb line at the centerline by more than 2 percent of the caisson's length.

Observation: Full-time observation by the geotechnical engineer or his representative is highly recommended. The observation work should provide full documentation of the pier construction. Before construction, the status and performance of nearby existing structures should be documented. In addition, instrumentation of certain structures may be desirable during and after the construction operations to monitor movement.

Nondestructive Testing: On-site, continuous observations of drilling, placement of reinforcing steel and placement of concrete is recommended. We recommend that gamma-gamma testing tubes be placed in all caissons. It is our opinion that the placement of these tubes is a prident practice in case any anomolies occur during drilling. Gamma-gamma testing would be recommended only if observations during drilling warrant testing. Examples of such anomalies would be inconsistency in the theoretical versus actual volumes of concrete placement and observed caving during drilling operations. We note that the structural engineer should be involved in discussions where such anomalies occur and the decision to perform gamma-gamma testing will be based on input from both the geotechnical and structural engineers.

8.4 Retaining Walls

8.4.1 Lateral Earth Pressure

Conventional cantilever retaining walls backfilled with compacted on-site soils may be designed for active pressures developed from 42 pcf of equivalent fluid weight for well-drained, level backfill conditions and 52 pcf for a 2:1 sloping backfill. For a restrained retaining wall, an at-rest pressure of 55 pcf of equivalent fluid weight may be used. If a well-drained material such a sand is used as back fill, an equivalent fluid weight of 35 pcf may be used in design. The recommended design lateral earth pressure is calculated assuming that a drainage system will be installed behind the walls and that external hydrostatic pressure will not develop behind the wall.

Vertical surcharge loads within a 1:1 projection from the bottom of the wall distributed over retained soils should be considered as additional uniform horizontal pressure acting on the wall. The additional horizontal pressure acting on the wall can be estimated as approximately 40 percent and of the magnitude of the vertical surcharge pressure for the “active” conditions. Permanent surcharge loading conditions should be evaluated on a case-by-case basis by the geotechnical engineer.

8.4.2 Seismic Lateral Earth Pressure

Walls that retain less than 6 feet of soil need not be designed for seismic lateral earth pressures. Should the project require retaining structures taller than 6 feet, we recommend a seismic increment of 22H, where H is the height of the wall. This seismic increment is a triangular distribution along the height of the wall and increases with depth. The seismic increment should be added to the static active component of the lateral loading for both cantilevered and restrained walls.

8.4.3 Backfill and Drainage of Walls

Backfill material should extend a distance of at least H/2 behind the wall, where H is the height of the wall. Retaining walls should be adequately drained. Adequate backfill drainage is essential in order to provide a free-drained backfill condition and to limit hydrostatic buildup behind walls. The

wall should be appropriately waterproofed. Drainage behind the walls may be provided by a geosynthetic drainage composite such as TerraDrain, MiraDrain, or equivalent, attached to the outside perimeter of the wall. The drain should be placed continuously along the back of the wall and connected to a 4-inch-diameter perforated pipe. The pipe should be sloped at least 1 percent and should be surrounded by 1 cubic foot per foot of ¾-inch crushed rock wrapped in suitable non-woven filter fabric (Mirafi 140NL or equivalent). The crushed rock should meet the requirements defined in Section 200-1.2 of the latest edition of The "Greenbook" Standard Specifications for Public Works Construction (Public Works Standards, 2018). The drain should discharge through a solid pipe to an appropriate outlet.

8.5 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 structure, even during periods of heavy rainfall.

8.6 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors, and may cause unacceptable settlement or heave of structures, concrete slabs supported on-grade, or pavements supported over these materials. Depending on the extent and location below finished subgrade, these soils could have a detrimental effect on the proposed construction.

Based on our laboratory test and classification of the near-surface soils, it is our opinion that these exposed soils will have a medium expansion potential. The recommendations provided in this report account for the presence of the on-site medium expansive soils. Every effort should be made to minimize large moisture content variations in the underlying soils. Testing of the final subgrade soils is imperative and should be conducted to evaluate their expansion potential and confirm or modify the recommendations presented herein.

8.7 Soil Corrosion

The potential for the on-site materials to corrode buried steel and concrete improvements was evaluated. Laboratory testing was performed on representative soil samples to evaluate pH, minimum resistivity, and chloride and soluble sulfate content. Table B-5 in Appendix B presents the results of our corrosivity testing. General recommendations to address the corrosion potential of the on-site soils are presented below. Imported fill materials, if used, should be tested to evaluate whether their corrosion potential is more severe than those assumed.

8.7.1 Reinforced Concrete

Laboratory tests indicate that the potential of sulfate attack on concrete in contact with the on-site soils is negligible based on ACI 318, Table 4.3.1.

Test results also indicate the potential for chloride attack of reinforcing steel in concrete structures and pipes in contact with soil is negligible.

8.7.2 Metallic

Laboratory resistivity testing indicates that the on-site soils are severely corrosive to buried ferrous metals. As a consequence of these conditions, we recommend that consideration be given to using plastic piping instead of metal, where possible. Alternatively, a corrosion specialist should be consulted regarding suitable types of piping and appropriate protection for underground metal conduits.

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9. PAVEMENT DESIGN

The R-Value measured on a sample of near surface soils was 14. We understand that a Traffic Index (TI) of 6 is required for the project. Assuming a TI of 6 and using the measured R-Value of 14, asphalt pavement sections should have a minimum gravel equivalent of 1.65 feet. This can be achieved by using 4 inches of asphalt concrete over 10 inches of aggregate base.

Subgrade for pavement should be overexcavated to a depth of 24 inches below the bottom of the new aggregate base layers. The exposed surface should be scarified and compacted to a minimum of 90 percent of maximum density in accordance with recommendations of the grading section. The subgrade should be firm and unyielding when proof rolled with a loaded water truck or similar heavy rubber-tired equipment. Aggregate base should be compacted to a minimum of 95% maximum density and should be firm and unyielding.

10. GENERAL GRADING RECOMMENDATIONS

The grading contractor is responsible to notify governmental agencies, as required, and a representative of Twining, Inc. at the start of site clearing and grubbing, at the initiation of grading, and any time that grading operations are resumed after an interruption. Each step of the grading should be evaluated in a specific area by a representative of Twining, Inc., and where required, should be approved by the applicable governmental agencies prior to proceeding with subsequent work.

The following site grading recommendations should be regarded as minimal. The site grading recommendations should be incorporated into the project plans and specifications.

1. Prior to grading, existing vegetation, trash, surface structures and debris should be removed and disposed off-site at a legal dumpsite. Any existing utility lines, or other subsurface structures, which are not to be utilized should be removed, destroyed, or abandoned in compliance with current governmental regulations and with concurrence from Twining, Inc.

2. Subsequent to clearing and grubbing operations, and prior to initial grading, a reasonable search should be made for subsurface obstructions and/or possible loose fill or detrimental soil types. This search should be conducted by the contractor, with advice from and under the observation of a representative of Twining, Inc.

3. Fill should be spread in 6- to 8-inch lifts and should be moisture conditioned and compacted in accordance with the recommendations presented in the "Site Preparation" subsection of this report. All undocumented fill or unsuitable soils within the building areas should be removed and compacted under observation and testing of a representative of Twining, Inc.

4. The exposed subgrade and/or excavation bottom should be observed and evaluated by a representative of Twining, Inc. for conformance with the intent of the recommendations presented in this report and prior to any further processing or fill placement. <u>It should be understood that the actual encountered conditions may warrant excavation and/or subgrade preparation beyond the extent recommended and/or anticipated in this report.</u>

5. On-site inorganic granular soils that are free of debris or contamination and are not greater than 6 inches in largest dimension are considered suitable for placement as compacted fill. A representative of Twining, Inc. should provide guidance for suitability and placement of on-site clay fill materials.

6. Observation and field tests shall be performed during grading by a representative of Twining, Inc. in order to assist the contractor in obtaining the proper moisture content and required degree of compaction. Where less than the required degree of compaction is indicated, additional

compactive effort and any necessary adjustments in the moisture content of the soil should be made to obtain the required compaction.

7. To evaluate the presence of satisfactory materials at design elevations, footing excavations should be observed to be clean of loosened soil and debris before placing steel or concrete and probed for soft areas. If soft or loose soils or unsatisfactory materials are encountered, these materials should be removed and replaced with compacted fill.

8. In the event that underground facilities such as pipes or underground storage tanks are encountered during grading, the appropriate authorities, property owners, and regulatory authorities should be notified. Removal of underground storage tanks is regulated by city or county health departments and/or by the fire department. In the event that tanks containing unknown substances are encountered, no attempts should be made to remove such objects until their contents have been ascertained and directions issued by competent professionals or regulators. Septic tanks should be removed entirely. Cesspools or seepage pits should be pumped of their contents and removed in their entirety. Water wells should be capped in accordance with the requirements of the appropriate regulatory agencies.

9. Wherever, in the opinion of a representative of Twining, Inc., an unsatisfactory condition is being created in any area, whether by cutting or filling, then the work should not proceed in that area until the condition has been corrected.

11. DESIGN REVIEW AND CONSTRUCTION MONITORING

Geotechnical review of plans and specifications is of paramount importance in engineering practice. The poor performance of many structures 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.

11.1.1 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 loads. 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, this office is best qualified to provide such review.

11.1.2 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.

12. LIMITATIONS

The recommendations and opinions expressed in this report are based on Twining, Inc.'s review of readily 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.

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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, Inc.'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, Inc. to observe grading operations and foundation excavations for the proposed construction. If parties other than Twining, Inc. 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, Inc. 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 City of Thousand Oaks 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, Inc. 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, Inc. from any liability resulting from the use of this report by any unauthorized party.

Twining, Inc. has endeavored to perform 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.

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13. SELECTED REFERENCES

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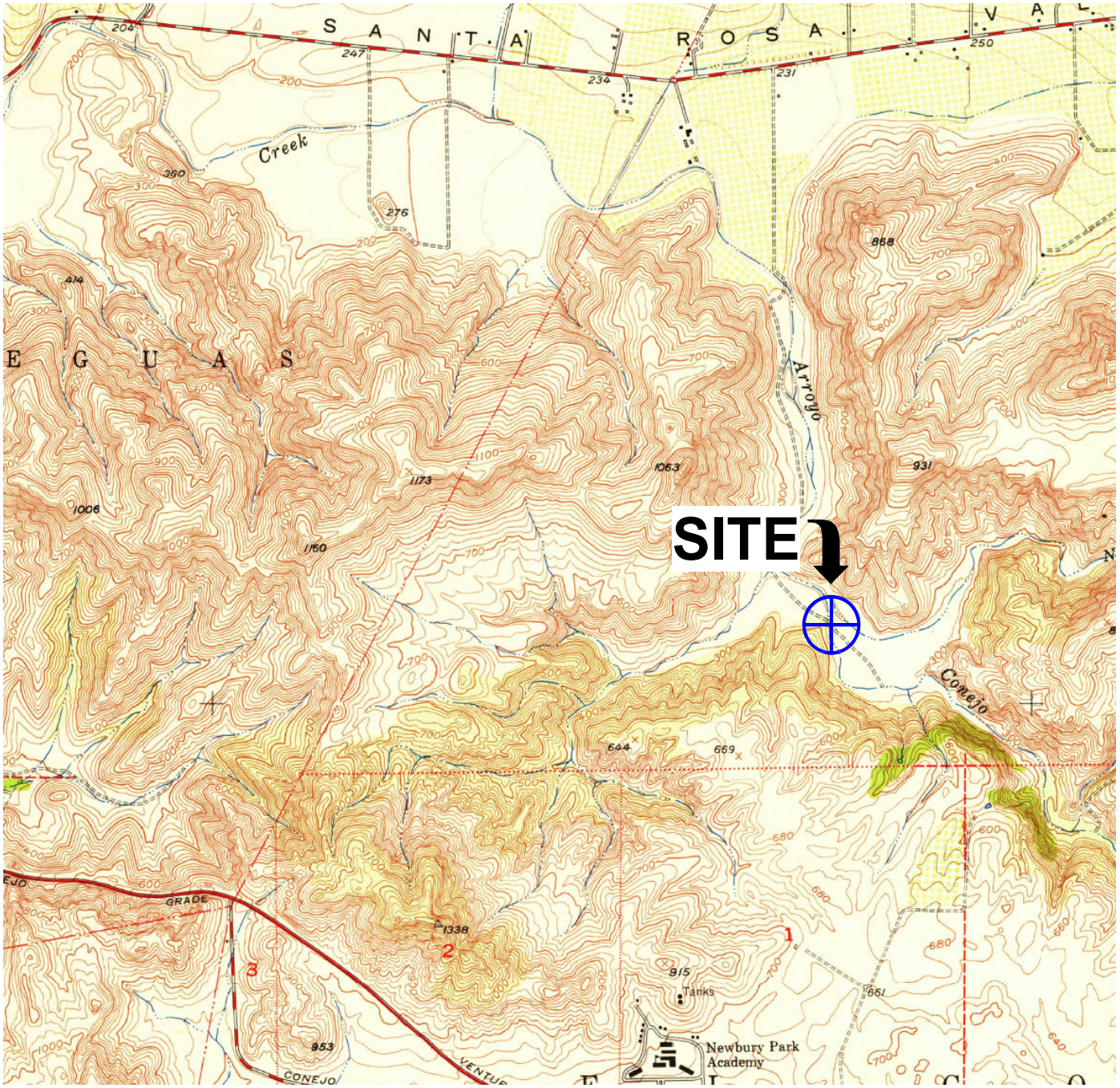
FIGURES



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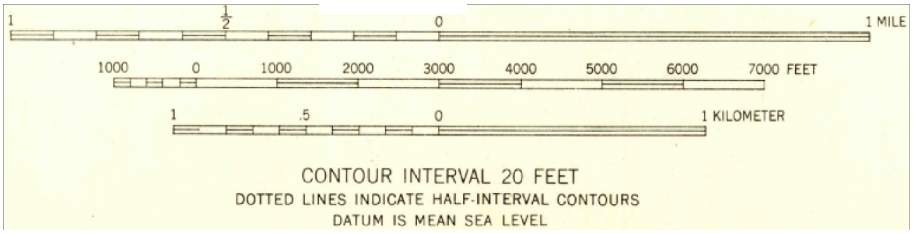

Site Coordinates
Latitude: 34.21164°N
Longitude: 118.92776°W

N

Reference: USGS 1951, Newbury Park Quadrangle, California - Ventura Co., 7.5 Minute Series (Topographic)

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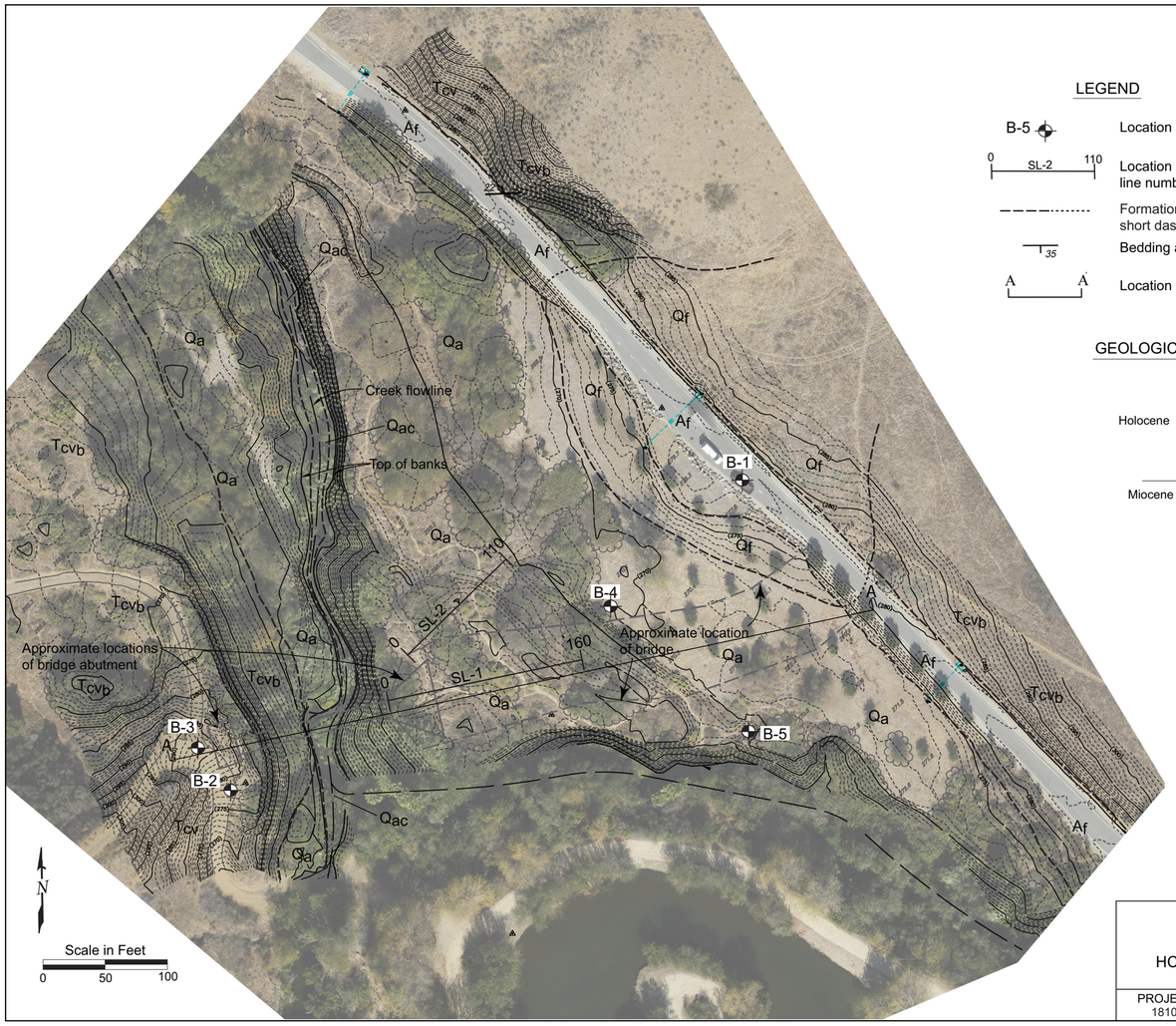
SITE LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 1



LEGEND

- B-5 — Location of geotechnical boring number 5
- 0 SL-2 110 — Location of Southwest Geophysics, Inc. seismic line number 2, showing station locations
- Formation contact; long dashed where approximate; short dashed where concealed
- 35 — Bedding attitude
- A — A′ — Location of cross-section A

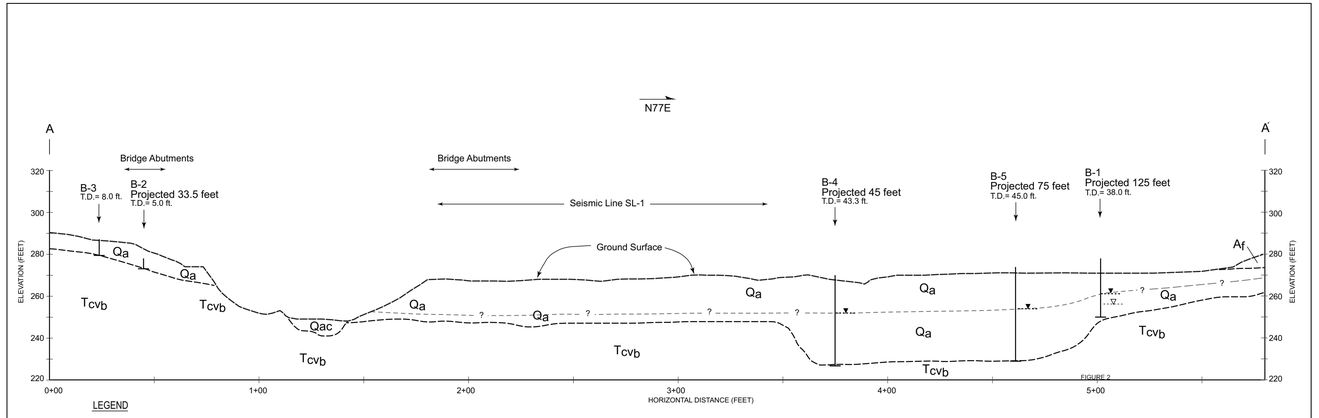
GEOLOGIC UNITS

Holocene	A_f	Artificial Fill
	Q_{ac}	Active Channel Alluvium
	Q_f	Alluvial Fan Deposits
	Q_a	Alluvium
Miocene	T_{cvb}	Conejo Volcanics

BORING LOCATION AND GEOLOGIC MAP

HCTP SECONDARY BRIDGE ACCESS

PROJECT NO.		
181010.4	JANUARY 2019	FIGURE 2



LEGEND

20 / 0 / 20 — Scale in feet
Horizontal = Vertical
1 Inch = 20 Feet

Geologic contact, long dashed where approximate; queried where uncertain

B-5
T.D. = 38.0 feet
Geotechnical boring number 5, total depth equals 38.0 feet

Equilibrated depth to perched water, measured after drilling
First encountered saturated materials

Groundwater, long dashed where approximate; short dashed and queried where uncertain

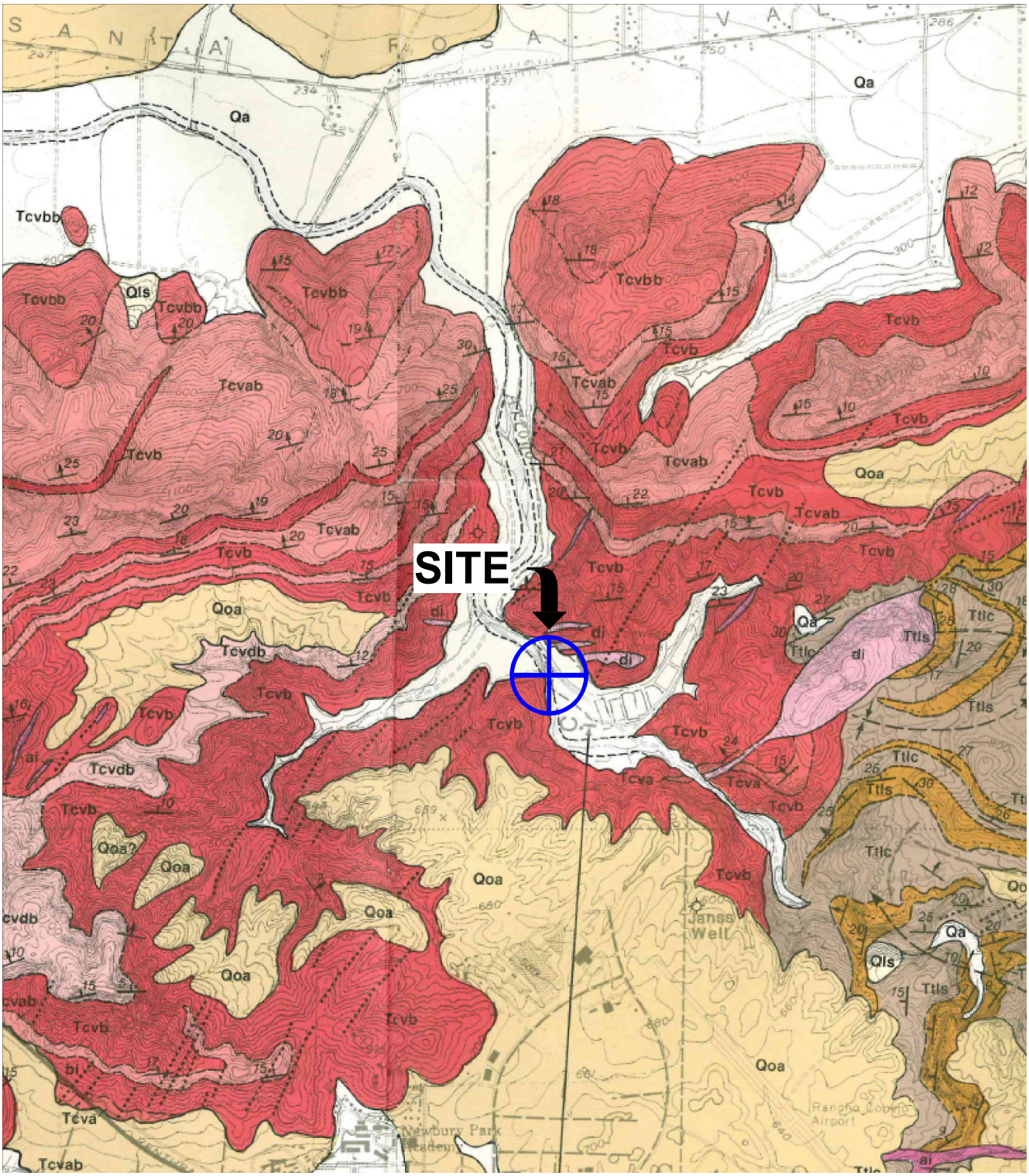
GEOLOGIC UNITS

	A_f	Artificial Fill
Holocene	Q_{ac}	Active Channel Alluvium
	Q_f	Alluvial Fan Deposits
	Q_a	Alluvium
Miocene	T_{cvb}	Conejo Volcanics

CROSS SECTION A-A'

HCTP SECONDARY BRIDGE ACCESS

PROJECT NO. 181010.4	JANUARY 2019	FIGURE 3



Reference: Dibblee, Jr. (1990)

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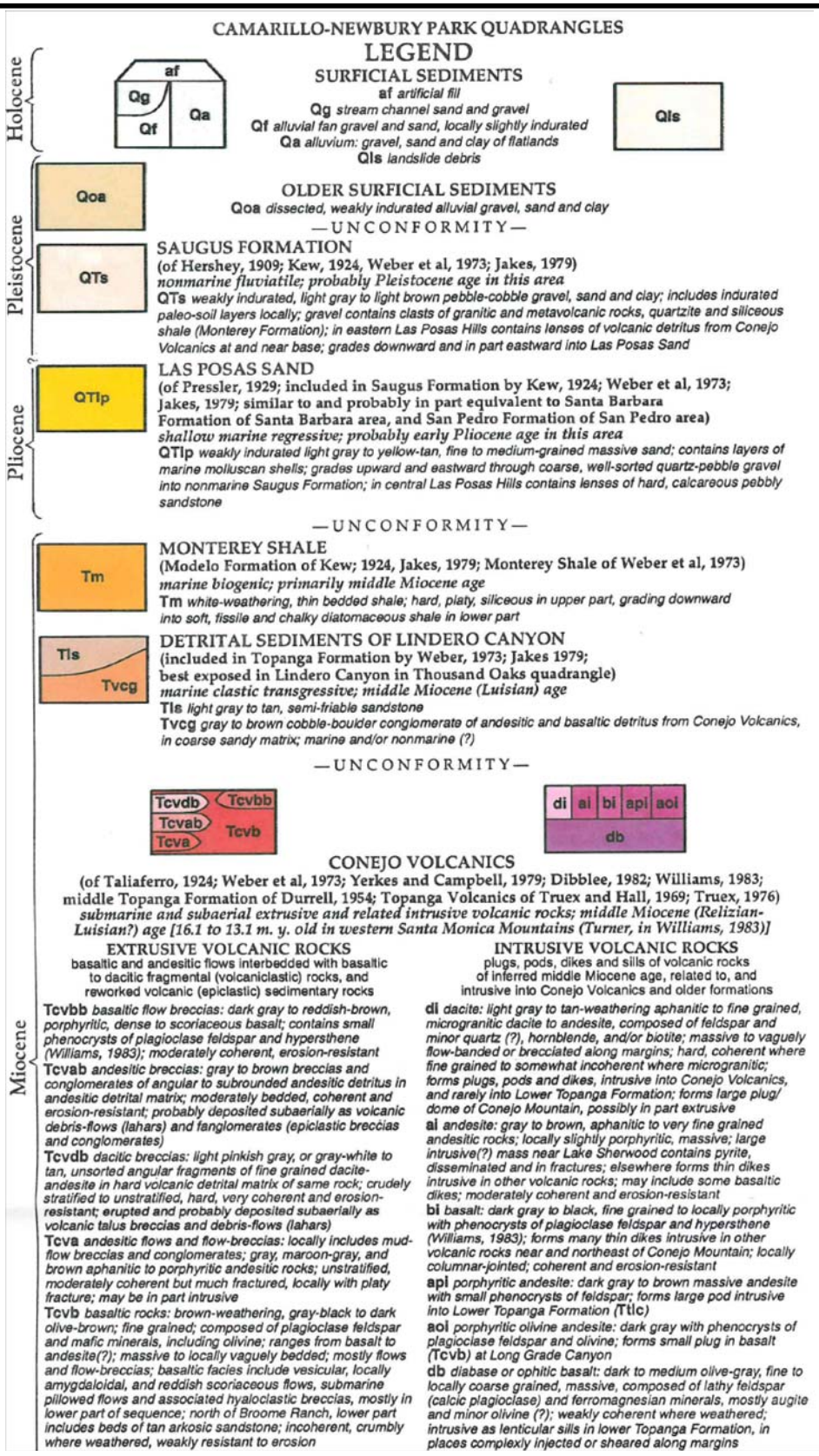
REGIONAL GEOLOGIC MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 4
181010.4	January 2019	Sheet 1 of 2



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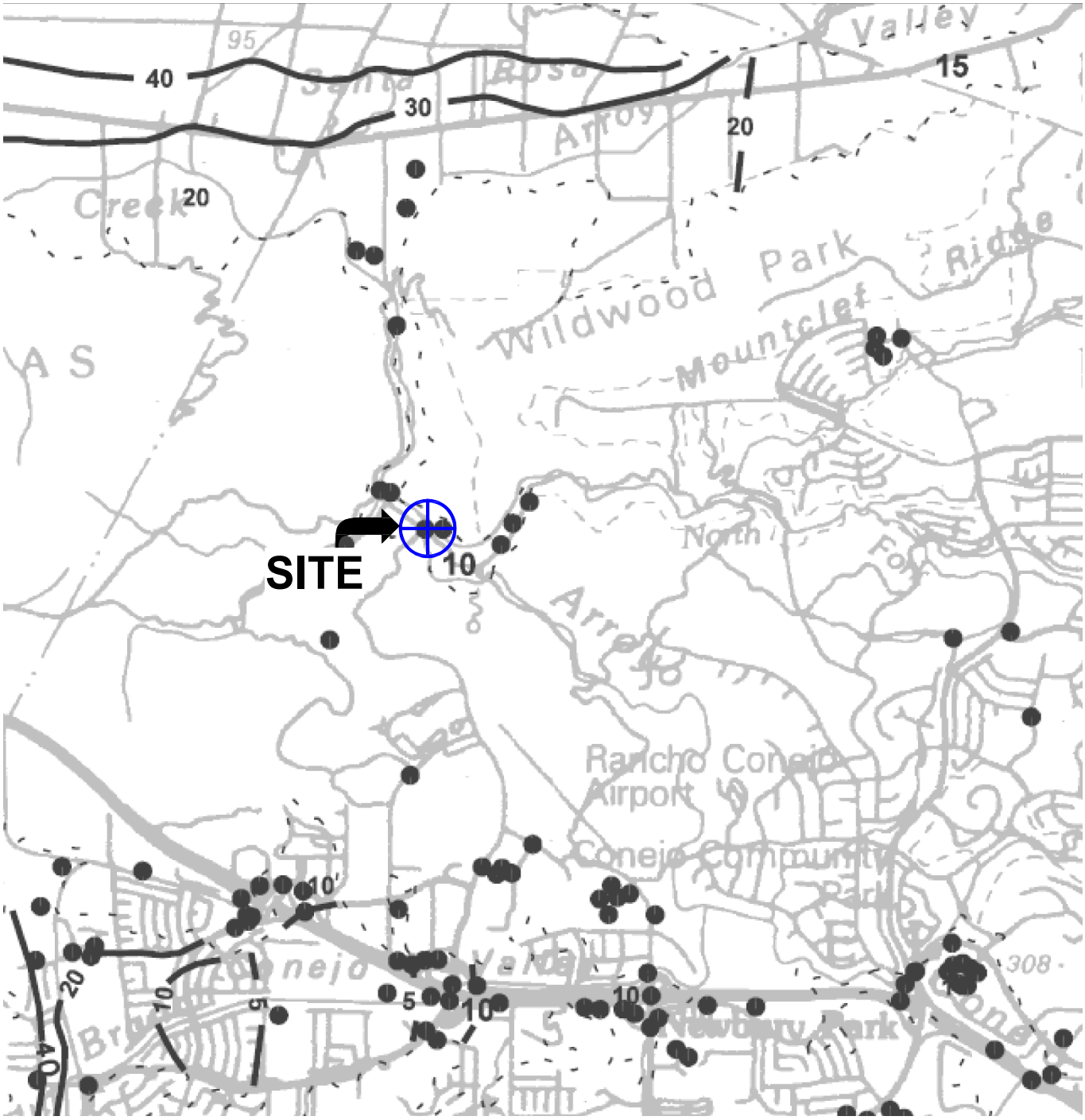
REGIONAL GEOLOGIC MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 4
181010.4	January 2019	Sheet 2 of 2



APPROXIMATE SCALE

.5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETER

N

LEGEND

Alluviated Valley

Borehole Site

20 Historically high ground–water depth contours (In feet)

15 Historically high ground–water depth where same value occurs over a broad area (In feet)

Reference: California Department of Conservation, Division of Mines and Geology (2002)

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HISTORICAL HIGH GROUNDWATER MAP

HCTP Secondary Access Bridge
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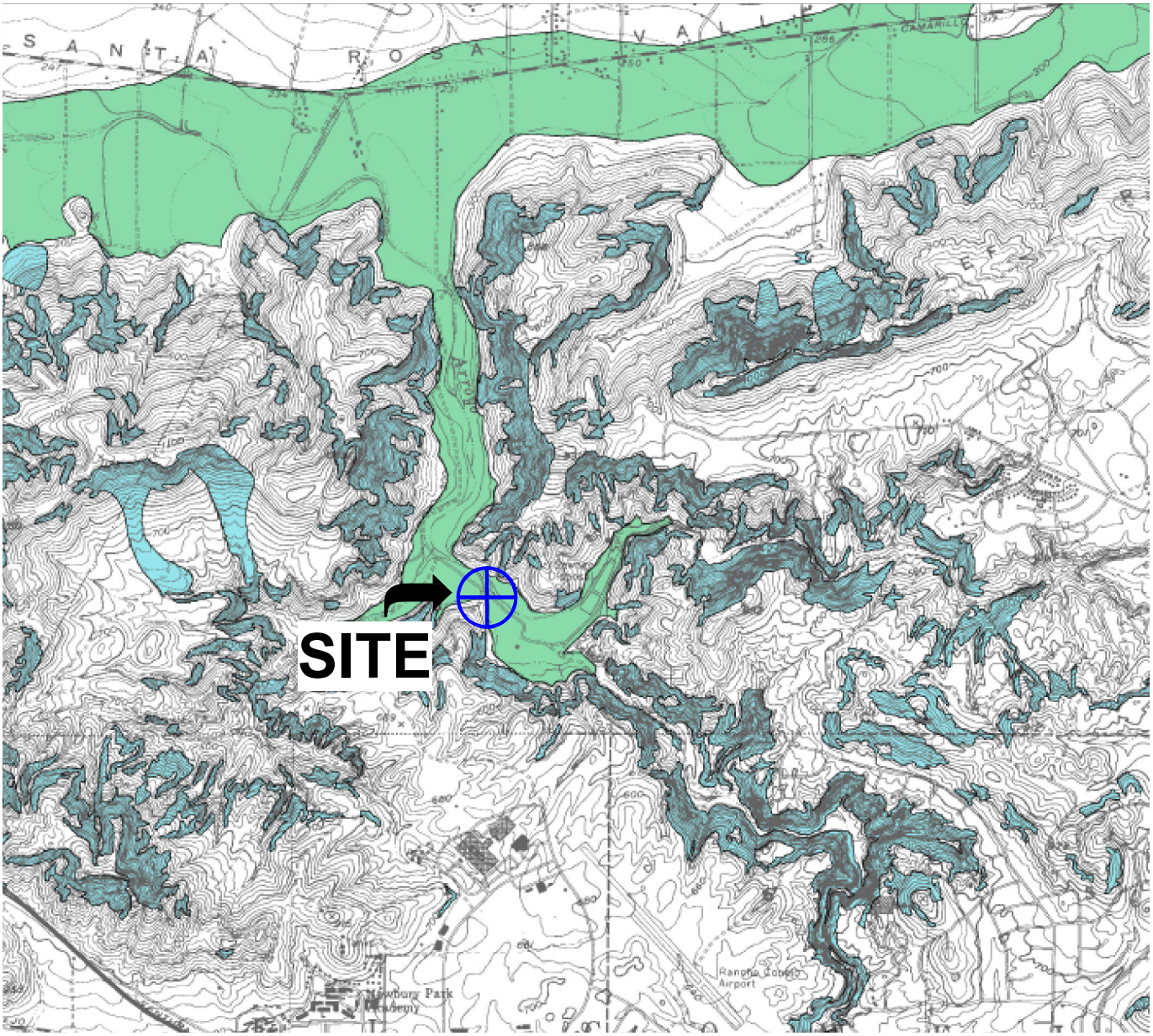
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 5
181010.4	January 2019	



APPROXIMATE SCALE

1 .5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

LEGEND

Liquefaction
Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslides
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Reference: California Department of Conservation, Division of Mines and Geoogy (2002b)

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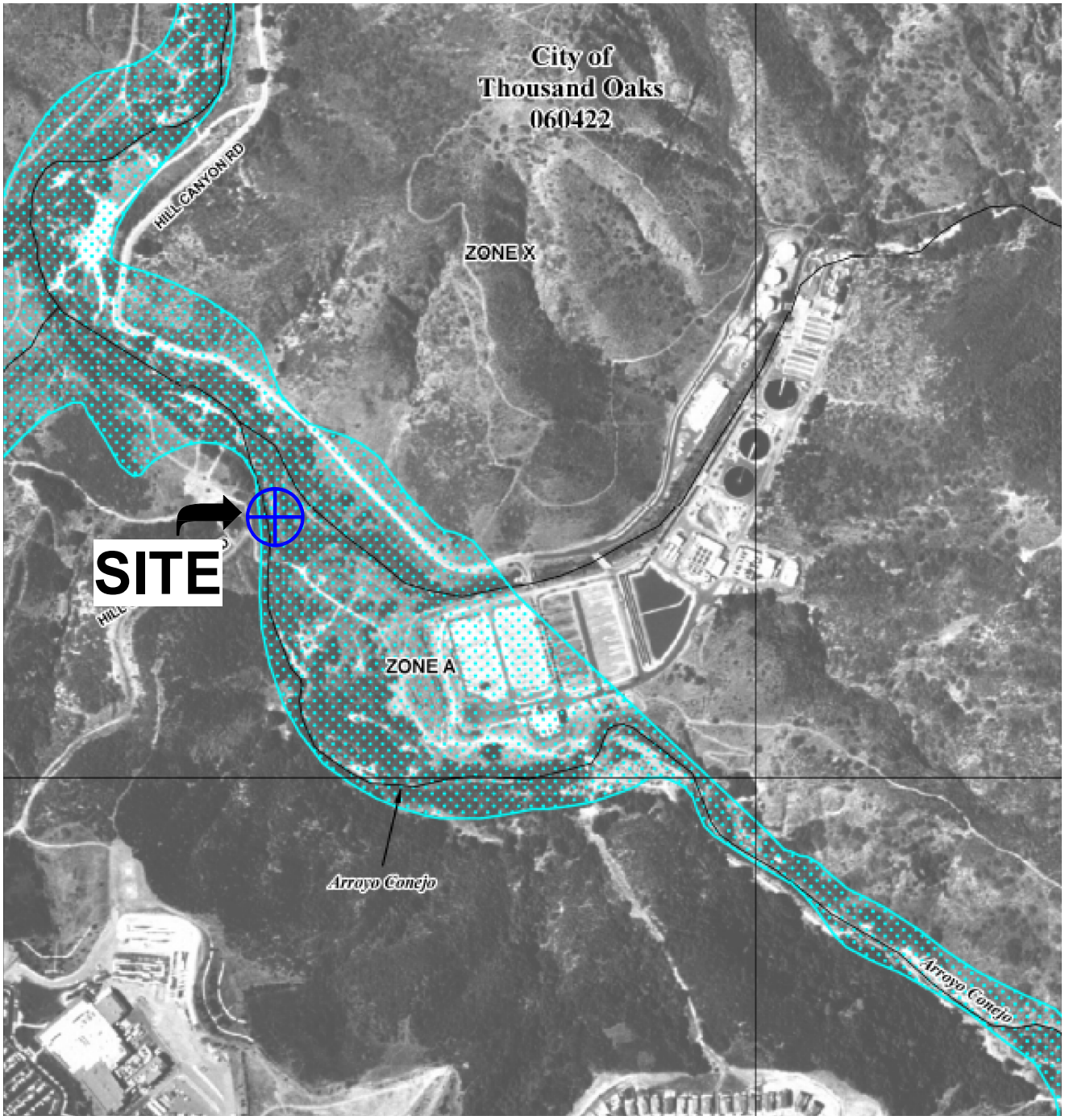
SEISMIC HAZARD ZONES

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 6



APPROXIMATE SCALE

350 0 500 1000 FEET

150 0 150 300 METERS

N

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

Reference: Federal Emergency Management (2010)

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FLOOD INSURANCE RATE MAP

HCTP Secondary Access Bridge
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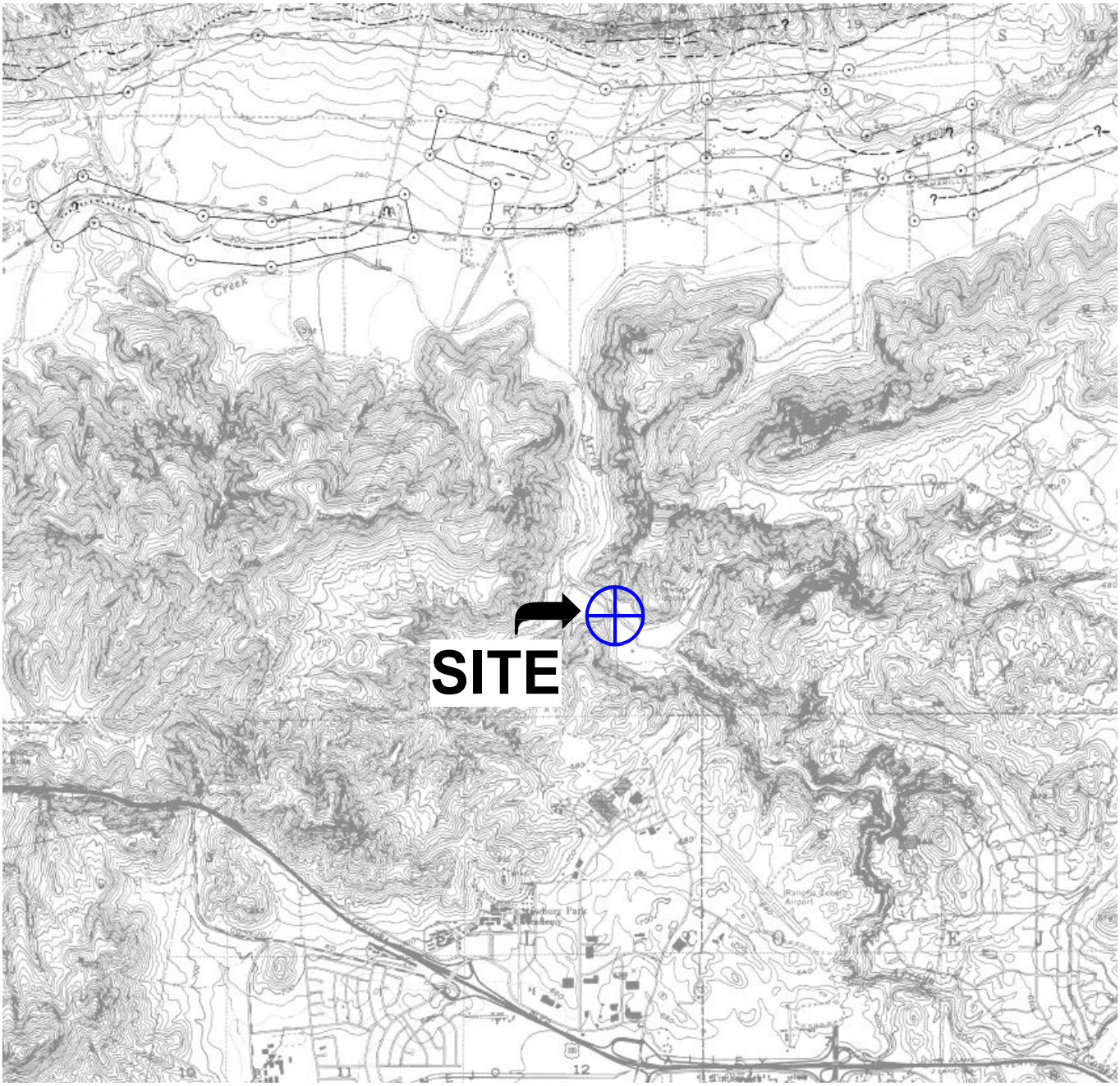
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 7
181010.4	January 2019	



APPROXIMATE SCALE

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

N

Reference: California Department of Conservation, Division of Mines and Geoogy (1999)

LEGEND

Active Faults

Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

Earthquake Fault Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define Earthquake Fault Zone segments.

Seaward projection of zone boundary.

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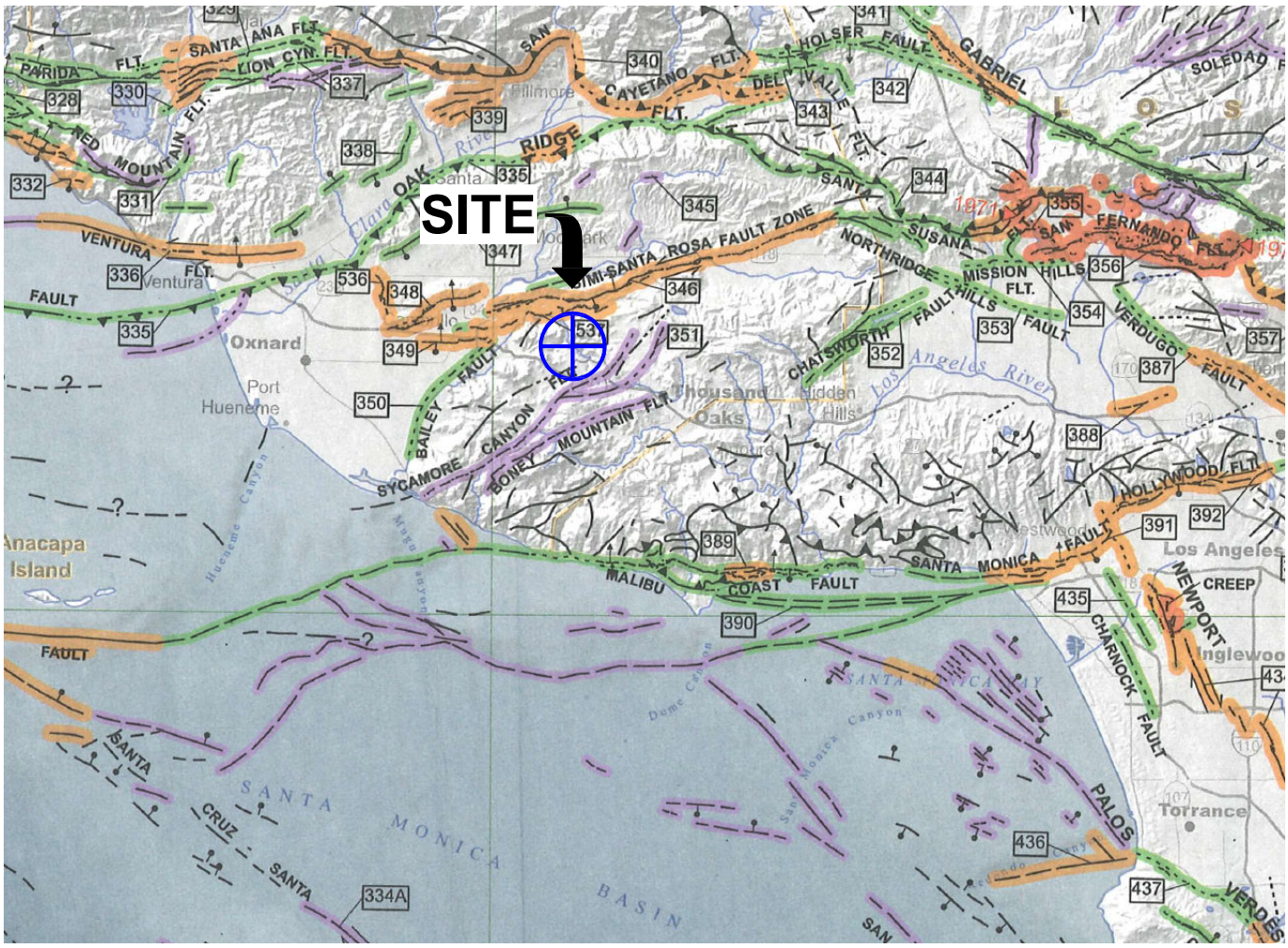
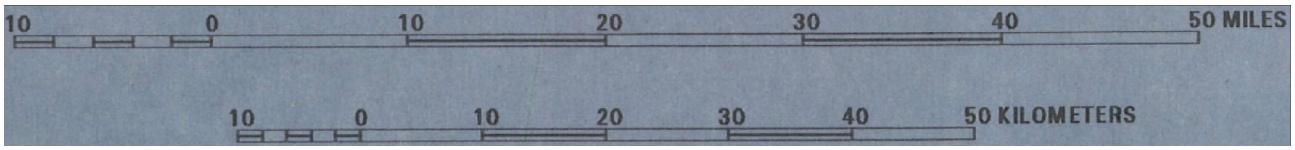
EARTHQUAKE FAULT ZONES MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 8
181010.4	January 2019	



APPROXIMATE SCALE



N

Reference: Jennings (2010)

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FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
181010.4	January 2019	PAGE 1 OF 3

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

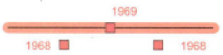
(c) displaced survey lines.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.



Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

Reference: Jennings (2010)

TWINING

FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
181010.4	January 2019	PAGE 2 OF 3

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200		?	Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700		?	Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000		?	Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

Reference: Jennings (2010)

TWINING

FAULT LOCATION MAP

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE 9
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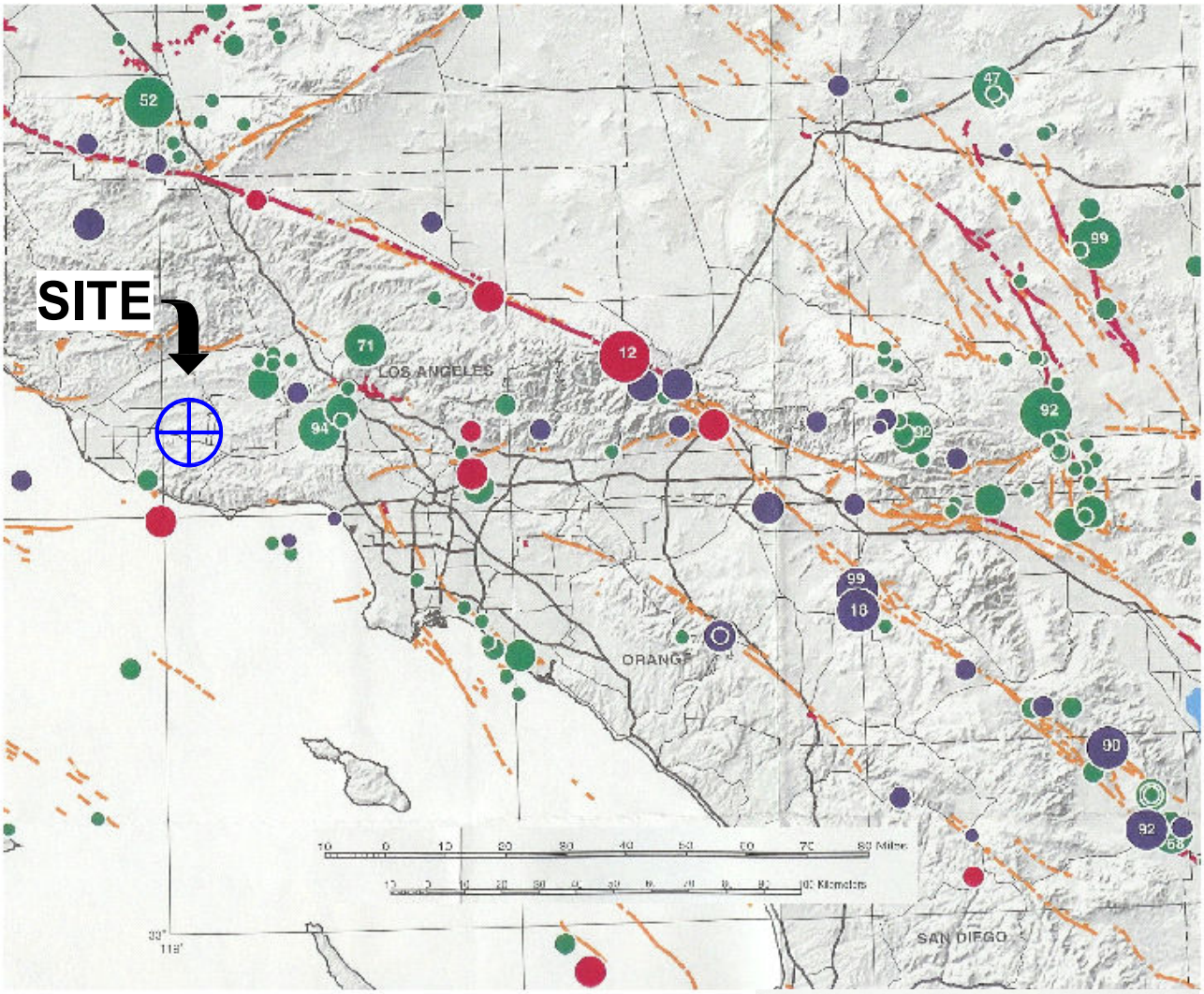
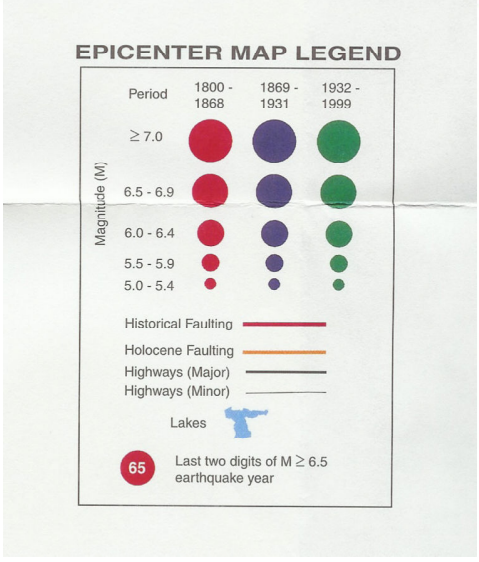




N

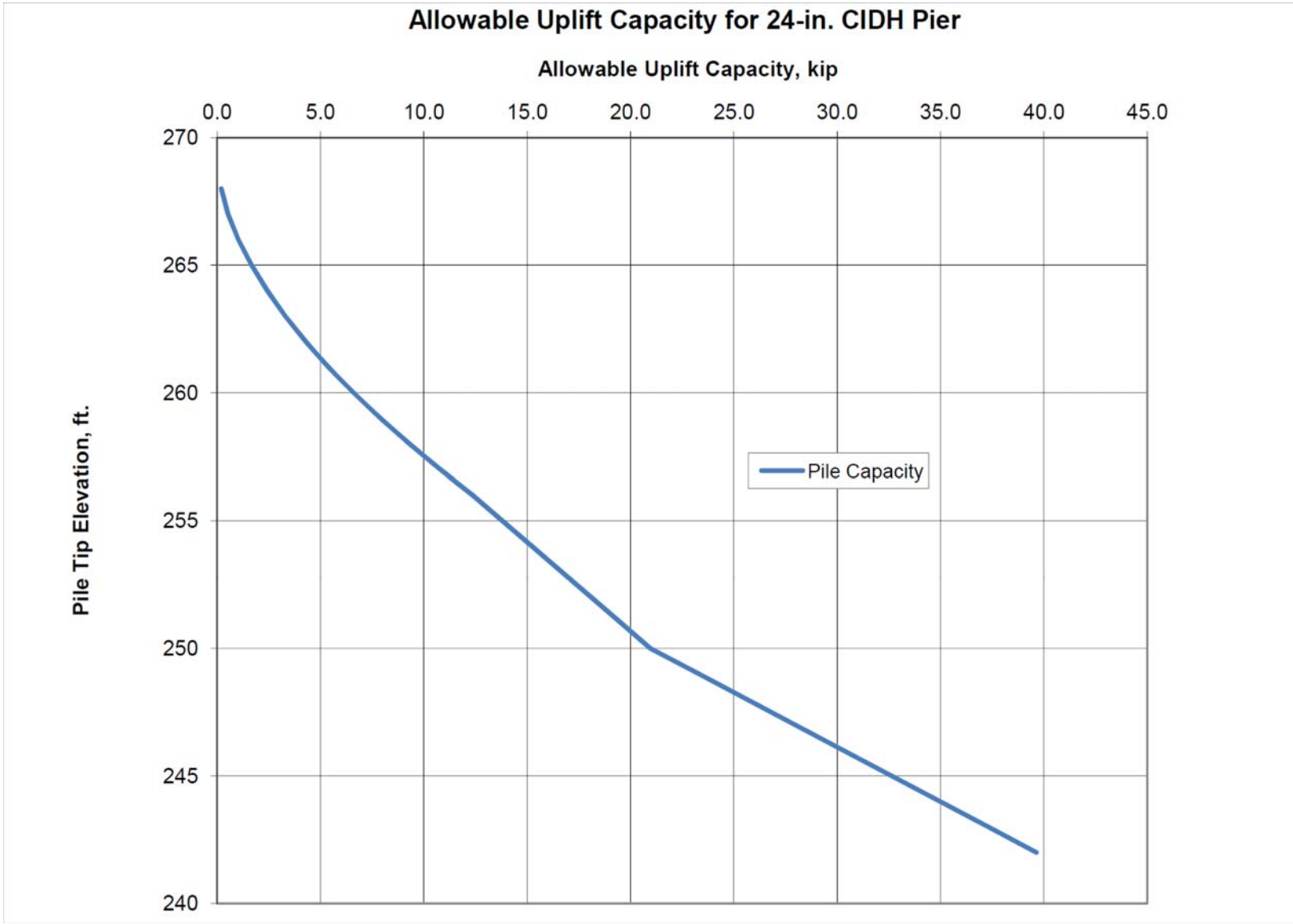
Reference: Toppozada et al. (2000)

TWINING

HISTORICAL SEISMICITY, 1800 - 1999

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 10



TWINING

ALLOWABLE UPLIFT CAPACITY

HCTP Secondary Access Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	FIGURE 11

Appendix A
Field Exploration

Appendix A
Field Exploration

General

The initial subsurface exploration program for the proposed project consisted of drilling and logging three eight-inch-diameter hollow-stem-auger exploratory borings. The borings were advanced with a mobile B-80 drill rig. Drilling was performed by Badger Drilling of Oxnard, California.

The borings reached depths of approximately 5 to 38 feet below the existing grades. Upon completion of the borings, the boreholes were backfilled with soil from the cuttings.

Drilling and Sampling

The Boring Logs are presented as Figures A-2 through A-4. An explanation of these logs is presented as Figure A-1. The Boring Logs describe the earth materials encountered, samples obtained, and show the field and laboratory tests performed. The log also shows the boring number, drilling date, and the name of the logger and drilling subcontractor. The borings were logged by a Twining engineer/geologist using the Unified Soil Classification System. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Drive and bulk samples of representative earth materials were obtained from the borings.

A California modified sampler was used to obtain drive samples of the soil encountered. This sampler consists of a 3-inch outside diameter (O.D.), 2.4-inch inside diameter (I.D.) split barrel shaft that is driven a total of 18-inches into the soil at the bottom of the boring. The soil was retained in brass rings for laboratory testing. Additional soil from each drive remaining in the cutting shoe was usually discarded after visually classifying the soil. The number of blows required to drive the sampler the final 12 inches is presented on the boring logs.

Disturbed samples were obtained using a Standard Penetration Sampler (SPT). This sampler consists of a 2-inch O.D., 1.4-inch I.D. split barrel shaft that is advanced into the soil at the bottom of the drilled hole a total of 18 inches. The number of blows required to drive the sampler the final 12 inches is presented on the boring logs. Soil samples obtained by the SPT were retained in plastic bags.

Both the California modified and the SPT sampler were driven by an automatic-trip hammer weighing 140 pounds at a drop height of approximately 30 inches.

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
	SPT	1.4 in I.D., 2.0 in. O.D. driven sampler
	California Modified	2.4 in. I.D., 3.0 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

TWINING

EXPLANATION FOR LOG OF BORINGS

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A-1

STANDARD LOG EXPLANATION 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED 11/8/11 | LOGGED BY NJN | **BORING NO. B-1**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) 32

DRILLING METHOD 8" HSA | DRILLER Badger Drilling | SURFACE ELEVATION (ft.) 278 +(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
						WASH, ATT, EI, CORR, MAX, DS		SC	Loose gravel ground cover; up to 2 inches in diameter FILL: CLAYEY SAND WITH GRAVEL, dark brown, moist, medium dense; trace gravel up to 0.5 inches in diameter -easy drilling
273	5		17	11.5	100.7	DS		SM	ALLUVIUM: SILTY SAND, dark yellow brown, moist, medium dense; trace pieces of basalt from coarse sand to fine gravel; white veinlets gravel layer
268	10		33	4.9	112.7	WASH, ATT, C			
263	15		27	10.7	104.8				dense; trace cobbles; difficult drilling
258	20		31						yellow brown; piece of basalt up to 3 inches in diameter; increase plasticity
253	25		37	19.8	101.0	WASH, ATT, DS		CH	SANDY FAT CLAY, dark brown, moist; very stiff; white veinlets; trace pieces of basalt up to 1 inch in diameter
248	30		25						▼
								SP	POORLY GRADED SAND WITH CLAY, yellow brown, wet, very dense; fine- to coarse-grained sand; pieces of gravel up to 1 inch in diameter
243	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 2 Sheet 1 of 2

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	11/8/11	LOGGED BY	NJN	**BORING NO.**	B-1
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	32
DRILLING METHOD	8" HSA	DRILLER	Badger Drilling	SURFACE ELEVATION (ft.)	278 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
			57					SP	POORLY GRADED SAND WITH CLAY, yellow brown, wet, very dense; fine- to coarse-grained sand; pieces of gravel up to 1 inch in diameter *(continued)*
			50/6						
238	40								REFUSAL Total Depth = 38.0 feet Backfilled on 11/8/2011 Groundwater encountered at 32 feet Water level rose to 29' after 20 minutes Backfilled with soil cuttings
233	45								
228	50								
223	55								
218	60								
213	65								
208	70								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 2 Sheet 2 of 2

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED 11/8/11 | LOGGED BY NJN | **BORING NO. B-2**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) not encountered

DRILLING METHOD 8" HSA | DRILLER Badger Drilling | SURFACE ELEVATION (ft.) 278 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
								CL	FILL: LEAN CLAY, yellow brown, moist
								SM	ALLUVIUM: SILTY SAND, yellow brown, moist, medium dense
273	5								REFUSAL Total Depth = 5.0 feet Backfilled on 11/8/2011 Groundwater not encountered Backfilled with soil cuttings
268	10								
263	15								
258	20								
253	25								
248	30								
243	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 3 Sheet 1 of 1

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	11/8/11	LOGGED BY	NJN	**BORING NO.**	B-3
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	not encountered
DRILLING METHOD	8" HSA	DRILLER	Badger Drilling	SURFACE ELEVATION (ft.)	287 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
								CL	FILL: LEAN CLAY, yellow brown, moist
								SM	ALLUVIUM: SILTY SAND, yellow brown, moist, medium dense
			33	13.7	99.6	WASH, ATT, DS			dark gray brown, moist; silty yellow and red patches; trace medium grained sand; pieces of weathered basalt
282	5		52/8	8.6	115.1	WASH, ATT, C			very dense weathered basalt
									REFUSAL at bedrock Total Depth = 8.0 feet Backfilled on 11/8/2011 Groundwater not encountered Backfilled with soil cuttings
277	10								
272	15								
267	20								
262	25								
257	30								
252	35								

TWINING

LOG OF BORING

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	A - 4 Sheet 1 of 1

BORING LOG 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 24/1/12

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-4
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	18
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
					GS, Att		CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel
5		12	23.4	73.3				Lean CLAY; medium stiff; dark brown; moist to wet
								-- drilling becomes more difficult
10		24	20.7	97.7				-- hard
15		23	26.5	97.5				-- same
								▼
20		19						-- groundwater encountered at 22 feet during drilling
25		21	20.4	106.2	DS			-- samples saturated
30		28						Sandy lean CLAY; hard; dark gray to brown; saturated; few GRAVEL
35								

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 2

DATE DRILLED 12/19/18 | LOGGED BY JT | **BORING NO. B-4**

DRIVE WEIGHT 140 lbs. | DROP 30 inches | DEPTH TO GROUNDWATER (ft.) 18

DRILLING METHOD 6" HSA | DRILLER Baja Drilling | SURFACE ELEVATION (ft.) N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
40		31					CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel *(continued)*
								-- very hard
		50/4"						CONEJO VOLCANICS: Conejo Volcanics Bedrock; very hard; light gray; wet -- difficulty drilling; boring terminated due to refusal
45								Total Depth = 43.3 feet Backfilled on 12/19/2018 Borehole terminated due to refusal at approximately 43.5 feet bgs. Groundwater recorded at approximate depth of 18 feet at the completion of drilling. Borehole backfilled with soil from cuttings.
50								
55								
60								
65								
70								

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 2

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-5
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	20
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A +(MSL)

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
0						CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel
5							Lean CLAY; medium stiff; dark brown; moist to wet
10							
15							
20							▼ -- groundwater encountered at depth of 20 feet during drilling
25							
30							Sandy lean CLAY; dark brown to gray; saturated; some GRAVEL
35							

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 3

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

DATE DRILLED	12/19/18	LOGGED BY	JT	**BORING NO.**	B-5
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	20
DRILLING METHOD	6" HSA	DRILLER	Baja Drilling	SURFACE ELEVATION (ft.)	N/A ±(MSL)

DEPTH (feet)	SAMPLES: Bulk	SAMPLES: Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
40							CL	ALLUVIUM: Sandy lean CLAY; medium stiff; dark brown; moist; few gravel *(continued)* -- same
45								CONEJO VOLCANICS: Conejo Volcanics Bedrock encountered; boring terminated due to refusal Total Depth = 45.0 feet Backfilled on 12/19/2018 Borehole terminated due to refusal at approximately 45 feet bgs. Groundwater recorded at approximate depth of 20 feet at the completion of drilling. Borehole backfilled with soil from cuttings.
50								
55								
60								
65								
70								

TWINING

LOG OF BORING

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	A - 3

BORING LOG 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/15/19

Appendix B

Laboratory Testing

Appendix B
Laboratory Testing

Laboratory Moisture Content and Density Tests

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

Wash Sieve

The amount of fines passing the No. 200 sieve was evaluated by the wash sieve on selected soil samples. The test procedure was in general accordance with ASTM D 1140. The test results are presented in Table B-2.

Atterberg Limits

Plasticity index testing was performed on selected samples obtained from the borings to evaluate plasticity characteristics and to aid in the classification of the soil. The tests were performed in general accordance with ASTM D 4318. The results are presented on Figure B-1, Atterberg Limits.

Direct Shear Tests

Direct shear tests were performed on selected 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 presented on Figures B-2 through B-5.

Consolidation Tests

Consolidation tests were performed on selected relatively undisturbed soil samples in general accordance with the latest version of ASTM D 2435. 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 test are presented on Figures B-6 through B-7.

Expansion Index Tests

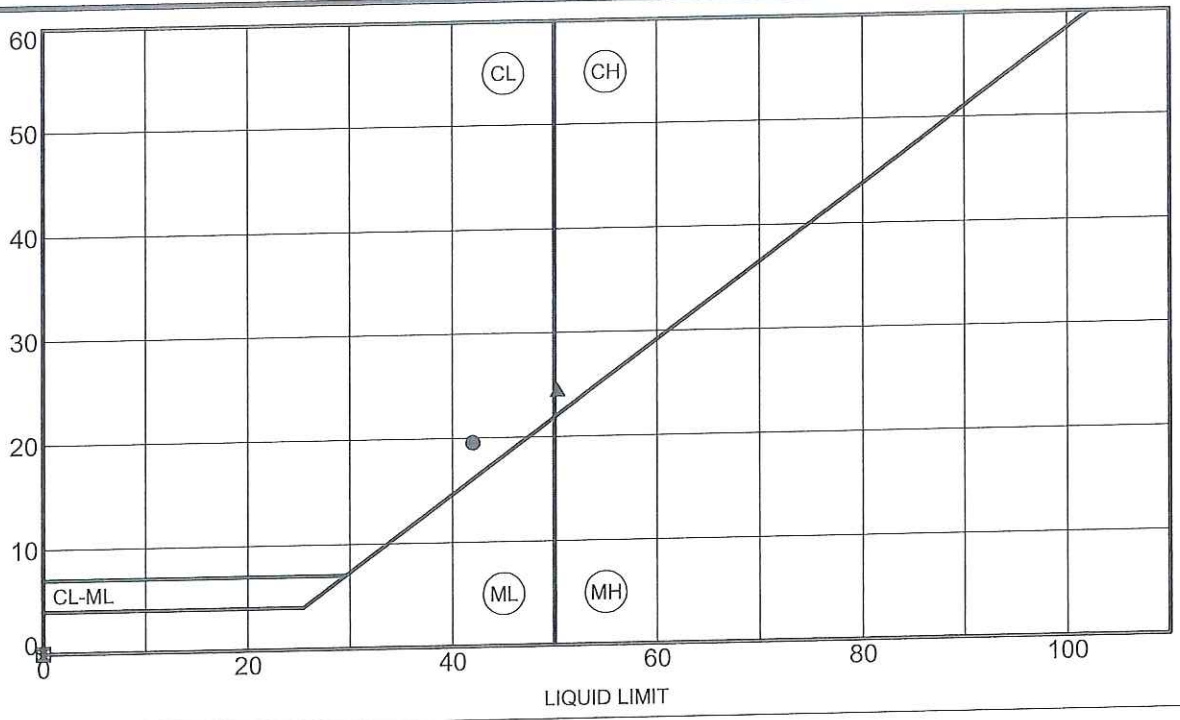
The expansion index of was evaluated in general accordance with ASTM D 4829. The specimen was molded under a specified compactive energy at approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of Expansion Index tests are presented on Table B-3.

Maximum Dry Density-Optimum Moisture Content

A selected bulk sample was tested to evaluate the maximum dry density and its optimum moisture content. The test was performed in general accordance with ASTM test method D 1557. The results are presented on Figure B-8.

Corrosivity

Soil pH and resistivity tests were performed by Anaheim Test Laboratories on a representative soil sample in general accordance with the latest version of California Test Method 643. The chloride content of a selected sample was evaluated in general accordance with the latest version of California Test Method 422. The sulfate content of a selected sample was evaluated in general accordance with the latest version of California Test Method 417. The test results are presented on Table B-4.



	Sample Location	LL	PL	PI	U.S.C.S. Classification
●	B-1 at 0-5 ft	42	22	20	CLAYEY SAND WITH GRAVEL
⊠	B-1 at 10 ft	NP	NP	NP	SILTY SAND
▲	B-1 at 25 ft	50	26	24	SANDY FAT CLAY
★	B-3 at 3 ft	NP	NP	NP	SILTY SAND
⊙	B-3 at 5 ft	NP	NP	NP	SILTY SAND

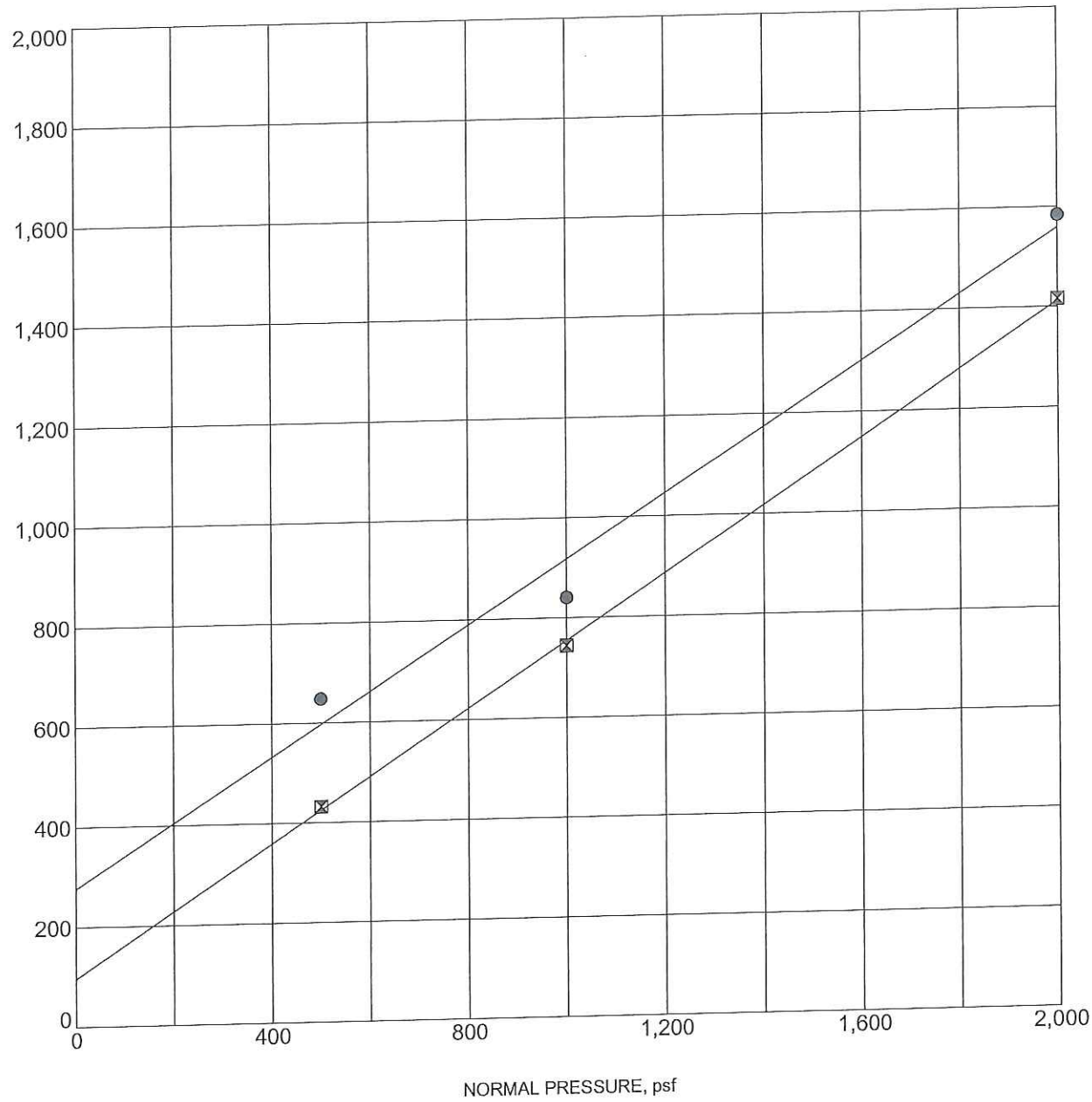
TWINING

ATTERBERG LIMITS

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-1

ATTERBERG LIMITS 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	275	95
Friction Angle, Ø (deg):	33	33

Boring No.: B-1
Sample Depth (ft): 0-5
Sample Description: CLAYEY SAND WITH GRAVEL
Strain Rate (in./min): 0.005
Dry Density (pcf): 105.7

Initial Moisture (%): 14.8
Final Moisture (%): 20.9

Remolded to 90 percent of the maximum dry density (ASTM D 1557)

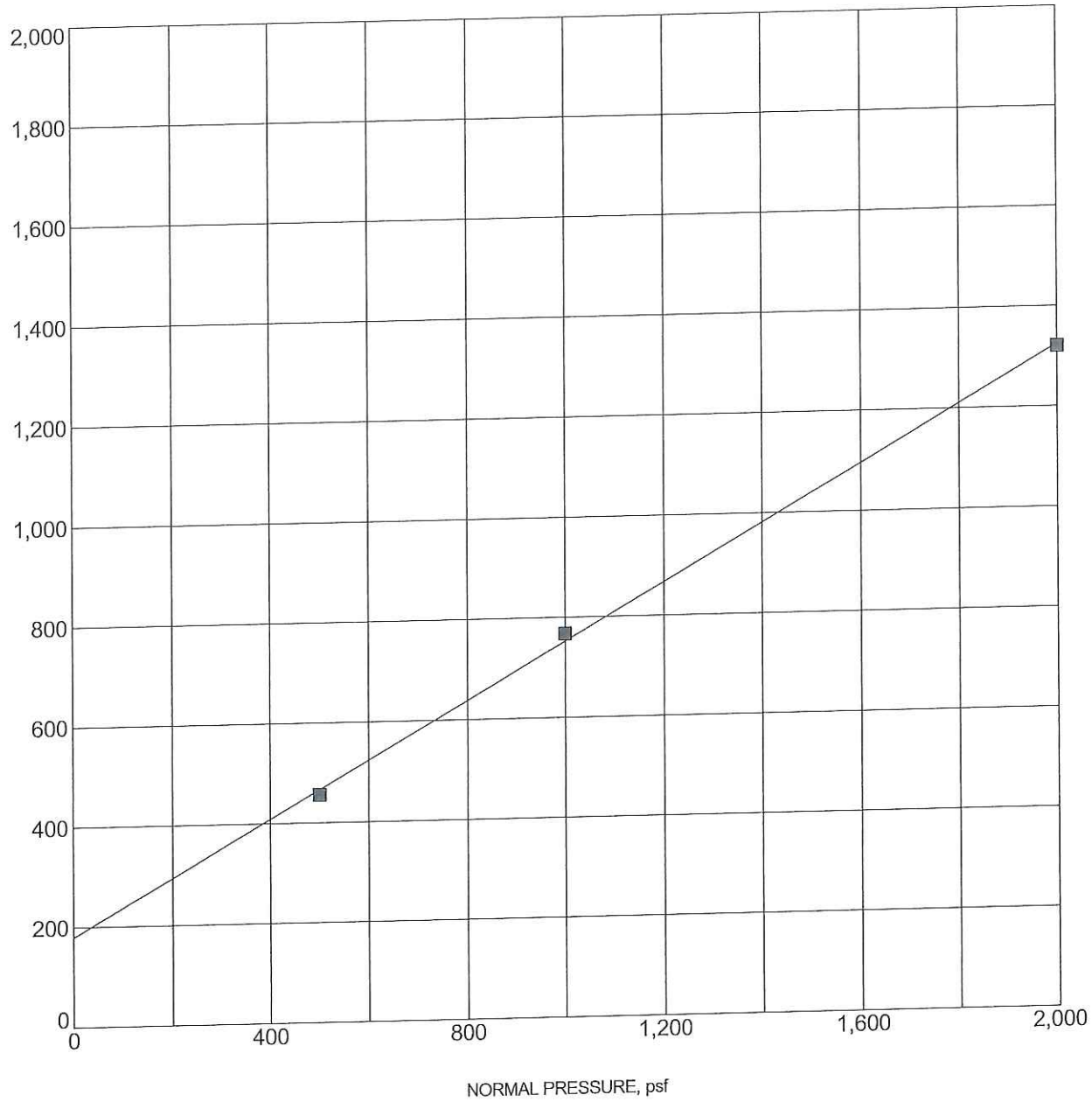
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-2

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-1
Sample Depth (ft):	5
Sample Description:	CLAYEY SAND
Strain Rate (in./min):	0.005
Dry Density (pcf):	100.7

Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	180	180
Friction Angle, Ø (deg):	30	30

Initial Moisture (%): 11.5
Final Moisture (%): 22.5

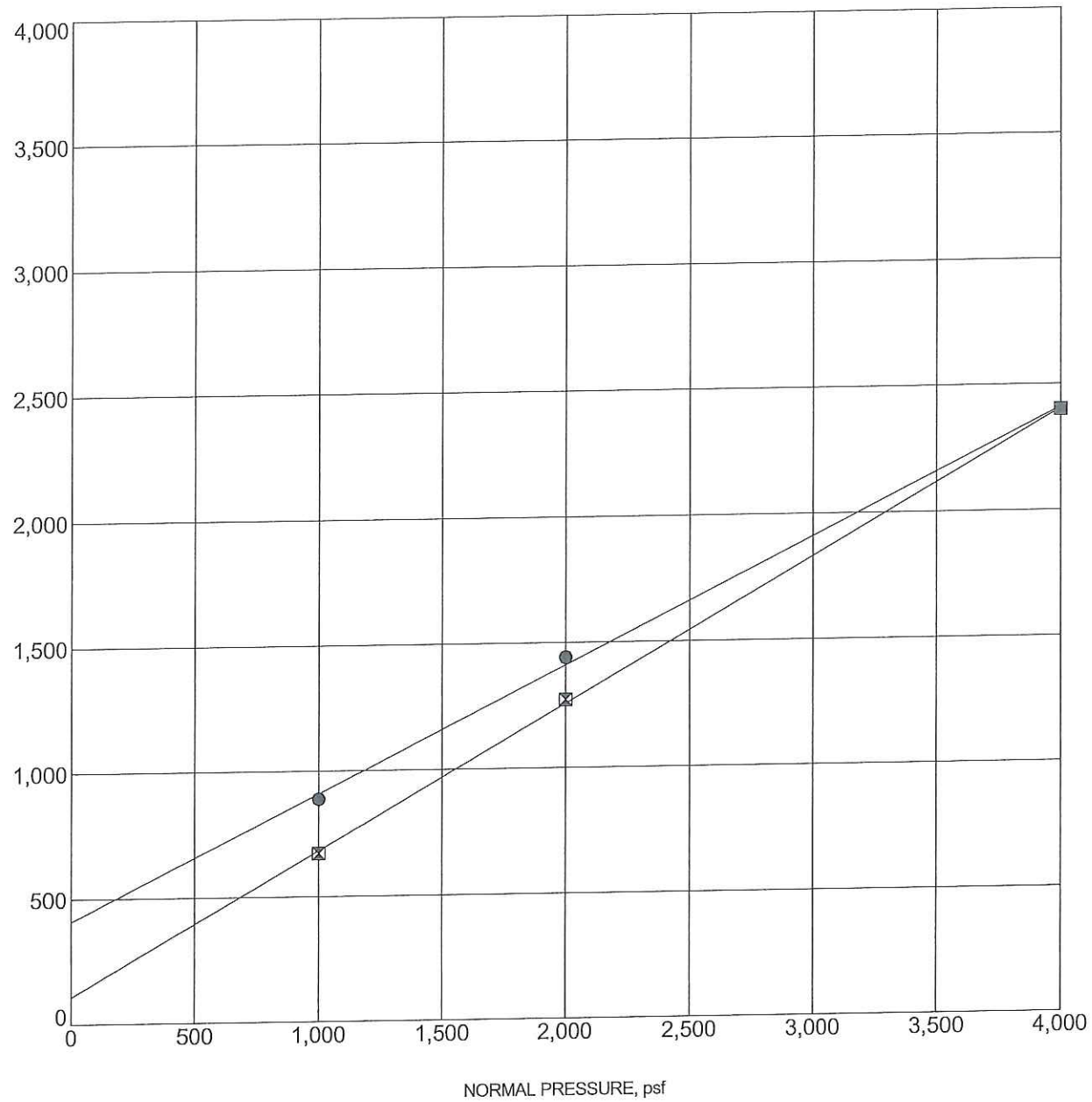
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-3

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-1
Sample Depth (ft):	25
Sample Description:	SANDY FAT CLAY
Strain Rate (in./min):	0.005
Dry Density (pcf):	101.0

Shear Strength Parameters

	Peak —●—	Ultimate —⊠—
Cohesion, C (psf):	410	110
Friction Angle, Ø (deg):	27	30

Initial Moisture (%): 19.8
Final Moisture (%): 26.6

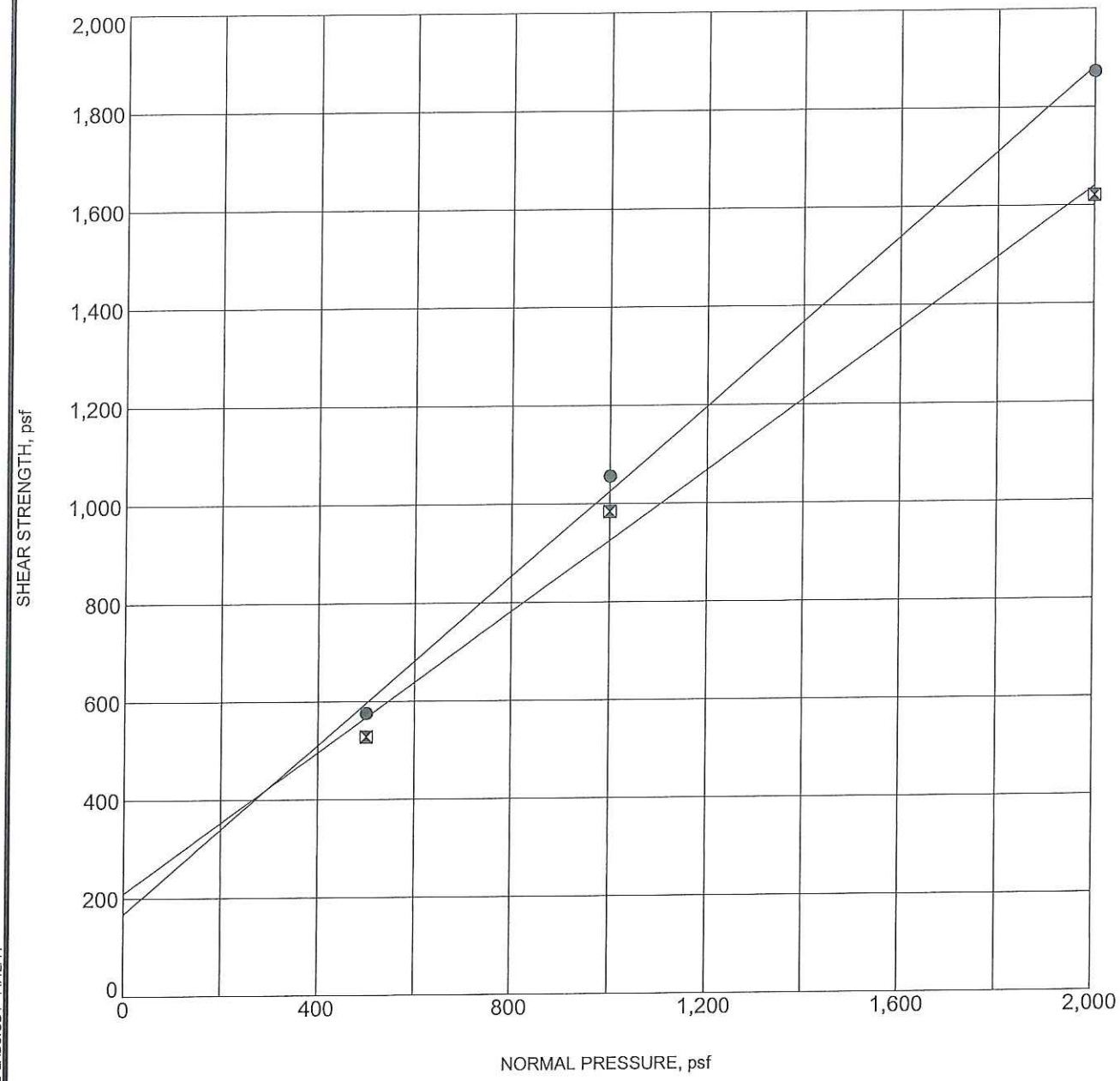
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-4

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Boring No.:	B-3
Sample Depth (ft):	2.5
Sample Description:	SILTY SAND
Strain Rate (in./min):	0.005
Dry Density (pcf):	99.6

Shear Strength Parameters

	Peak —●—	Ultimate —⊠—
Cohesion, C (psf):	170	210
Friction Angle, Ø (deg):	41	36

Initial Moisture (%): 13.7
Final Moisture (%): 28.2

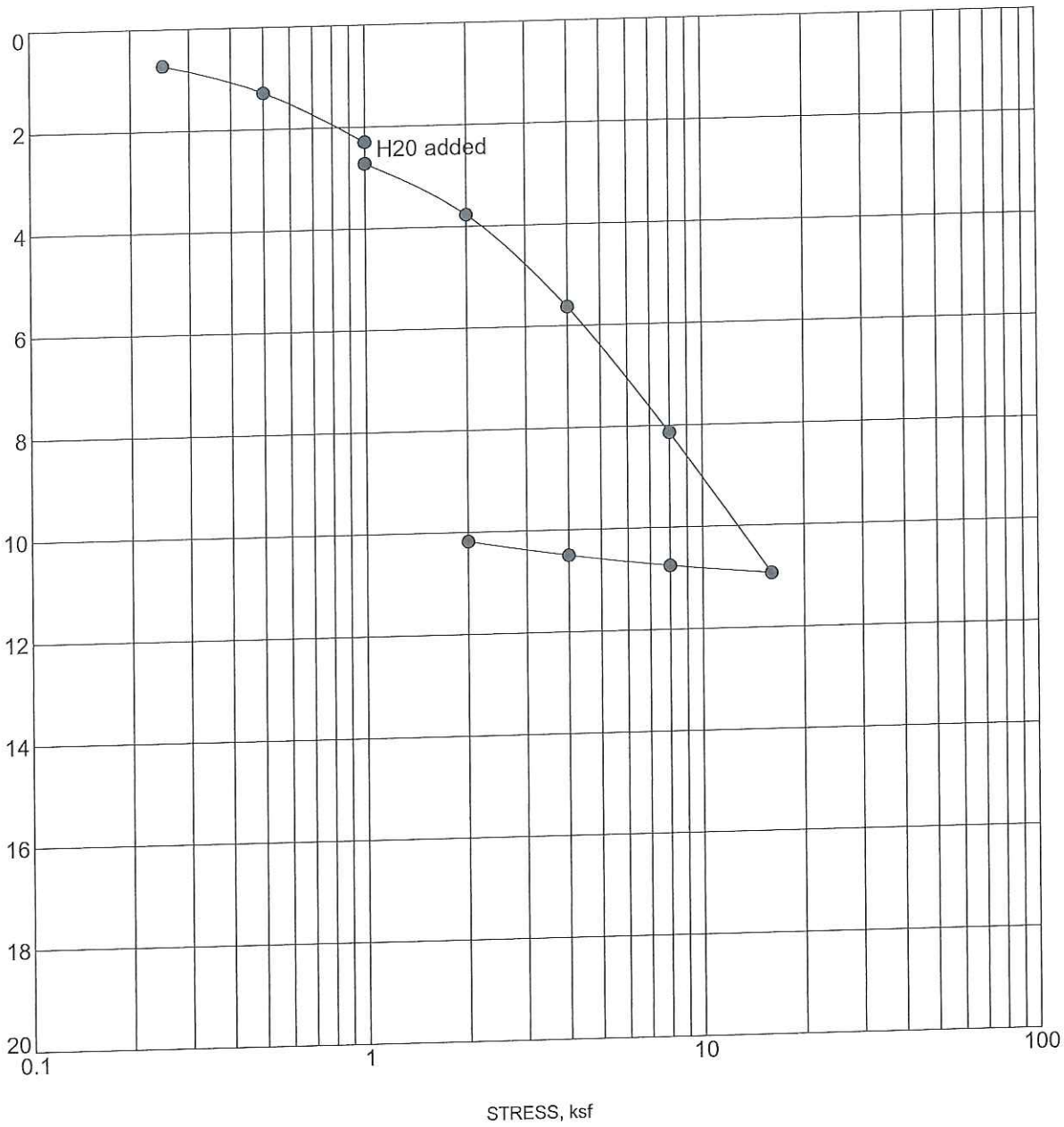
TWINING

DIRECT SHEAR TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-5

DIRECT SHEAR 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	Soil Description	Dry Density (pcf)	Moisture Content (%)
● B-1 at 10 ft	**SILTY SAND**	**111.0**	**4.9**

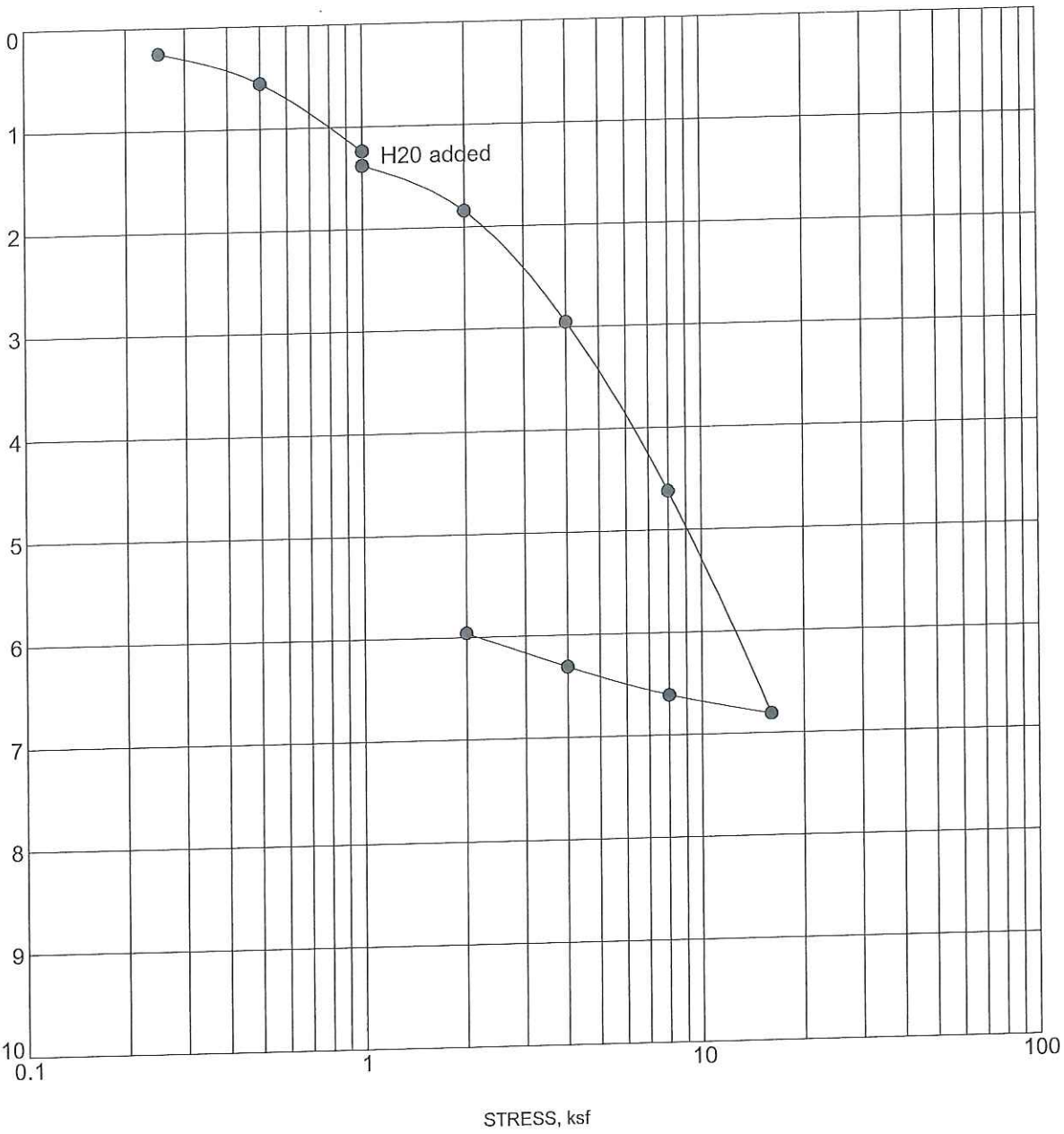
TWINING

CONSOLIDATION TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-6

CONSOL STRAIN 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	Soil Description	Dry Density (pcf)	Moisture Content (%)
● B-3 at 5 ft	**SILTY SAND**	**102.9**	**8.6**

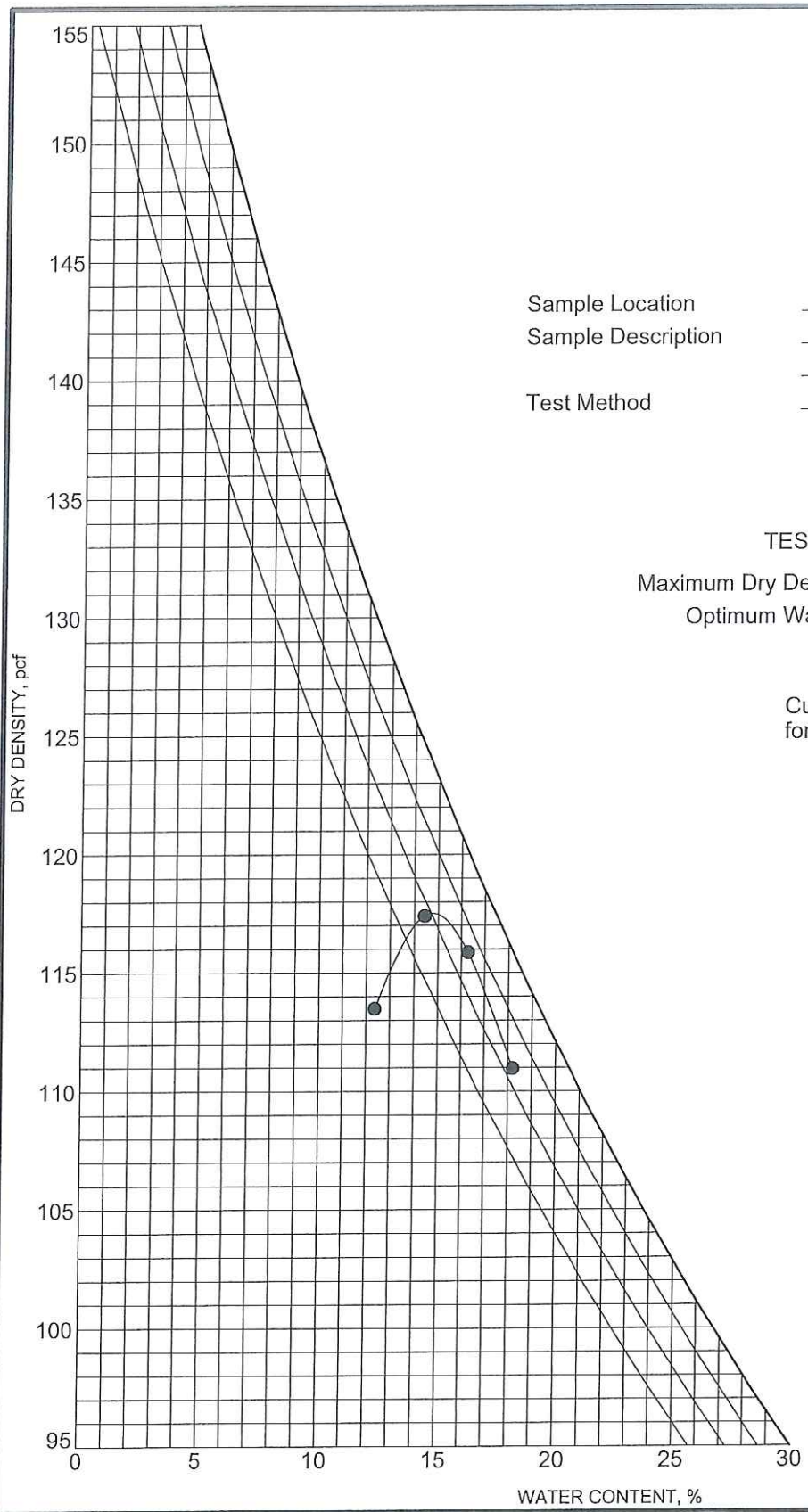
TWINING

CONSOLIDATION TEST

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-7

CONSOL STRAIN 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11



Sample Location	B-1 at 0-5 ft
Sample Description	CLAYEY SAND WITH GRAVEL
Test Method	ASTM D1557 Method A

TEST RESULTS

Maximum Dry Density	117.5 pcf
Optimum Water Content	14.8 %

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

2.50

TWINING

MOISTURE-DENSITY RELATIONSHIP

HCTP Secondary Access Bridge
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
110829.4	December 2011	B-8

COMPACTION 110829.4 HCTP SECONDARY ACCESS BRIDGE.GPJ TWINING LABS.GDT 14/12/11

TWINING

Report of Soil Testing

To: Bulk Sample for Scour Determination

Project Name: Conejo Canyon Bridge

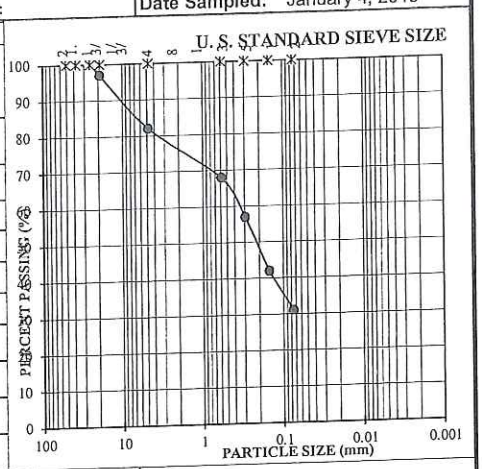
Project Number: 181010.4

Lab Number:

Sample Data:
Bulk sample from the stream

Date Sampled: January 4, 2019

Wet Wt:				
Dry Wt:	67926.0			
Sieve Size	Wt. (Grams)	% Retained	% Passing	% Passing
6 inch (150 mm)	0	0	100	100
5 inch (125 mm)	4917	7.2	92.8	93
4 inch (100 mm)	16540	24.4	75.6	76
3 inch (75 mm)	28645	42.2	57.8	58
2 1/2 inch (62.5 mm)	37661	55.4	45.6	46
2 inch (50 mm)	39296	57.9	42.1	42
1-1/2 inch (37 mm)	40931	60.3	39.7	40
1 inch (25 mm)	44002	64.8	35.2	35
3/4 inch (19 mm)	45196	66.5	33.5	34
1/2 inch (12.5 mm)	46810	68.9	31.1	31
3/8 inch (9.5 mm)	47824	70.4	29.6	30
#4 (4.75 mm)	49532	72.9	27.1	27
Weight Passing #4 sieve				
716.4				
#8 (2.36 mm)	148.3	20.7	79.3	22
#16 (1.18 mm)	319.2	44.6	55.4	15
#30 (0.6 mm)	526.9	73.5	26.5	7
#50 (0.3 mm)	644.3	89.9	10.1	3
#100 (0.15 mm)	673.3	94.0	6.0	2
#200 (0.075 mm)	683.1	95.4	4.6	1.2

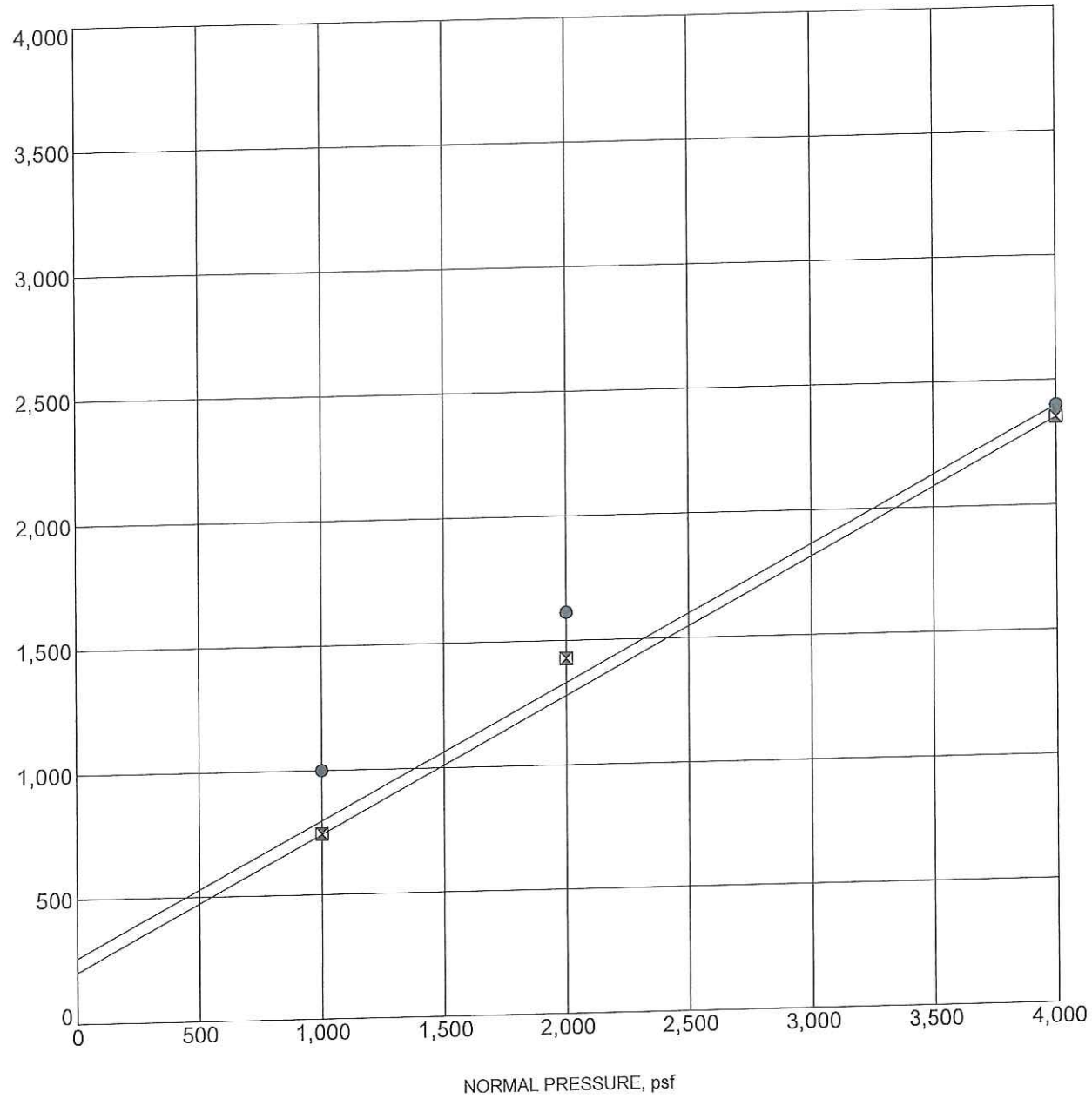


Tested in Accordance with Caltrans CTM:202

Technician: Glenn Taylor Date: January 8, 2019

Reviewed By: Glenn Taylor Date: January 8, 2019
Laboratory Manager

Twining Inc. 1879 Portola Road Suite G Ventura, Ca. 93003
Office:805-644-85100 Fax: 805-644-5179 Web: Twininginc.com



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	250	200
Friction Angle, Ø (deg):	28	28

Boring No.: B-4
Sample Depth (ft): 25
Sample Description: Lean Clay
Strain Rate (in./min): 0.005
Dry Density (pcf): 106.2

Initial Moisture (%): 20.4
Final Moisture (%): 20.4

TWINING

DIRECT SHEAR TEST

Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	REPORT DATE	FIGURE
181010.4	January 2019	B-1

DIRECT SHEAR 181010.4 - HILL CANYON BRIDGE.GPJ TWINING LABS.GDT 1/16/19

Twining Inc
1879 Portola Rd., Suite G, Ventura, CA 93003
Ph: 805.644.5100
Fax: 562.426.6424
www.twininginc.com

Material Test Report

Report No: MAT:W01-18-29559-S1
Printed Date: 1/14/2019 Issue No: 1

Customer:	Stantec 111 E. Victoria Street Santa Barbara, CA 93101
Project:	Hill Canyon Bridge 9600 Santa Rosa Road Camarillo, CA 93012

Project No: 181010.4
Permit No:
OSHPD:
DSA File #:
DSA AP #:

Jurisdiction:
Distribution List:

Approved by: Adrian Moreno
Senior Staff Engineer

Sample Details

Sampled By: J. Tawakoli
Date Sampled: 12/18/2018
Sample Location: Boring B-4 at 0-5 feet depth
Test Specification: CTM 301

Date Received: 12/20/2018
Material Description: Lean Clay

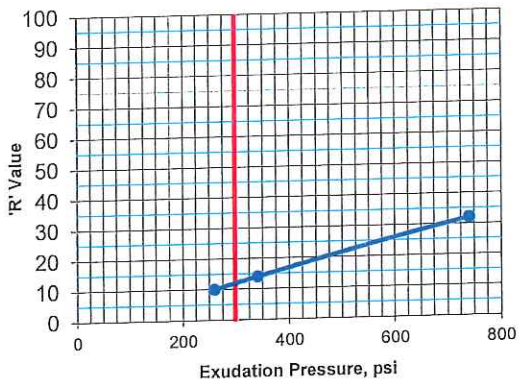
Test Details

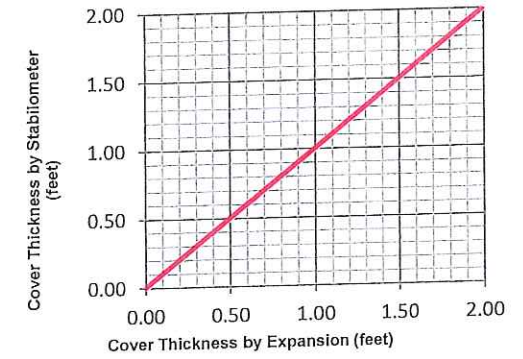
Date Tested: 12/26/2018 Tested By: B. Vollnogle

GRADING ANALYSIS, % Passing

Sieve Size		"As Received"	"As Used"
2"	50 mm	100	
1-1/2"	37.5 mm	100	100
1"	25 mm	100	100
3/4"	19.5 mm	100	100
3/8"	9.5 mm	100	
#4	4.75 mm	100	

TEST SPECIMEN DATA	A	B	C
Compactor Air Pressure (psi)	100	300	150
Initial Moisture Content	10.9%	10.9%	10.9%
Water Added (mL)	60.0	30.0	45.0
Final Moisture Content	17.0%	14.0%	15.5%
Sample Height (in)	2.69	2.57	2.61
Net Sample Weight (g)	1152.7	1126.0	1139.0
Dry Density (pcf)	111.0	116.6	114.6
Exudation Load (lbs)	3262	9312	4276
Exudation Pressure (psi)	260	741	340
Expansion Dial (x 0.0001)			
Expansion Pressure (psf)			
P_h at 1000lbs (psi)	56	37	53
P_h at 2000lbs (psi)	134	96	127
Displacement (turns)	3.88	3.46	3.63
R' Value	11	33	15
Corrected 'R' Value	10	32	14
Stabilometer Thickness (ft)			
Expansion Press. Thickness (ft)			





TI =
Gf =
R-Value by Exudation Pressure: 14
R-Value by Expansion Pressure: —

Compliance:

Comments

Table B-1
Laboratory Moisture Content and Dry Density

Boring No.	Depth (feet)	Moisture Content (%)	Dry Unit Weight (pcf)
B-1	5	11.5	100.7
B-1	10	4.9	112.7
B-1	15	10.7	104.8
B-1	25	19.8	101.0
B-3	2.5	13.7	99.6
B-3	5	8.6	115.1

Table B-2
No. 200 Wash Sieve Results

Boring No.	Depth (feet)	Percent Passing #200
B-1	0-5	34.2
B-1	10	16.0
B-1	25	52.1
B-3	2.5	40.4
B-3	5	33.5

Table B-3
Expansion Index Test Result

Boring No.	Depth (feet)	Expansion Index
B-1	0-5	60

Table B-5
Corrosivity Test Results

Boring No.	Depth (feet)	pH	Water Soluble Sulfate (%)	Water Soluble Chloride (%)	Minimum Resistivity (ohm-cm)
B-1	0-5	6.7	0.0066	0.0099	788

Appendix C

Seismic Refraction Survey

SEISMIC REFRACTION SURVEY
HILL CANYON TREAMENT PLANT
CAMARILLO, CALIFORNIA

PREPARED FOR:
Twining, Inc.
1879 Portola Road, Suite G
Ventura, CA 93003

PREPARED BY:
Southwest Geophysics, Inc.
8057 Raytheon Road, Suite 9
San Diego, CA 92111

November 25, 2011
Project No. 111360

SOUTHWEST GEOPHYSICS, INC.

YOUR SUBSURFACE SOLUTION

November 25, 2011
Project No. 111360

Mr. Nicholas Novoa
Twining, Inc.
1879 Portola Road, Suite G
Ventura, CA 93003

Subject: Seismic Refraction Survey
Hill Canyon Treatment Plant
Camarillo, California

Dear Mr. Novoa:

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed bridge construction project at the Hill Canyon Treatment Plant in Camarillo, California. Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. This data report presents our survey methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Sincerely,
SOUTHWEST GEOPHYSICS, INC.

Patrick Lehrmann

Patrick Lehrmann, P.G., P.Gp.
Principal Geologist/Geophysicist

Hans van de Vrugt

Hans van de Vrugt, C.E.G., P.Gp.
Principal Geologist/Geophysicist

PFL/HV/hv

Distribution: (1) Electronic

8057 Raytheon Road, Suite 9 • San Diego • California 92111 • Telephone 858-527-0849 • Fax 858-225-0114

TABLE OF CONTENTS

1. INTRODUCTION

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed bridge construction project at the Hill Canyon Treatment Plant in Camarillo, California (Figure 1). Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed. This data report presents our survey methodology, equipment used, analysis, and results.

2. SCOPE OF SERVICES

Our scope of services included:

- Performance of two seismic refraction lines at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results, conclusions and recommendations.

3. SITE AND PROJECT DESCRIPTION

The project site is located along the west side of Hill Canyon Road, just north of the Hill Canyon Treatment Plant in Camarillo (Figures 1 and 2). Vegetation in the project area predominantly consists of annual grass, brush and scattered trees. Both seismic lines are located along the east side of a running creek. Based on our discussions with you, it is our understanding that a bridge will be built over the creek bed at this location. Figures 2 and 3 depict the general site conditions.

4. SURVEY METHODOLOGY

A seismic P-wave (compression wave) refraction survey was conducted at the site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the areas surveyed. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface vertical component geophones and recorded with a 24-channel Geometrics StrataView

seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Two seismic lines (SL-1 and SL-2) were conducted at the project site. The general locations of the lines were selected by your office. Five shot points were conducted along SL-1 and three shot points were conducted along SL-2. The shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and for SL-1 at intermediate points between the ends and the midpoint.

The refraction method requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones or intrusions can also result in the misinterpretation of the subsurface conditions.

5. RESULTS AND CONCLUSIONS

As previously indicated, two seismic traverses were conducted as part of our study. The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using both SIPwin and SeisOpt Pro (Optim, 2008). Both programs use first arrival picks and elevation data to produce subsurface velocity models. SIPwin uses layer-based modeling techniques to produce a layered velocity model, where changes in velocities are depicted as discrete contacts. SeisOpt Pro uses a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

Table 2 lists the approximate P-wave velocities and depths calculated from the seismic refraction traverse using the layered modeling method. The approximate locations of the seismic refraction traverses are shown on the Seismic Line Location Map (Figure 2). The velocity models are in-

cluded in Figures 4a and 4b. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the traverse.

Table 1 – Seismic Traverse Results[1]

Traverse No. And Length	P-wave Velocity feet/second	Approximate Depth to Bottom of Layer in feet	Geology
SL-1 160 feet	V1 = 1,180 V2 = 4,850	12 – 14 ---	Alluvium Bedrock
SL-2 110 feet	V1 = 1,265 V2 = 5,040	13 – 17 ---	Alluvium Bedrock

1 Results based on the model generated using SIPwin, 2003

The results revealed the presence of two distinct layers. Based on our site observations and discussions with you, the layers detected have been interpreted to be alluvium overlying crystalline rock with varying degrees of decomposition/weathering.

6. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics, Inc. should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings and conclusions of this report by parties other than the client is undertaken at said parties' sole risk.

7. SELECTED REFERENCES

Caterpillar, Inc., 2004, Caterpillar Performance Handbook, Edition 35, Caterpillar, Inc., Peoria, Illinois.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Optim, Inc., 2008, SeisOpt Pro, V-5.0.

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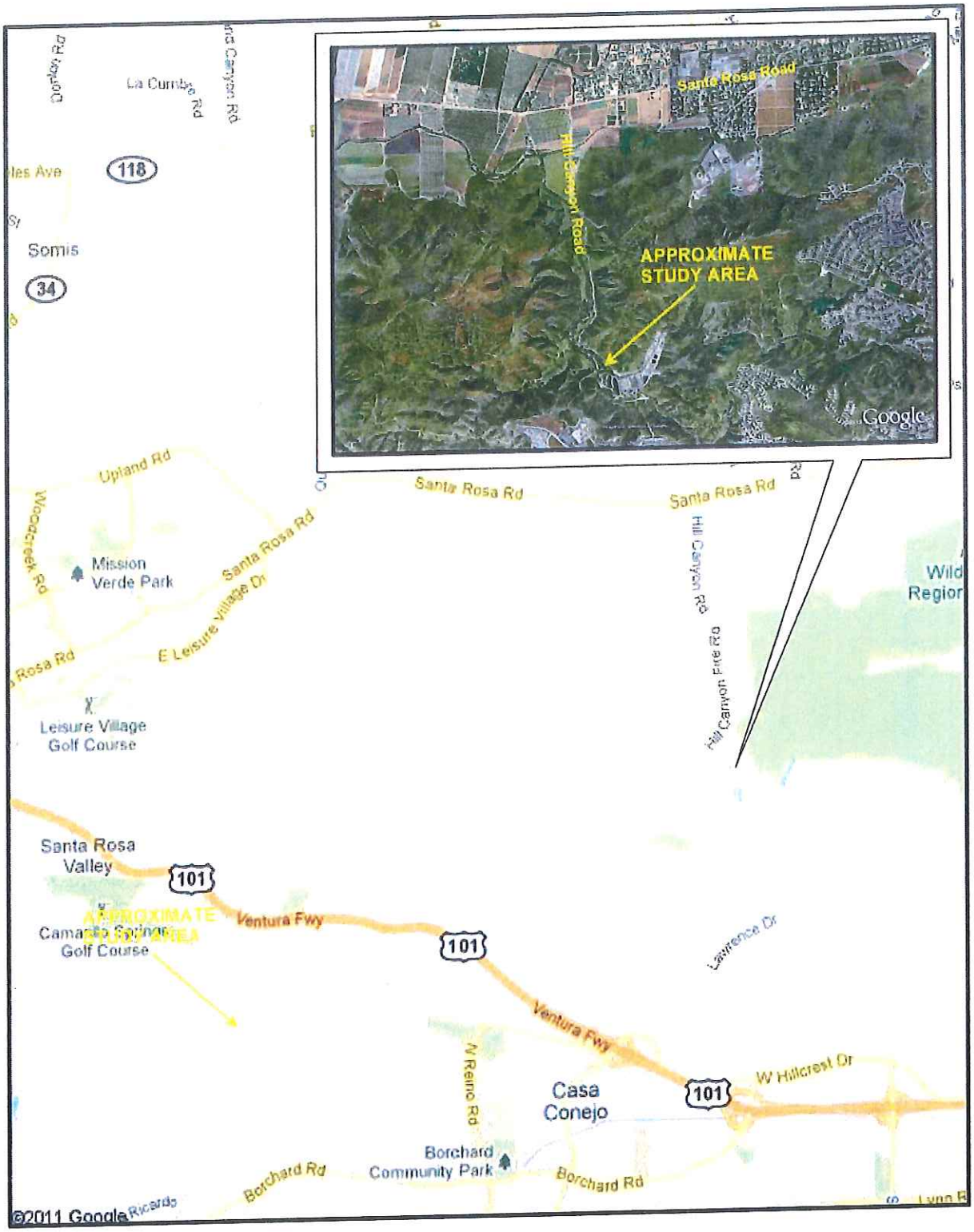
Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Press.



SITE LOCATION MAP

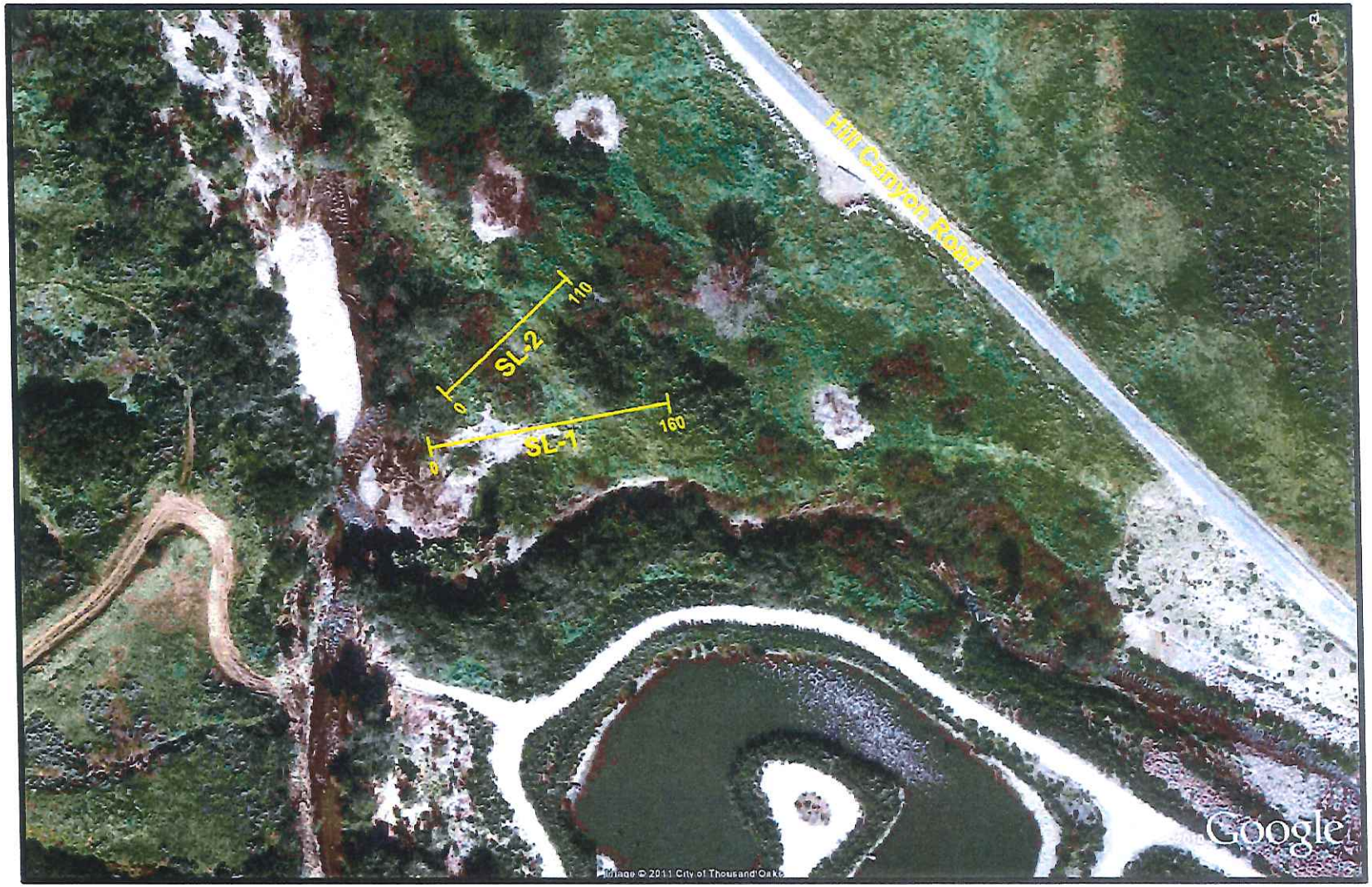
N

Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 1111

SOUTHWEST GEOPHYSICS INC.

Figure 1



SEISMIC LINE LOCATION MAP

N

Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

SOUTHWEST GEOPHYSICS INC.

Figure 2

0 100 200

approximate scale in feet

SITE PHOTOGRAPHS

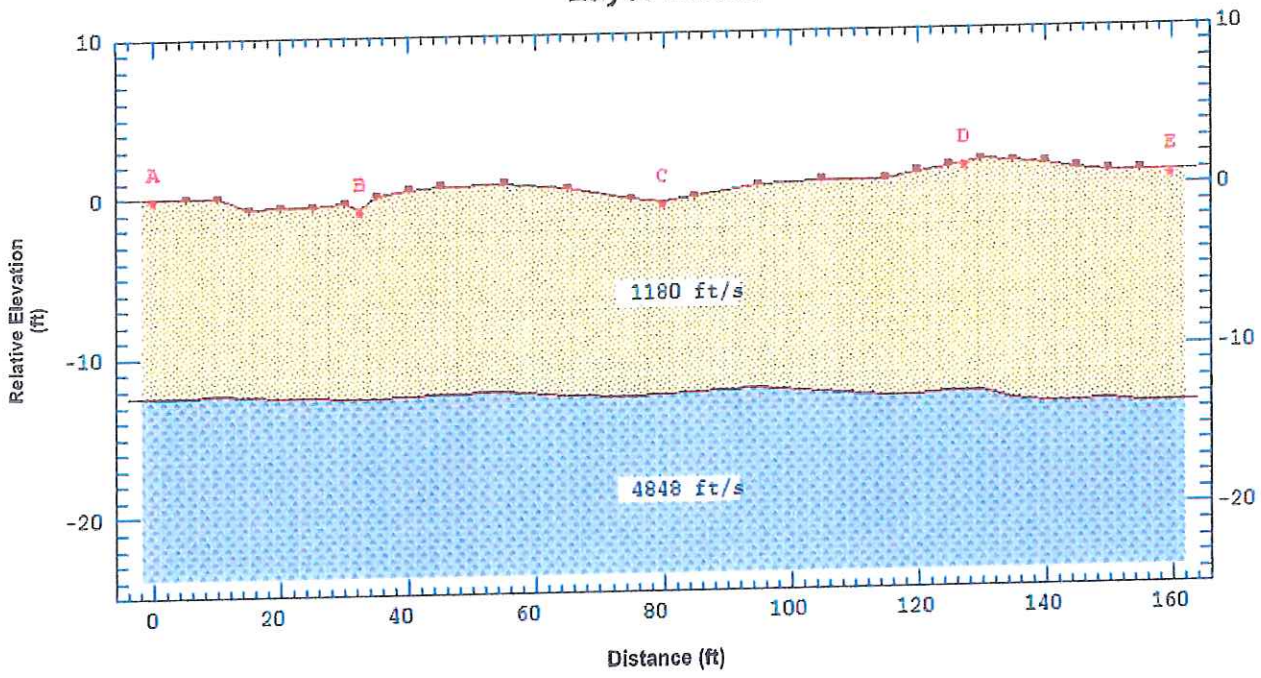
Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

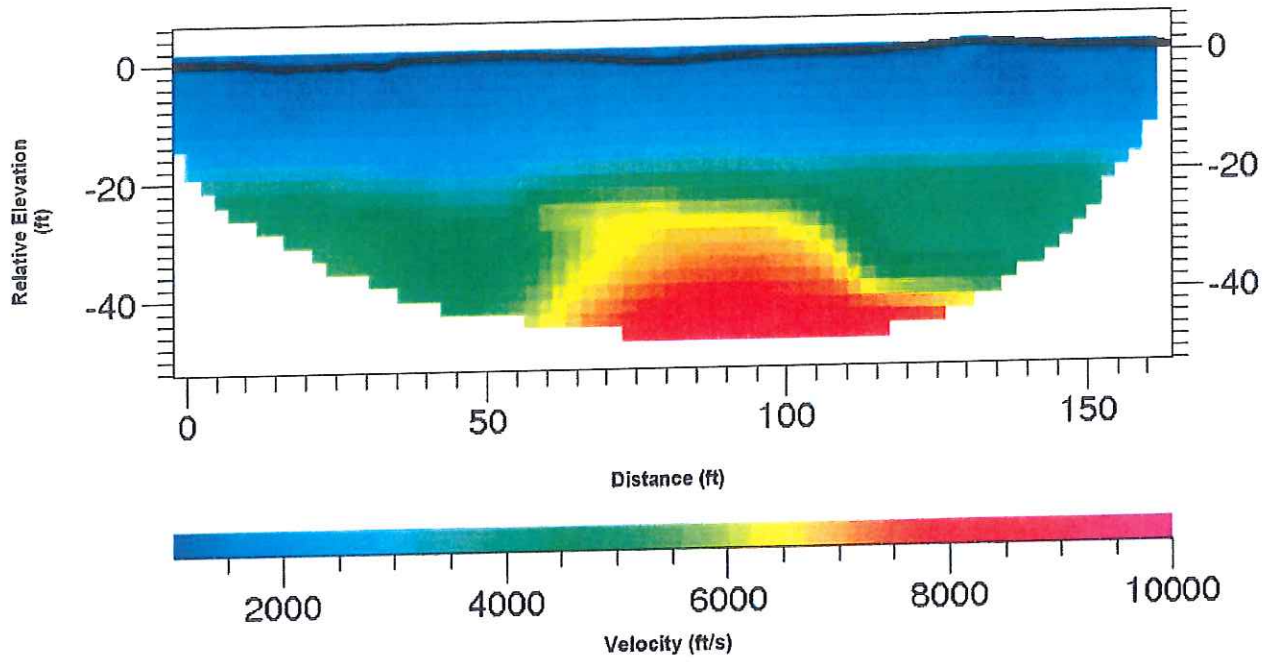
SOUTHWEST GEOPHYSICS INC

Figure 3

Layer Model



Tomography Model



SEISMIC PROFILE SL-1

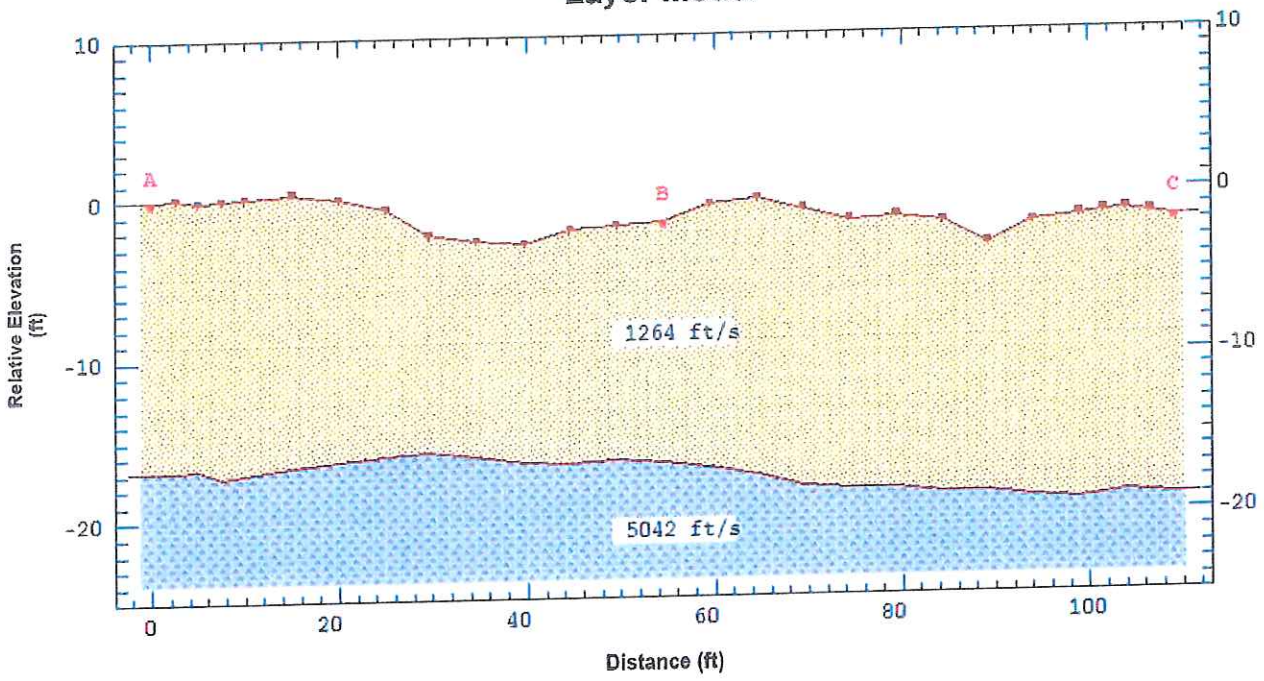
Hill Canyon Treatment Plant
Camarillo, California

Project No.: 111360 | Date: 11/11

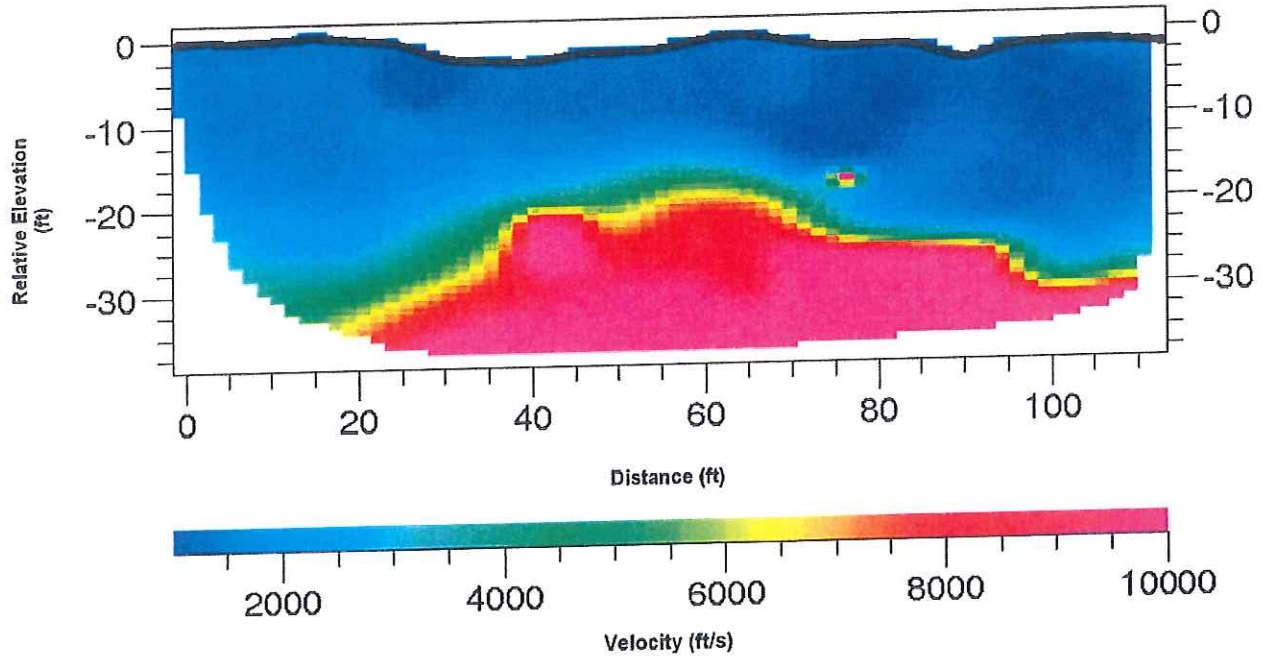
SOUTHWEST GEOPHYSICS INC

Figure 4a

Layer Model



Tomography Model



SEISMIC PROFILE SL-2	Hill Canyon Treatment Plant Camarillo, California	SOUTHWEST GEOPHYSICS INC Figure 4b
	Project No.: 111360 | Date: 11/11	

Appendix D

Slope Stability

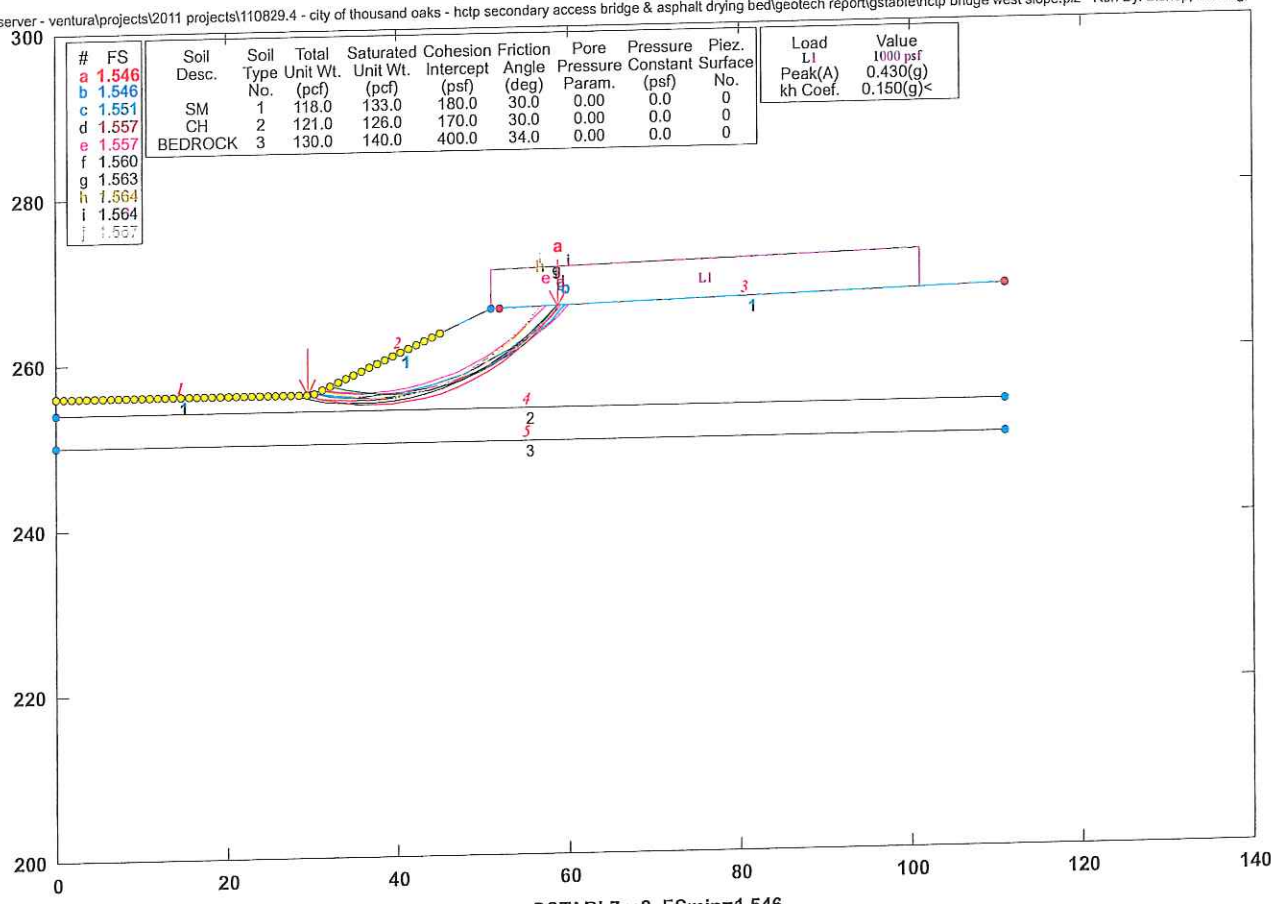
HCTP Secondary Access Bridge East Slope Camarillo, California

t:\satellite offices\server - ventura\projects\2011 projects\110829.4 - city of thousand oaks - hctp secondary access bridge & asphalt drying bed\geotech report\gstable\hctp bridge west slope.pl2 Run By: Bishop, Twining, Inc. 1/24/2012 1

#	FS
a	1.546
b	1.546
c	1.551
d	1.557
e	1.557
f	1.560
g	1.563
h	1.564
i	1.564
j	1.567

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
SM	1	118.0	133.0	180.0	30.0	0.00	0.0	0
CH	2	121.0	126.0	170.0	30.0	0.00	0.0	0
BEDROCK	3	130.0	140.0	400.0	34.0	0.00	0.0	0

Load	Value
LI	1000 psf
Peak(A)	0.430(g)
kh Coef.	0.150(g)<



GSTABL7 v.2 FSmin=1.546

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

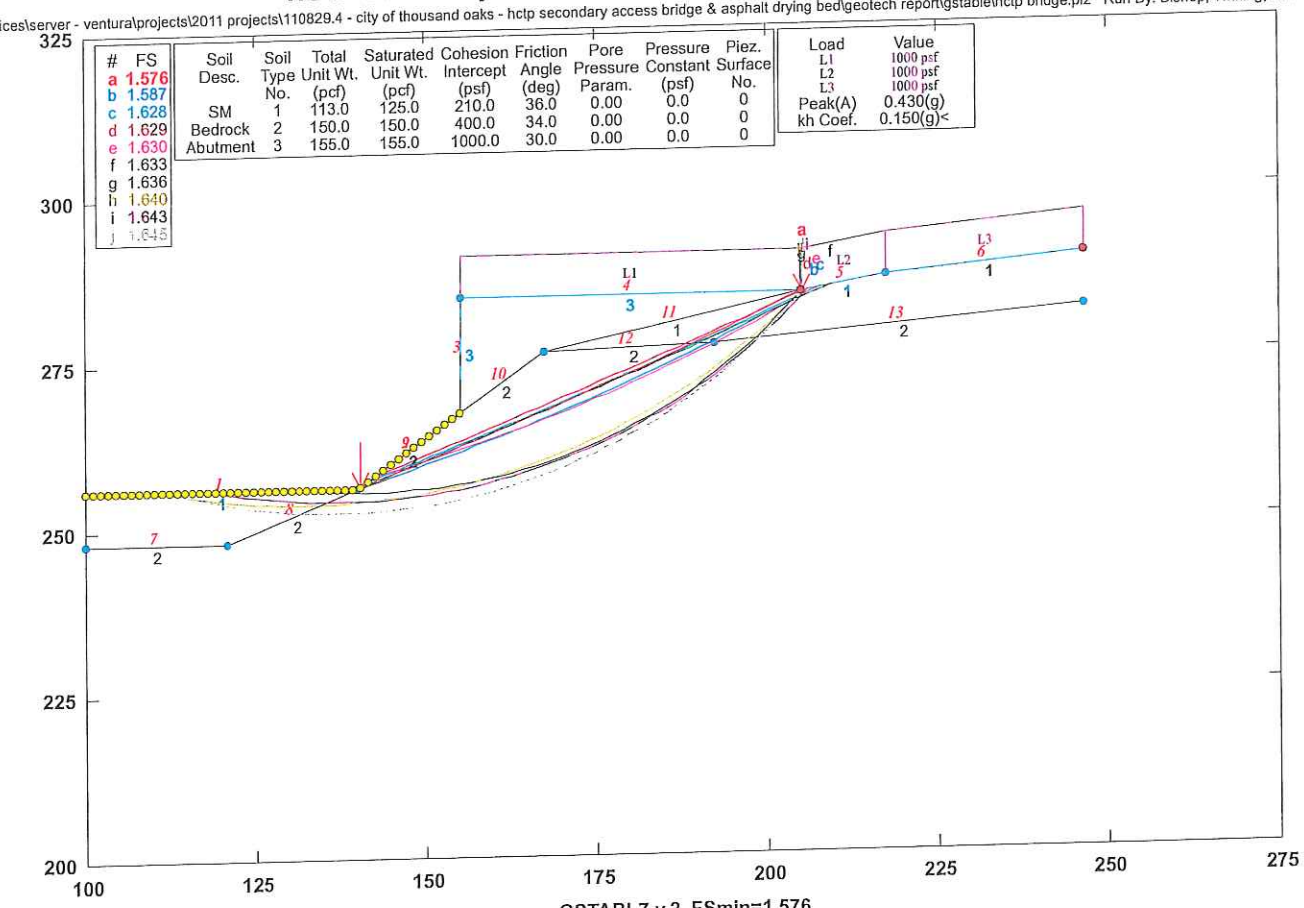
HCTP Secondary Access Bridge West Slope Camarillo, California

t:\satellite offices\server - ventura\projects\2011 projects\110829.4 - city of thousand oaks - hctp secondary access bridge & asphalt drying bed\geotech report\gstable\hctp bridge.pl2 Run By: Bishop, Twining, Inc. 1/24/2012 11

#	FS
a	1.576
b	1.587
c	1.628
d	1.629
e	1.630
f	1.633
g	1.636
h	1.640
i	1.643
j	1.645

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
SM	1	113.0	125.0	210.0	36.0	0.00	0.0	0
Bedrock	2	150.0	150.0	400.0	34.0	0.00	0.0	0
Abutment	3	155.0	155.0	1000.0	30.0	0.00	0.0	0

Load	Value
L1	1000 psf
L2	1000 psf
L3	1000 psf
Peak(A)	0.430(g)
kh Coef.	0.150(g)<



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Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Appendix E

Lateral Pier Capacity

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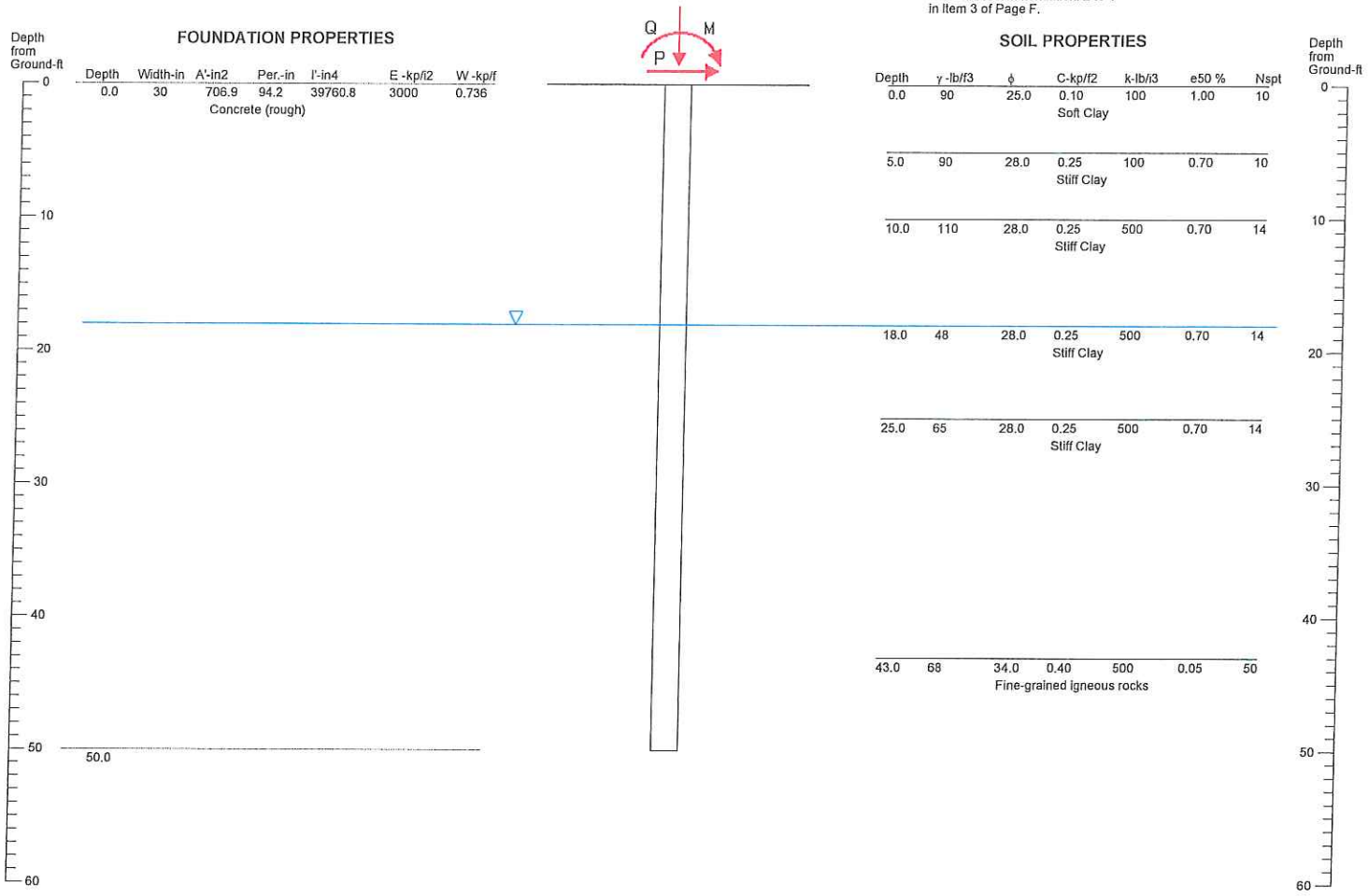
FOUNDATION PROFILE & SOIL CONDITIONS

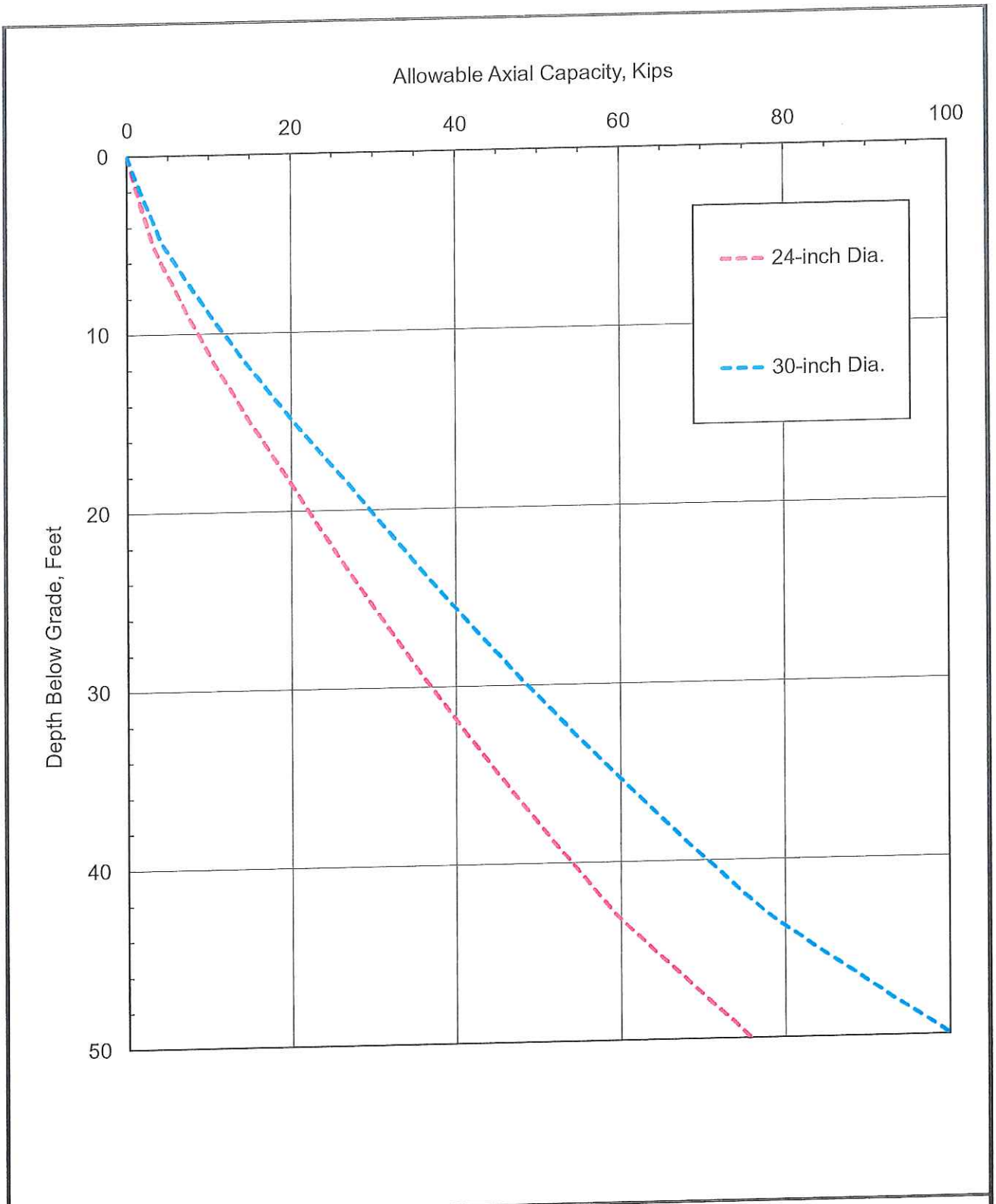
Diameter more than 24in (61cm).
For bell section, select "Belled" in Diameter Variation of Pile Section Screen. Recommendation: 2 to 4 in Item 3 of Page F.



Batter Angle=0 (Pile diameter not to scale) Surface Angle=0

Hill Canyon Bridge Project
Camarillo, California

Figure 1



TWINING

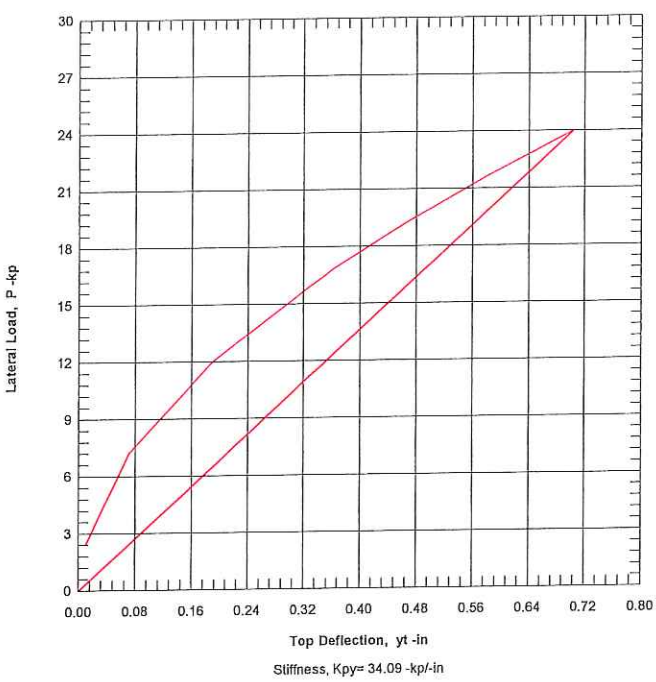
UPLIFT PILE CAPACITY

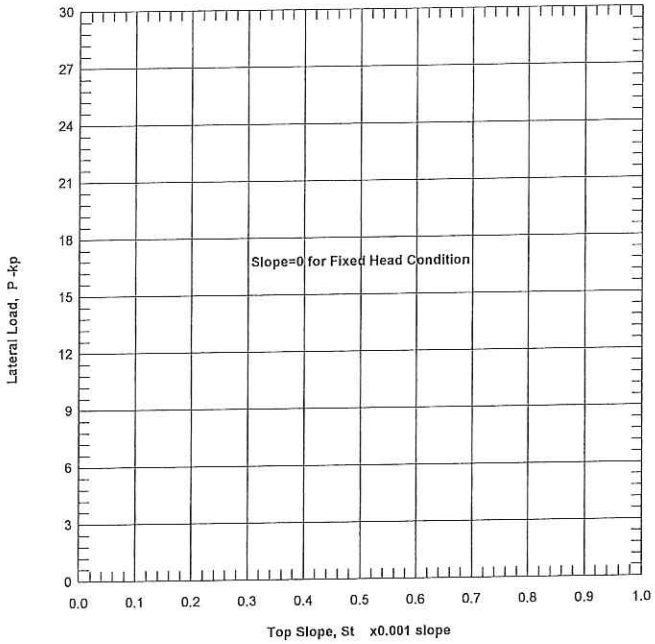
Hill Canyon Bridge
9600 Santa Rosa Road
Camarillo, California

PROJECT NO.	DATE	FIGURE 2
181040.4	January 2019	

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Fixed, Kbc=2



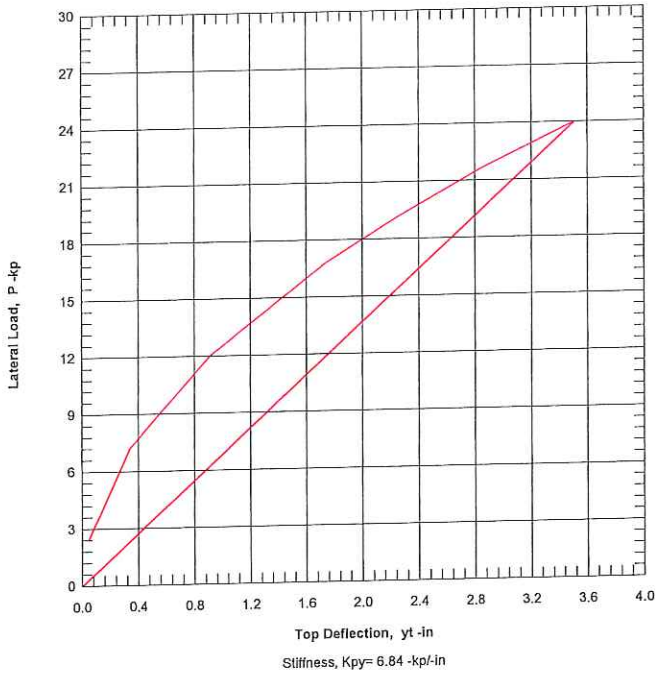


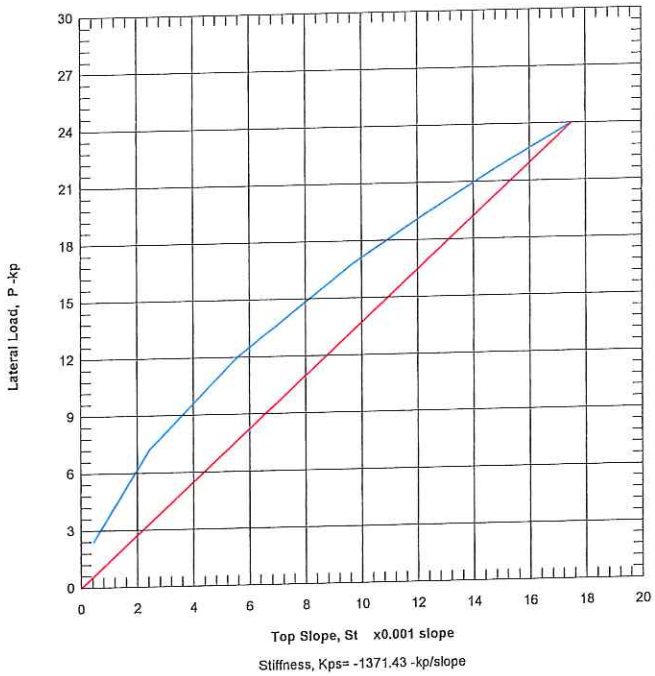
Hill Canyon Bridge Project
Camarillo, California

Figure 2

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Free, Kbc=1





Hill Canyon Bridge Project
Camarillo, California

Figure 2

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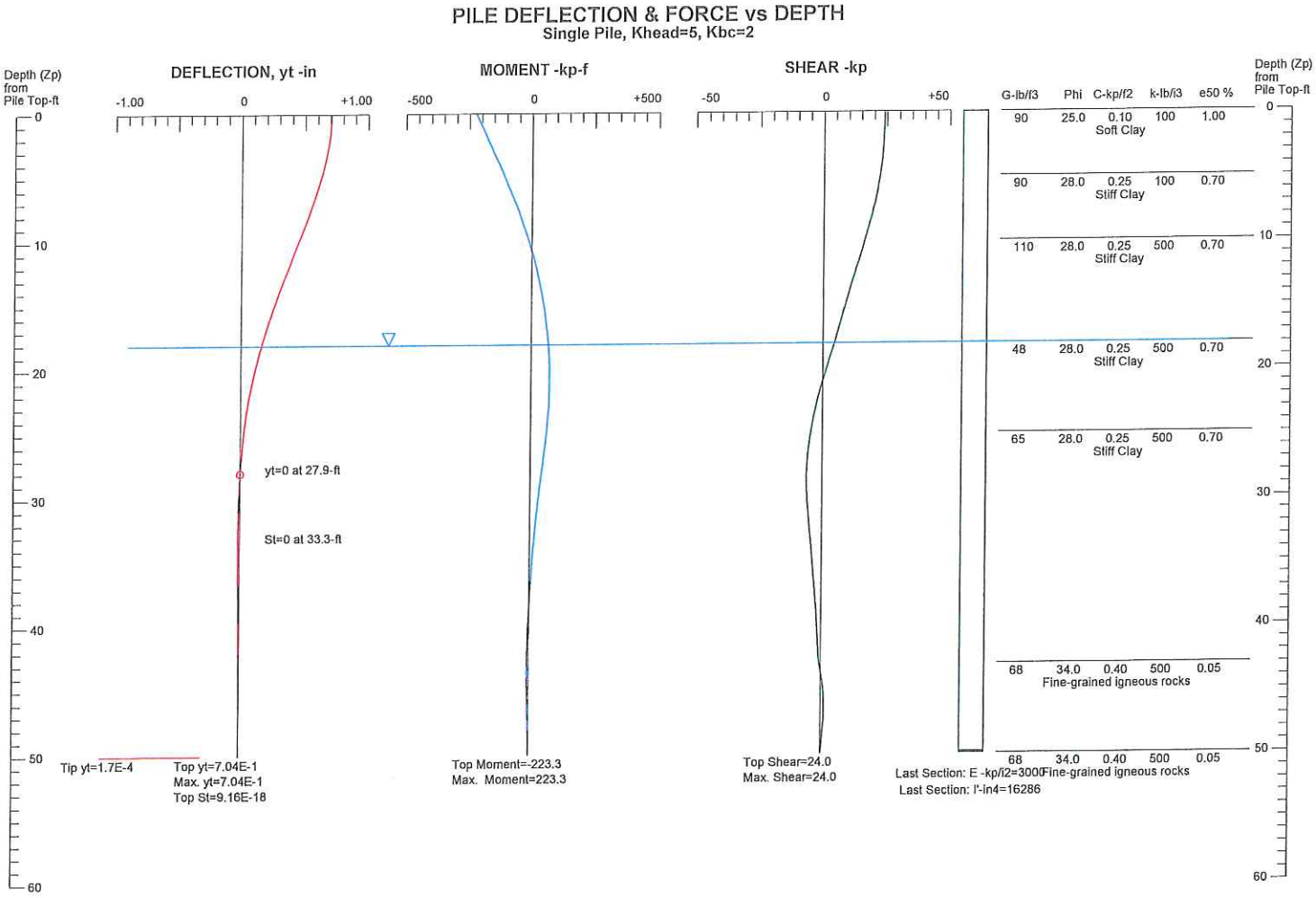

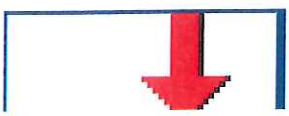

Hill Canyon Bridge Project
Camarillo, California

Figure 2

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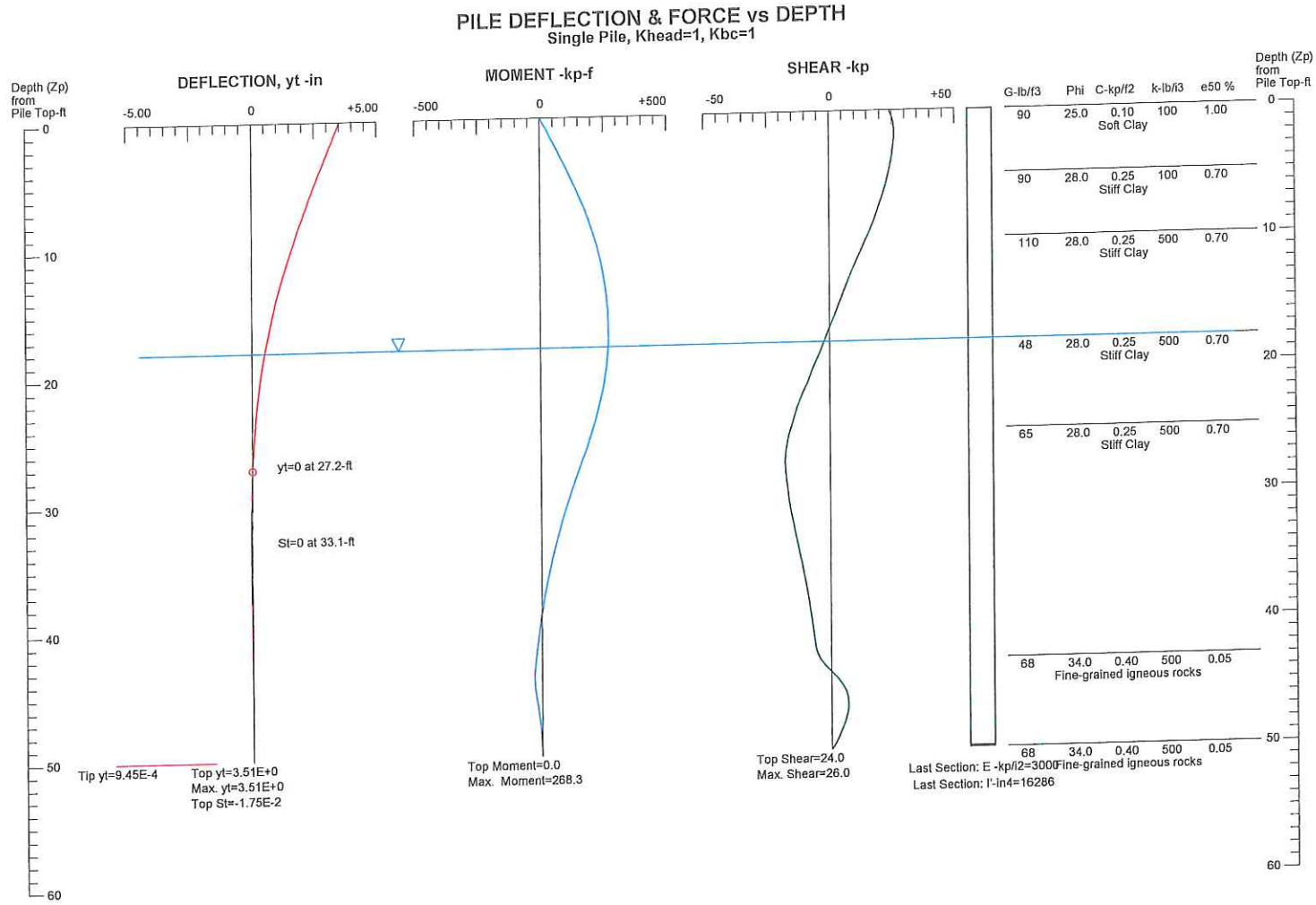
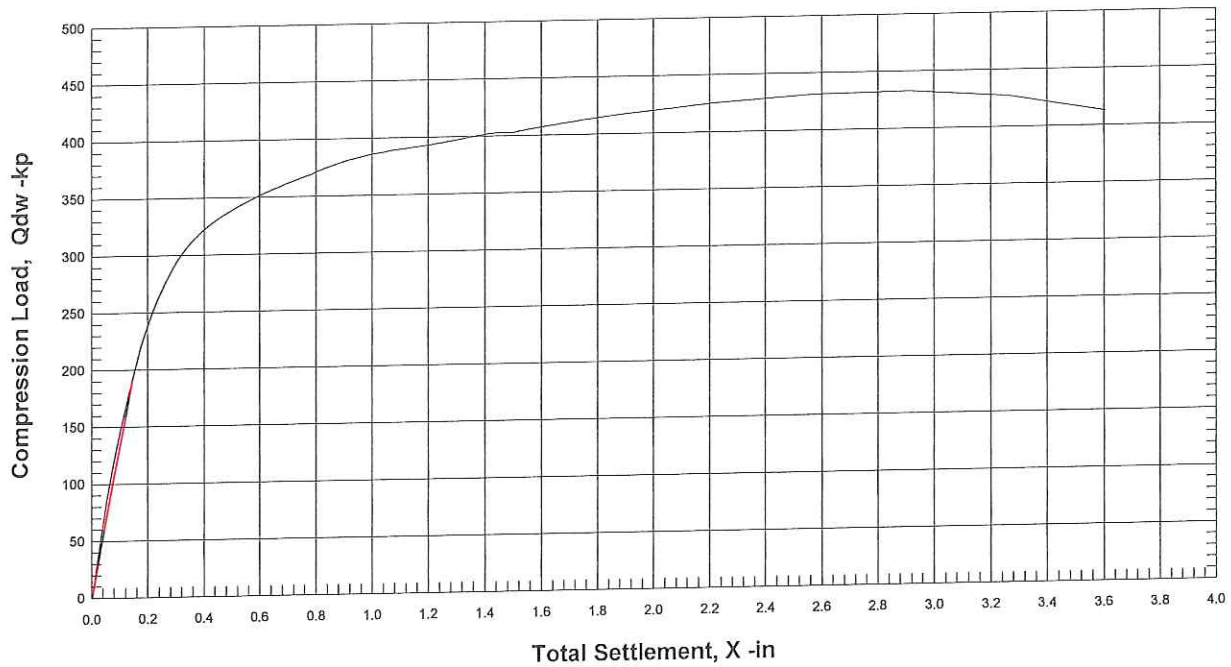


Hill Canyon Bridge Project
Camarillo, California

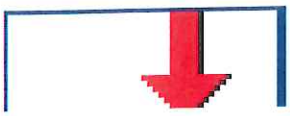
Figure 2

Vertical Load vs. Total Settlement



Total _____

Stiffness, Kqx= 1332.67 -kp/-in

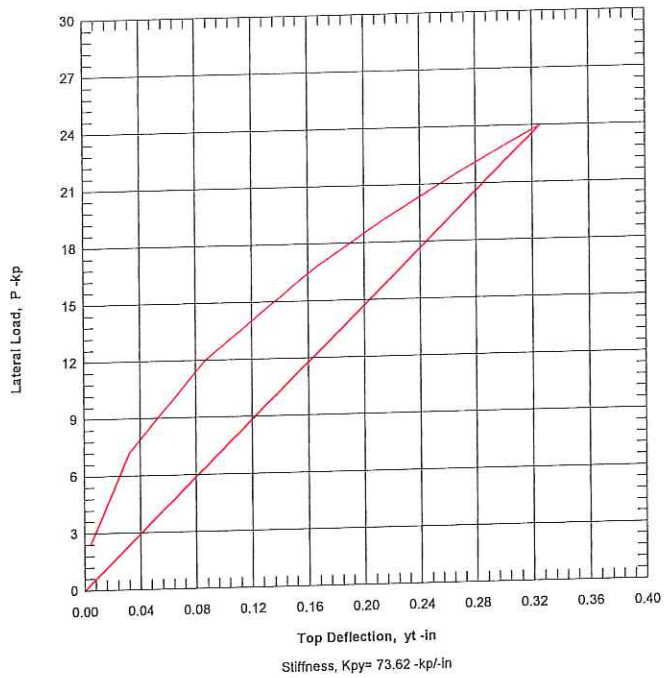


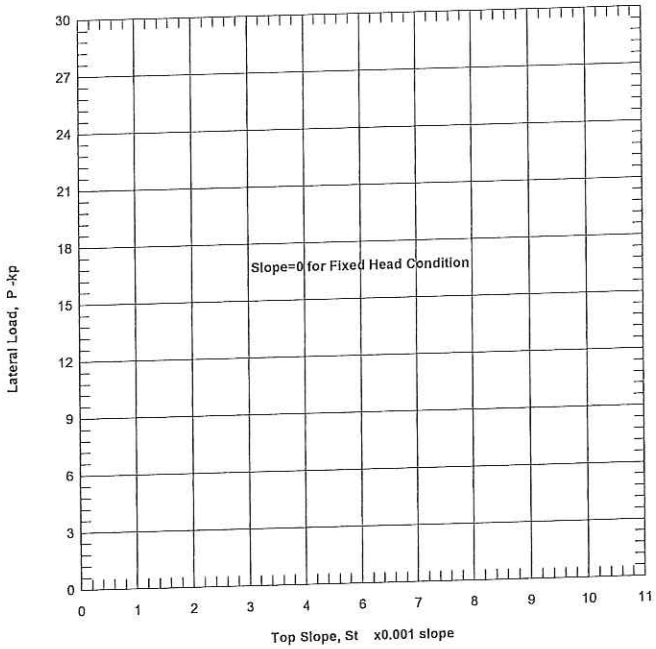
Hill Canyon Bridge Project
Camarillo, California

Figure 1

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Fixed, Kbc=2



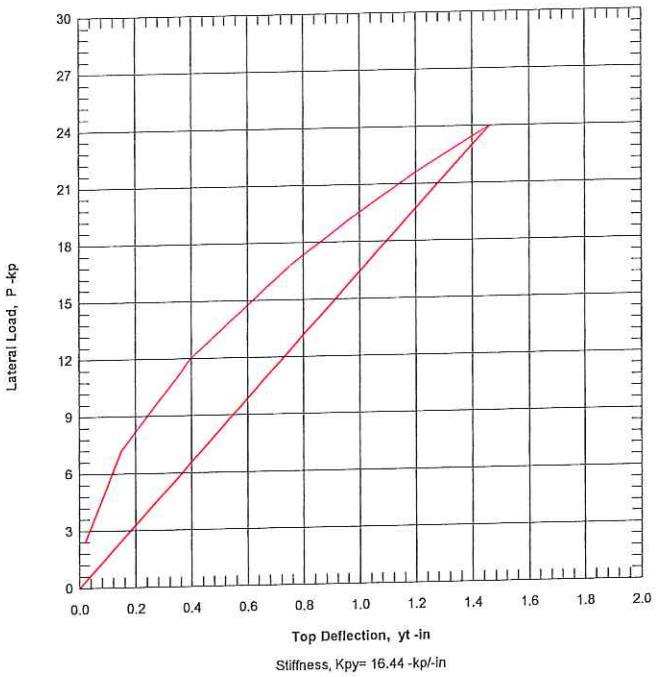


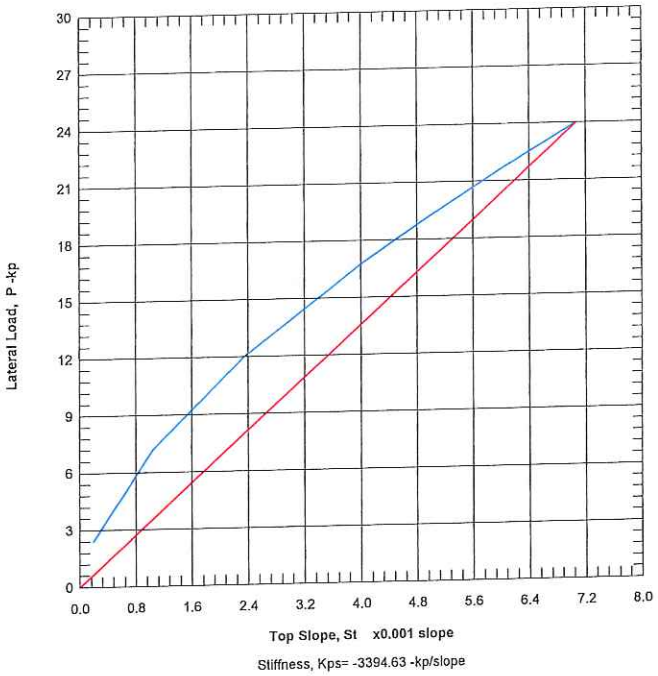
Hill Canyon Bridge Project
Camarillo, California

Figure 2

LATERAL LOAD vs DEFLECTION & SLOPE

Single Pile, Free, Kbc=1





Hill Canyon Bridge Project
Camarillo, California

Figure 2

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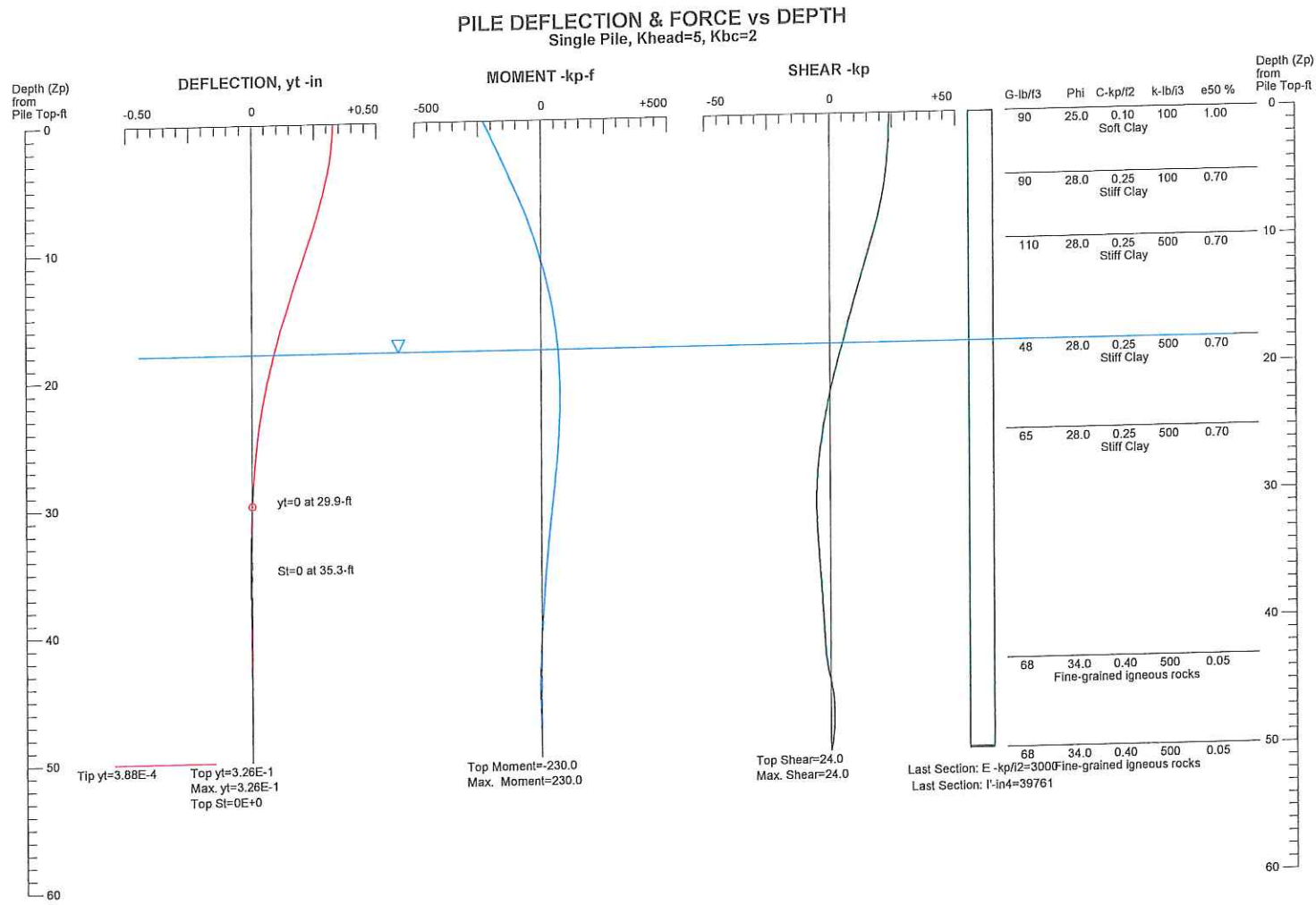

Hill Canyon Bridge Project
Camarillo, California

Figure 2

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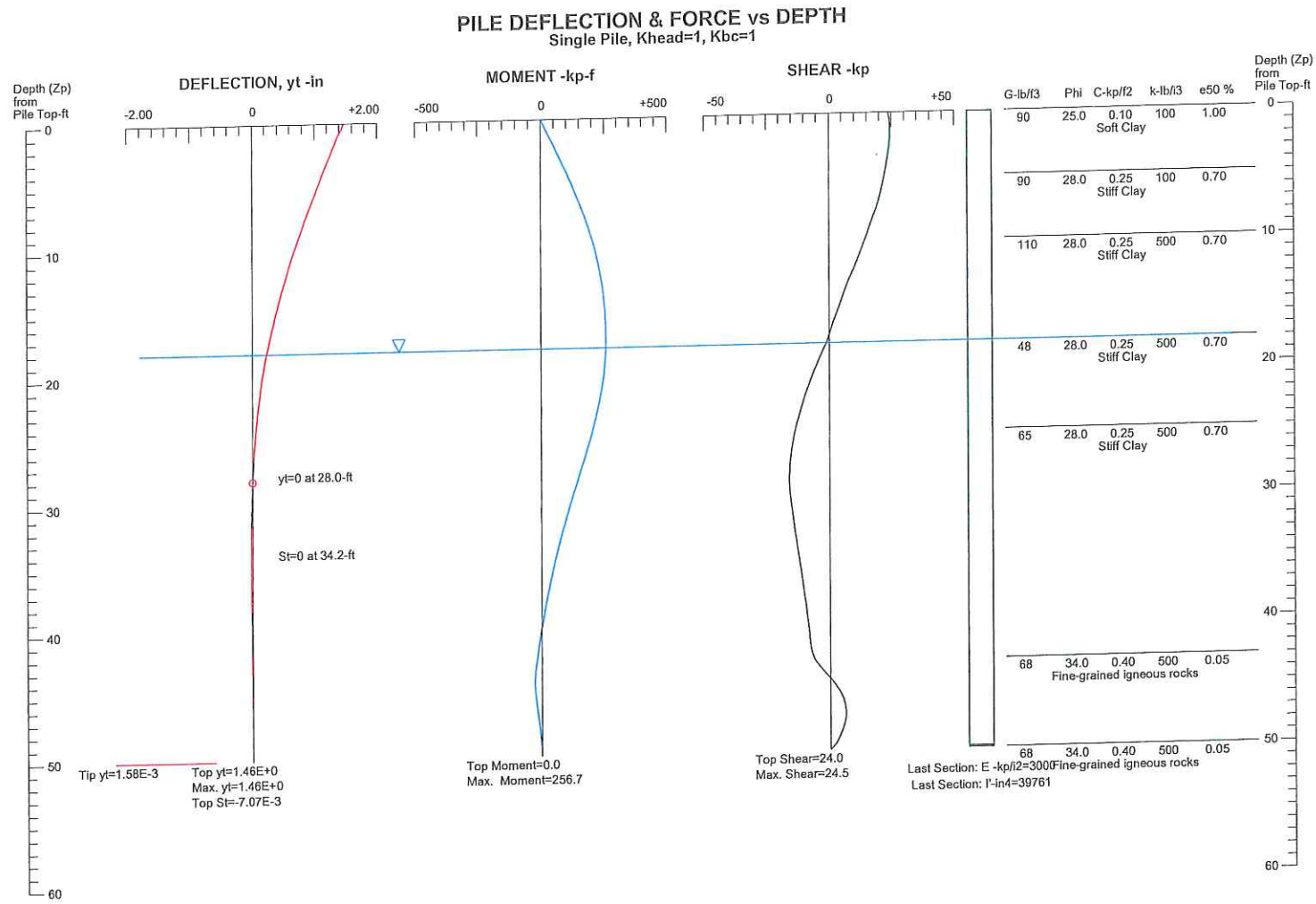
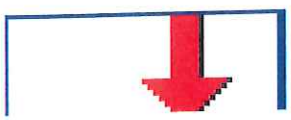
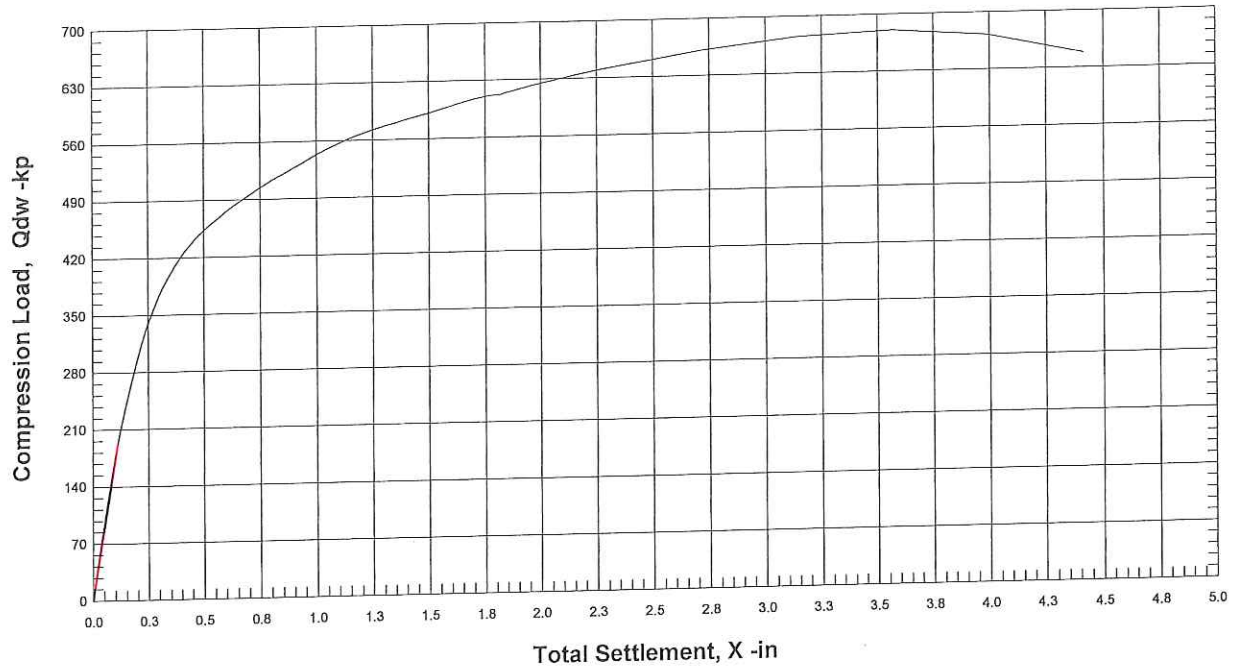




Hill Canyon Bridge Project
Camarillo, California

Figure 2

Vertical Load vs. Total Settlement



Total _____

Stiffness, Kqx= 1730.43 -kp/-in

Hill Canyon Bridge Project
Camarillo, California

Figure 1

Appendix F

Seismic Design Parameters
AASHTO and ASCE 7-10

Design Maps Detailed Report

ASCE 7-10 Standard (34.212°N, 118.927°W)

Site Class B – "Rock", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 1.819 g
From Figure 22-2 [2]	S_1 = 0.668 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class B, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = B and S_S = 1.819 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = B and S_1 = 0.668 g, F_v = 1.000

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.819 = 1.819$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.000 \times 0.668 = 0.668$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

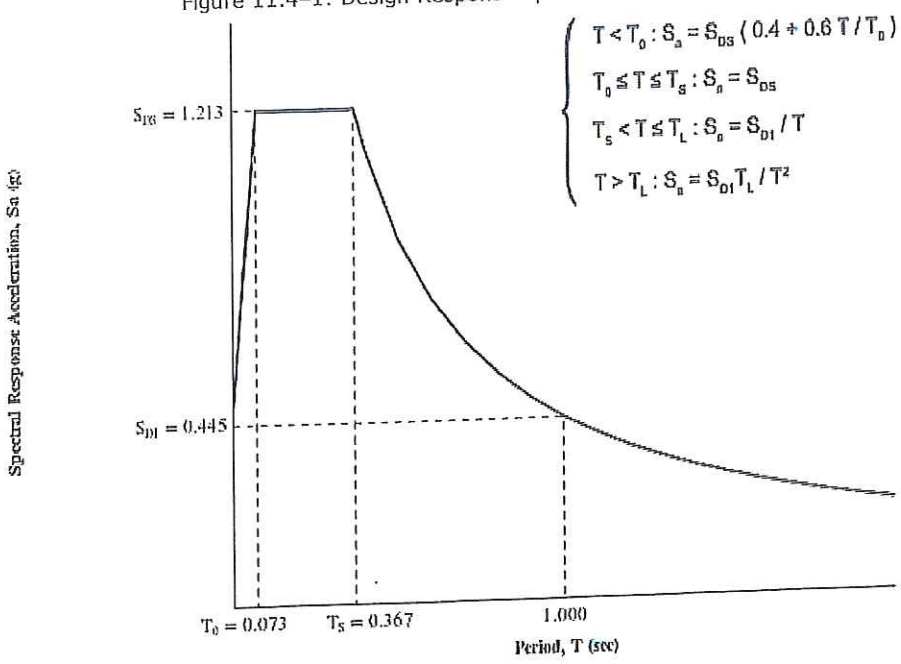
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.819 = 1.213$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.668 = 0.445$ g

Section 11.4.5 — Design Response Spectrum

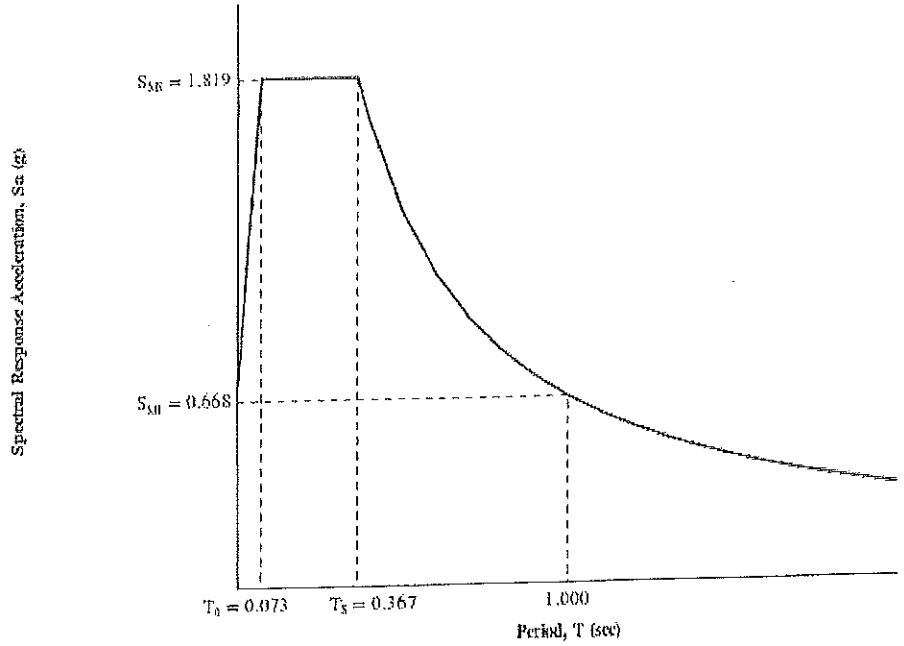
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.694

Equation (11.8-1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.694 = 0.694$ g

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = B and PGA = 0.694 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.001

From Figure 22-18 [6] C_{R1} = 1.006

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.213 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.445 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*:
   https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

USGS Design Maps Summary Report

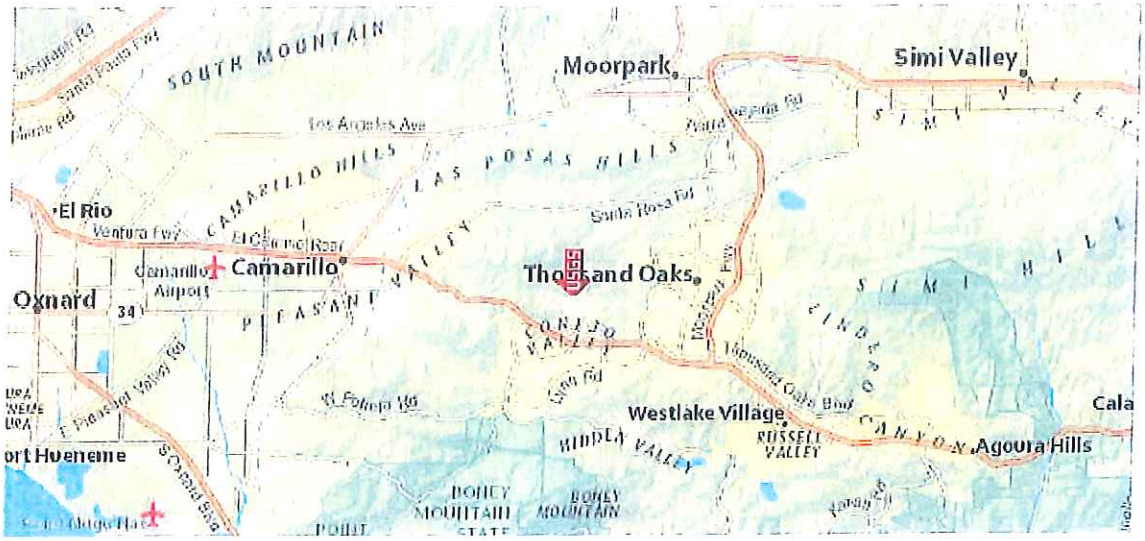
User-Specified Input

Report Title Hill Canyon Treatment Plant Bridge
Tue December 4, 2018 15:34:29 UTC

Building Code Reference Document 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design
(which utilizes USGS hazard data available in 2002)

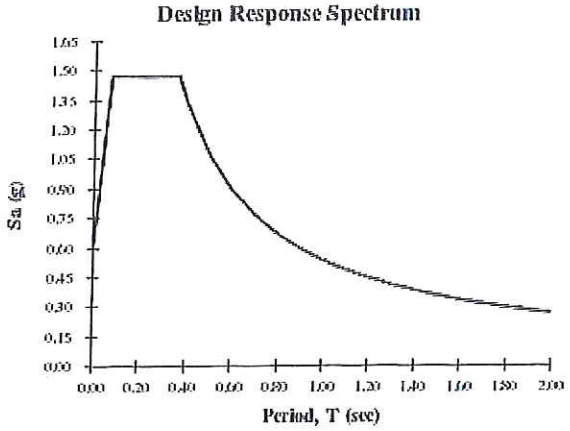
Site Coordinates 34.212°N, 118.927°W

Site Soil Classification Site Class B – "Rock"



USGS-Provided Output

PGA =	0.606 g	**A_s =**	0.606 g
S_s =	1.473 g	**S_{DS} =**	1.473 g
S_1 =	0.536 g	**S_{D1} =**	0.536 g



Appendix B

Biological Resources Assessment

Conejo Canyons Bridge at Hill Canyon Treatment Plant

Biological Resources Assessment

prepared by

City of Thousand Oaks
Community Development Department
2100 Thousand Oaks Boulevard
Thousand Oaks, California 91362
Contact: Jessica Magaña, Associate Planner

prepared with the assistance of

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

September 2021

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

Table of Contents

Tables

Figures

Appendices

Executive Summary

This Biological Resources Assessment (BRA) documents the existing conditions of the proposed Conejo Canyons Bridge at Hill Canyon Treatment Plant project site and evaluates the potential for sensitive biological resources to be affected, such as, but not limited to, special status species, sensitive communities, protected trees, and potential wetlands or jurisdictional water features. The information provided in this report was derived from previous reports regarding this project, a literature review, and field surveys conducted by Rincon Consultants, Inc. (Rincon) biologists.

The survey area addressed in this report consists of the project site and a 500-foot buffer; it consists of disturbed and natural areas and includes a portion of Arroyo Conejo Creek west of Hill Canyon Road in the city of Thousand Oaks, Ventura County, California. The area was partially burned in the November 2018 Hill Fire, and a recent field survey documented the post-fire conditions on the project site and surrounding area. Based on the post-fire assessment, it was verified that the vegetation present on the site includes native and non-native riparian and upland vegetation, and ornamental trees. The only special status plant observed during the field surveys was California walnut (*Juglans californica*). Four special status plant species and 12 special status animal species were identified as having potential to occur within the project site based on suitable habitat conditions, none of which were directly observed by Rincon during site surveys; however, two sensitive plant communities (i.e., ashy buckwheat scrub and California walnut groves) were observed during field surveys. Two special-status animal species are considered present due to field observations in 2018: Cooper's hawk (*Accipiter cooperii*) and yellow warbler (*Setophaga petechia*). In addition, a woodrat midden was observed and is assumed to be a sign of the San Diego desert woodrat (*Neotoma lepida intermedia*). Two jurisdictional features were observed and mapped and consist of the Arroyo Conejo and North Fork Arroyo Conejo, perennial drainages with a confluence adjacent to the project site boundaries. Both drainages are considered redline streams by the Ventura County Watershed Protection District. The jurisdictional delineation survey (the project site and a 100-foot buffer) observed 2.47 acres of California Department of Fish and Wildlife (CDFW) jurisdictional streambed, 0.07 acre of United States Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) jurisdictional wetland waters of the U.S./State, and 0.26 acre of USACE and RWQCB jurisdictional non-wetland waters of the U.S./State.

The survey area contains several coast live oaks (*Quercus agrifolia*), California walnut, ornamental southern live oak (*Quercus virginiana*) and other trees protected by the City of Thousand Oaks. These trees, as well as other vegetation located on and adjacent to the project site, provide suitable habitat for nesting birds. With the use of best management practices and appropriate impact avoidance, minimization and mitigation measures, impacts to these resources can be avoided or reduced to a less than significant level. There are no other sensitive biological resources on or adjacent to the project site.

1 Introduction

1.1 Project Location

The 0.61-acre project site is located in the city of Thousand Oaks, on the west side of Hill Canyon Road, approximately 1.75 miles south of the intersection of Santa Rosa Road and Hill Canyon Road, and approximately 330 feet northwest of the treatment ponds at the Hill Canyon Treatment Plant (Figure 1). The project site is located on approximately 0.61 acre of a larger 495-acre parcel on Assessor's Parcel Number 667-0-120-160. The new bridge would span over Arroyo Conejo Creek in Hill Canyon. Hill Canyon is a deeply incised canyon within the northern Newbury Park and Thousand Oaks portions of the Conejo Volcanics formation. The canyon separates the Conejo Grade area from Mount Clef Ridge. It was formed by Arroyo Conejo Creek flowing down through the upper Conejo Valley to the lower Santa Rosa Valley, where the creek merges with Arroyo Santa Rosa and becomes Conejo Creek. The only developed area in Hill Canyon is the Hill Canyon Wastewater Treatment Plant and the sparsely developed Santa Rosa Valley Park.

The project site is in Township 2 North, Range 20 West (San Bernardino Baseline and Meridian), and is depicted on the *Newbury Park* Geological Survey 7.5-minute quadrangle map (United States Geological Survey [USGS] 2018). It is bounded by the Hill Canyon Treatment Plant to the southeast and is otherwise surrounded by open space (Figure 2 and Figure 4).

1.2 Project Description

The Conejo Open Space Conservation Agency (COSCA), a joint powers authority consisting of the City of Thousand Oaks (City) and the Conejo Recreation and Park District, and the City's Public Works Department are proposing the Conejo Canyons Bridge Project (project), composed of a new bridge which would span Arroyo Conejo Creek in Hill Canyon, and an associated access road to connect the eastern side of the new bridge to the existing Hill Canyon Road.

The purpose of the new bridge is to provide access to existing open space areas for outdoor recreationists as well as City and COSCA staff vehicles. The bridge and new access road would provide several benefits to the City, COSCA, and the public. The bridge was identified in COSCA's Conejo Canyons Management Plan as a high priority open space amenity for improving public and emergency access (COSCA 2010). The bridge would connect existing trails on either side of the creek and would provide a key link in the trail system between the Conejo Canyons and Wildwood open space areas. It would provide trail users (e.g., hikers, mountain bikers, and equestrians) safe access between Wildwood Park and Conejo Canyons by allowing them to remain on the existing Hill Canyon trail and Arroyo Conejo trail rather than utilizing Hill Canyon Road, which was not designed to accommodate such trail users. Additionally, the bridge would provide COSCA Park Rangers better accessibility to open space areas in support of maintenance and resource management. It would also provide a direct route for City Public Works vehicles between the City's Municipal Services Center and Hill Canyon Treatment Plant.

Figure 1 Regional Location

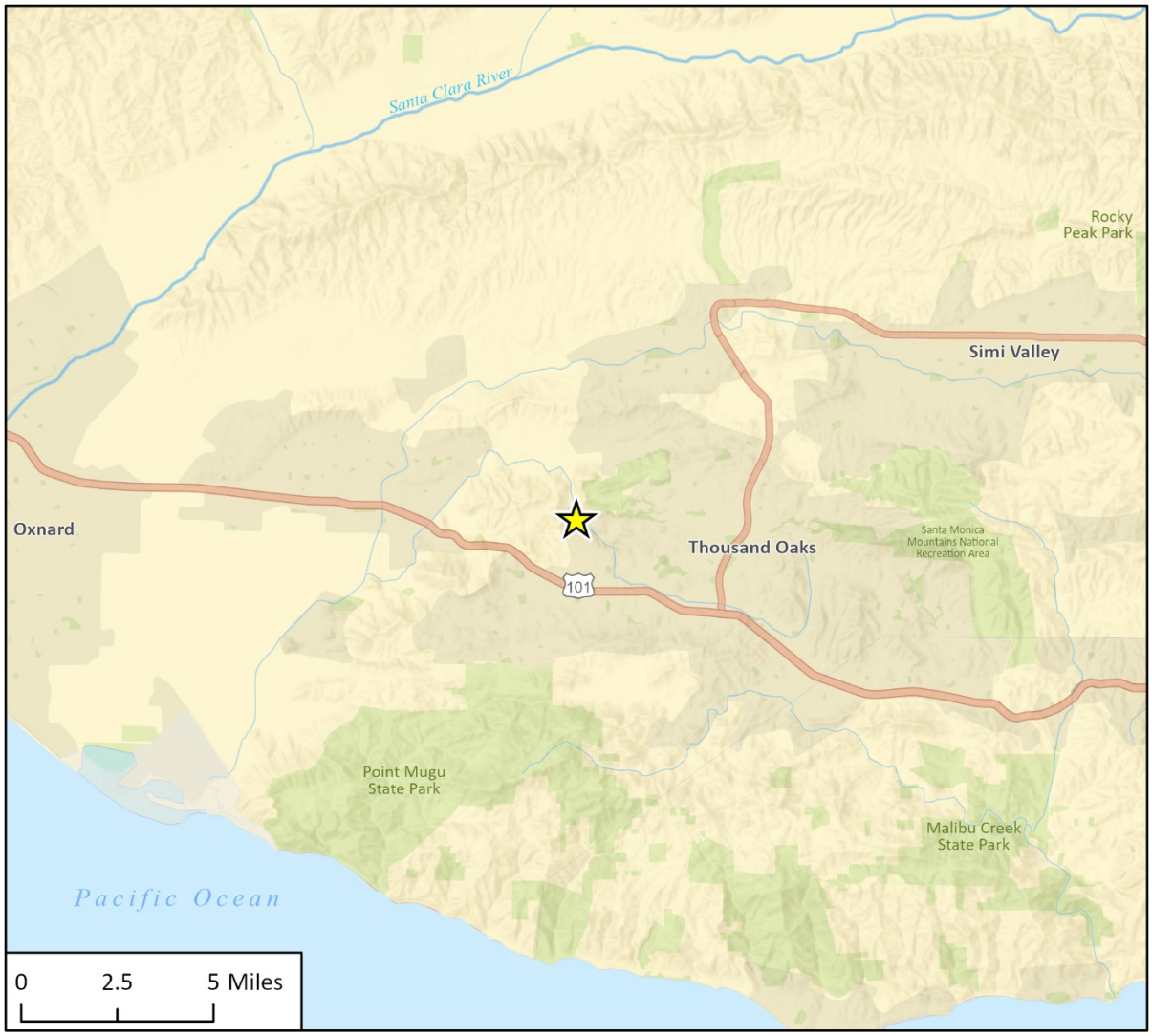
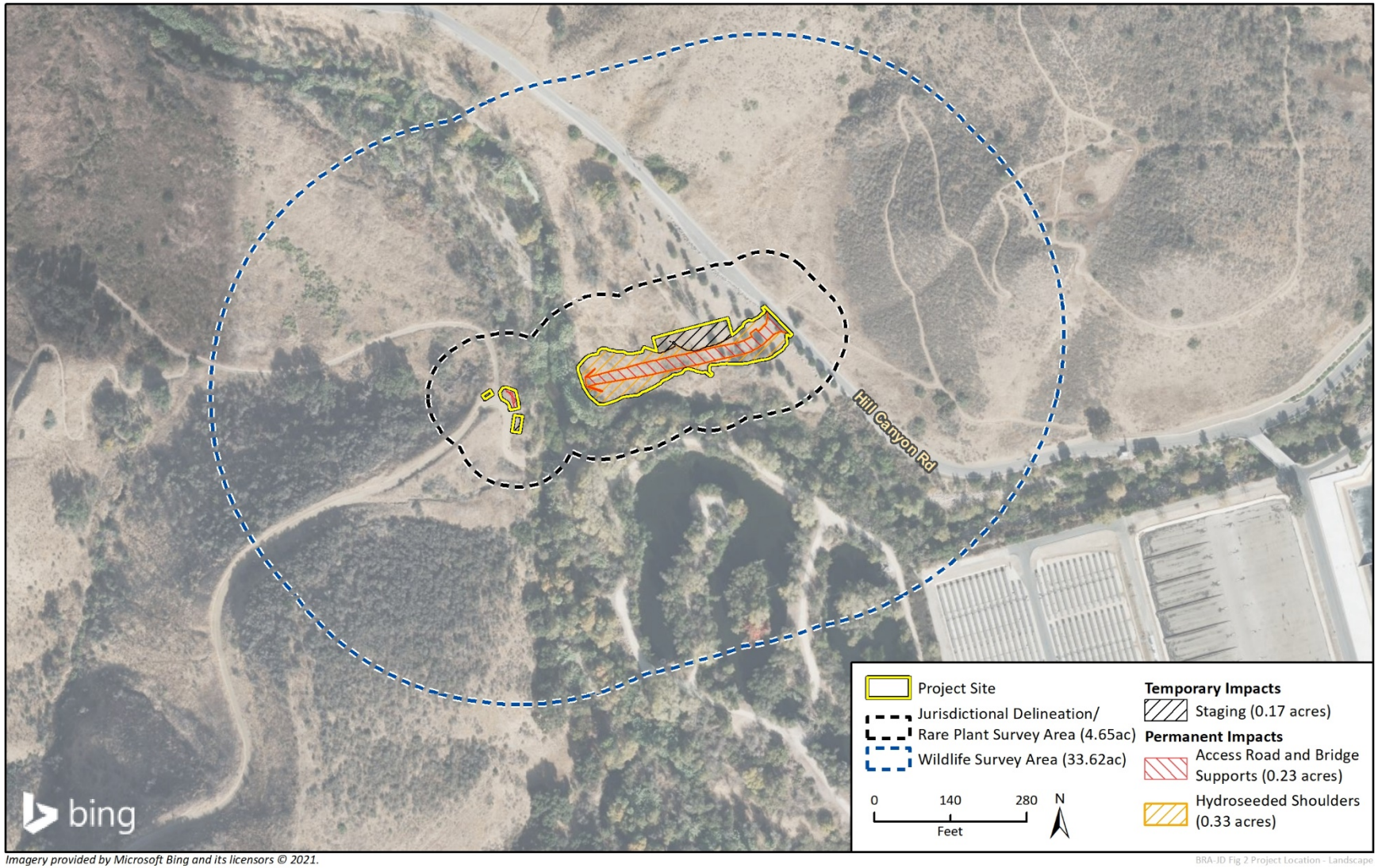


Figure 2 Project Location



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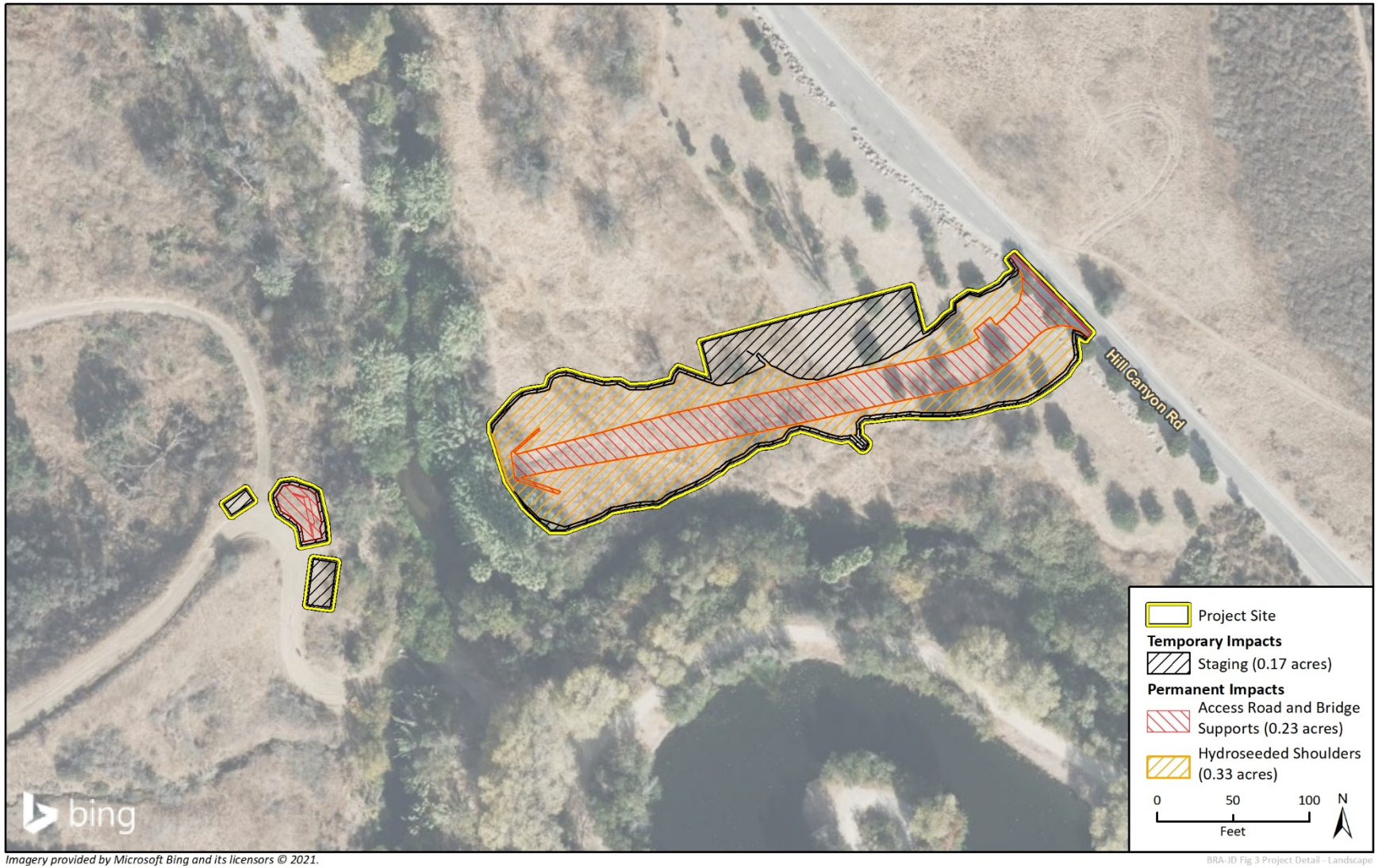
Additional data provided by City of Thousand Oaks, 2019.

BRA-JD Fig 2 Project Location - Landscape

Figure 3 Project Detail



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Additional data provided by City of Thousand Oaks, 2019.

BRA-JD Fig 3 Project Detail - Landscape

The bridge is proposed as a single-span design, meaning that it spans one section between two supports, anchored on either end with no supports in the middle. The bridge would be secured to concrete abutments on either side of the creek. The western end of the bridge would be positioned to tie into the existing Hill Canyon Fire Road, which descends into the canyon from the north end of Rancho Conejo Boulevard, while the eastern end of the bridge would connect to Hill Canyon Road by a 375-foot-long section of new access road that would be installed as part of the project. The bridge would be manufactured off-site and installed using a crane to lower it into place. The bridge footings would consist of concrete abutments positioned at the top of the stream banks to avoid intrusion into the channel. The eastern abutments would utilize 24-inch cast-in-drilled-hole piles, while the western abutments would be anchored into bedrock.

The proposed bridge would be approximately 140 feet long. An access road that would connect the bridge to Hill Canyon Road would be approximately 375 feet long. It would be 20 feet wide at Hill Canyon Road, and taper to 12 feet wide at the bridge connection. The road surface would consist of 4-inch-thick asphalt concrete, underlain with 10 inches of Class 2 aggregate base. The top approximately 36 inches of native soil would be removed and recompacted to accommodate the new road section, and approximately 3,000 cubic yards of imported fill would be applied. The bridge itself will be composed of pre-weathered steel with a concrete deck.

Existing access roads will be used during construction activities, including Rancho Conejo Boulevard and Hill Canyon Road. A culvert will be installed at approximately the midpoint of the new access road to accommodate an existing swale. The culvert will be an 18-inch high-density polyethylene corrugated pipe approximately 80 feet long with grouted riprap pads at either end. The riprap pads would be approximately five feet long by four feet wide, for a total volume of 40 cubic feet.

Water would not need to be extracted or diverted for this project. However, groundwater may be encountered when piles are constructed for the eastern abutment. In anticipation of this, the contractor would prepare and submit a dewatering plan for approval that covers how expelled water would be captured and/or contained and treated. If necessary, a location for a sump has been identified adjacent to the project site.

Construction is anticipated to commence in fall 2022 and take approximately 180 days. Equipment consistent with bridge construction and earth moving would be utilized for this project, such as loaders, dozers, drilling rigs, and cranes. No construction would occur in Conejo Creek and erosion control measures would be utilized to prevent soil from entering the stream.

2 Methodology

2.1 Regulatory Overview

Regulated or sensitive biological resources reviewed and analyzed herein include special status plant and animal species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement, and other locally protected resources, such as protected trees. Regulatory authority over biological resources is shared by federal, state, and local authorities. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions (in this instance, the City of Thousand Oaks).

Biological resources that are analyzed in this report are generally regulated in accordance with the following statutes:

- California Environmental Quality Act (CEQA)
- Federal Endangered Species Act (FESA)
- California Endangered Species Act (CESA)
- Federal Clean Water Act (CWA)
- California Fish and Game Code (CFGC)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- City of Thousand Oaks General Plan and Municipal Code

2.2 Desktop Review

Rincon conducted a literature and database review to identify sensitive biological resources that have been previously documented on, or in the vicinity of, the project site. The literature reviewed for this report is based on the currently proposed site plans for the project, previous reports related to this project (Padre Associates, Inc. 2019), and publicly available aerial images. Queries of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB, CDFW 2021a) and the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants (CNPS 2021) were conducted to obtain comprehensive information regarding special status species that have been recorded within a 5-mile radius of the project site. For CNPS query purposes, a 9-quadrangle search area centered on the project site was used.

In addition, regionally occurring sensitive biological resources and geological and hydrological information related to the site were researched from the following sources:

- USFWS Critical Habitat Portal (USFWS 2021a)
- USFWS Information, Planning, and Conservation System (USFWS 2021b)
- USFWS National Wetland Inventory (NWI) Mapper (USFWS 2021c)
- Natural Resources Conservation Service (NRCS) Web Soil Survey (United States Department of Agriculture [USDA], NRCS 2021a)

2.3 Field Survey

Field surveys were conducted to document the existing site conditions and to evaluate the potential presence of sensitive biological resources, including special status plant and animal species, sensitive plant communities, potentially jurisdictional wetlands and aquatic resources, and habitat for federally and state protected species. The first survey was conducted by Rincon biologists Robin Murray and Carolyn Welch on April 23, 2021. Weather conditions during the survey included an average temperature of 62 degrees Fahrenheit, calm winds up to three miles per hour, and mostly cloudy skies with good visibility. A second field survey was conducted by Robin Murray and Carolyn Welch on April 30, 2021. Weather conditions during the survey included an average temperature of approximately 92 degrees Fahrenheit, calm winds up to five miles per hour, and clear skies with good visibility.

The surveys included the project site boundaries plus a 500-foot survey buffer, defined as the wildlife survey area, which was surveyed for wildlife and vegetation communities. In addition, a buffer of 100 feet around the project site boundaries, defined as the jurisdictional delineation/rare plant survey area, was evaluated for rare plants and jurisdictional resources (Figure 2). Accessible portions of each survey area were surveyed on foot and inaccessible areas were observed remotely with 10x25 binoculars. Portions of the wildlife survey area that were burned in the 2018 Hill Fire were assessed to document current conditions.

Biological resources observed in the wildlife survey area were recorded, including plant and wildlife species. Plant species nomenclature and taxonomy follows *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012). The rare plant surveys were floristic in nature (i.e., all plants encountered were identified to the lowest taxonomic level necessary to determine rarity) and generally followed the *CNPS Botanical Survey Guidelines* (CNPS 2001) and the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018). Field surveys were scheduled during the appropriate blooming period to optimize detection of rare plant species with potential to occur within the study area. On April 23, Robin Murray conducted a reference site visit of a known population of Lyon's pentachaeta (*Pentachaeta lyonii*; federally endangered, state endangered, CRPR 1B.1). Occurrence number 27, situated approximately 8 miles southeast of the study area, was observed to be blooming and readily identifiable, validating the survey timing.

3 Existing Conditions

The following provides a summary of existing conditions in the wildlife survey area based on the desktop review and field surveys and presents a compilation of biological resources that occur, or have the potential to occur, in each survey area. Particular attention was paid to any conditions that were observed to have changed since the 2018 Hill Fire. Sensitive resources are discussed in Section 4. Site photographs are provided in Appendix B.

3.1 Topography and Soils

Topography in the wildlife survey area consists of elevations ranging between approximately 460 feet above mean sea level on the east side of the survey area to 250 feet above mean sea level in Arroyo Conejo Creek.

The wildlife survey area contains five mapped soil types: Gilroy loam, 15 to 50 percent slopes, very rocky; Hambright very rocky loam, 15 to 75 percent slopes; Metz loamy sand, loamy substratum, 0 to 2 percent slopes; Riverwash; and Vina loam, 2 to 9 percent slopes (USDA, NRCS 2021a). Of these soil types, only Riverwash is rated as hydric (USDA, NRCS 2021b).

Gilroy Loam, 15 to 50 Percent Slopes, Very Rocky

Gilroy series soils are moderately deep, well drained soils that occur on upland hillslopes and mountains. These soils are derived from weather igneous and metamorphic rock. A typical soil profile consists of clay loam topsoil to 21 inches with underlining basic igneous rock to a depth of 28 inches. This soil map unit is not on the National Hydric Soils List (USDA, NRCS 2021b).

Hambright Very Rocky Loam, 15 to 75 Percent Slopes

Hambright series soils are shallow, well drained soils that occur on plateaus, basalt flats, and hillslopes. These soils are derived from weathered igneous rocks, predominantly basalt. A typical soil profile consists of a very stony loam topsoil to 12 inches and underlain with basic igneous bedrock. This soil map unit is not on the National Hydric Soils List (USDA, NRCS 2021b).

Metz Loamy Sand, Loamy Substratum, 0 to 2 Percent Slopes

Metz series soils are very deep and somewhat excessively drained soils that occur on floodplains and alluvial fans. These soils are formed predominantly by sedimentary rock. A typical soils profile consists of fine sandy loam in the top 12 inches that transitions to find sand and then sand to a depth of 38 inches. This soil map unit is not on the National Hydric Soils List (USDA, NRCS 2021b).

Riverwash

Riverwash occurs within and along perennial and intermittent streams including the Arroyo Conejo. Drainage is excessive due to the stony and gravelly soils. The land is typically inundated following storms and highly subject to scouring. This soil map unit is included on the National Hydric Soils List (USDA, NRCS 2021b).

Vina Loam, 2 to 9 Percent Slopes

Vina series soils are very deep, well drained soils that occur on alluvial fans. These soils are derived from volcanic rock. The typical soil profile consists of a loam topsoil to 36 inches underlining by fine sandy loam to a depth of 66 inches. This soil map unit is not on the National Hydric Soils List (USDA, NRCS 2021b).

3.2 Watershed and Drainages

The jurisdictional delineation survey area is located in both the Upper Conejo Arroyo watershed (HUC12 number 180701030104) and the Lower Conejo Arroyo watershed (HUC12 number 180701030105) (USGS 2021). The National Hydrography Dataset (NHD) and NWI identify two hydrologic features within the jurisdictional delineation survey area: the Arroyo Conejo and the North Fork Arroyo Conejo. The Arroyo Conejo is documented in NHD and NWI as a perennial stream. The NHD also identifies the North Fork Arroyo Conejo as a perennial stream; however, in contrast the NWI documents the North Fork Arroyo Conejo and its associated riparian habitat as a temporarily flooded palustrine shrub/scrub wetland. The perennial nature of both streams observed in the jurisdictional delineation survey area is consistent with the descriptions in the NHD. It is noted that the mapping presented in the NHD and NWI provide useful context but are not a completely accurate depiction of current conditions or extent of jurisdiction in the jurisdictional delineation survey area, particularly regarding alignment and flow regime of streams.

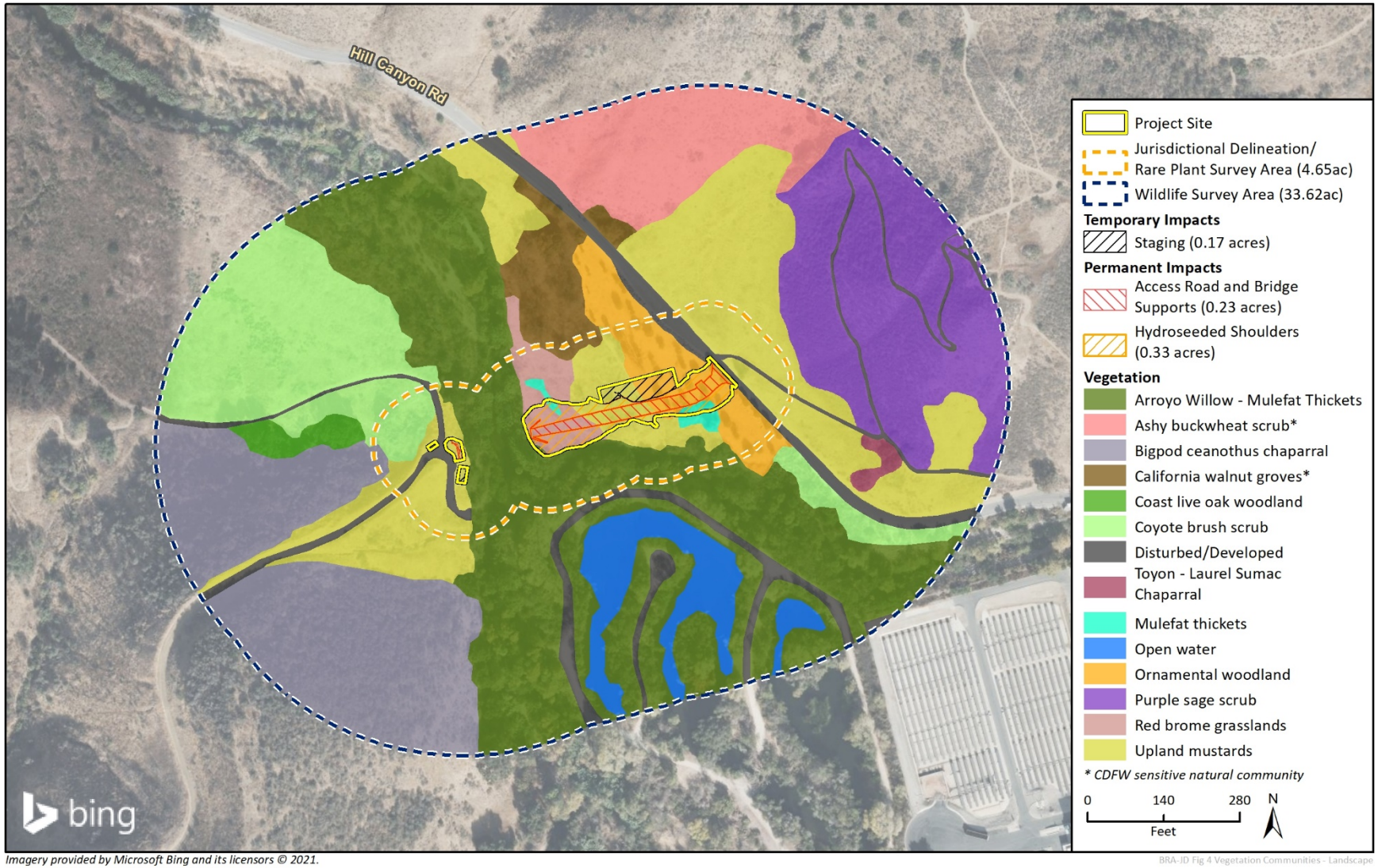
Both Arroyo Conejo and the North Fork Arroyo Conejo were observed with flowing surface water during the field surveys. Fire impacts were evident in the charred trunks of riparian shrubs and trees in the northern downstream portion of Arroyo Conejo. Some trees appeared to be dead; however, many trees and shrubs showed evidence of significant regrowth since the 2018 Hill Fire.

Additional detail on these resources can be found in the June 2021 Jurisdictional Delineation Report (Appendix E, Rincon 2021a).

3.3 Land Cover and Vegetation

The vegetation classification nomenclature used for characterizing vegetation is based on Sawyer et al. (2009). Fourteen vegetation communities and land cover types occur in the wildlife survey area: arroyo willow – mulefat thickets, ashy buckwheat scrub, bigpod ceanothus chaparral, California walnut groves, coast live oak woodland, coyote brush scrub, toyon-laurel sumac chaparral, mulefat thickets, purple sage scrub, red brome grasslands, upland mustards, open water, ornamental woodland, and disturbed/developed (Figure 4). Two of these vegetation communities are considered sensitive natural communities by the CDFW: California walnut groves and ashy buckwheat scrub (CDFW 2020). A total of 73 plant species were identified in the wildlife survey area during the survey, of which 32 percent are ornamental or weedy, non-native species. For a list of all plant species observed during the field survey, see Attachment C.

Figure 4 Vegetation Communities and Land Cover Types



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Additional data provided by City of Thousand Oaks, 2019.

BRA-JD Fig 4 Vegetation Communities - Landscape

Arroyo Willow - Mulefat Thickets (*Salix lasiolepis – Baccharis salicifolia* Shrubland Association)

This shrubland alliance is typically found along stream banks and benches, slope seeps, and stringers along drainages from 0 to 7,120 feet (0 to 2,170 meters) in elevation. Arroyo willow (*Salix lasiolepis*) provides at least 50 percent relative cover in the tree or shrub canopy, at least 25 percent absolute cover in the tree or shrub canopy, or at least 30 percent relative cover in the shrub canopy. Mulefat (*Baccharis salicifolia*) is present as a subdominant species in the shrub layer of this association. This vegetation community is ranked G4S4 and is not considered sensitive (CDFW 2020).

In the wildlife survey area, this vegetation community is found within the banks of Arroyo Conejo Creek and Forth Fork Arroyo Conejo Creek, as well as on the banks of the Hill Canyon Treatment Plant treatment ponds. Arroyo willow is co-dominant in the tree and shrub canopies along with giant reed (*Arundo donax*) and mulefat. Occasional coast live oak (*Quercus agrifolia*) and Mexican fan palm (*Washingtonia robusta*) are present in the tree canopy. Other species commonly encountered in the shrub layer include sandbar willow (*Salix exigua*) and poison oak (*Toxicodendron diversilobum*). Herbaceous species present include ripgut brome (*Bromus diandrus*) and ragweed (*Ambrosia psilostachya*). Parts of this vegetation community, especially in the northern portion of the wildlife survey area show evidence of fire damage, as trees and shrubs have charred branches and trunks. The wildlife survey area contains 8.64 acres (26 percent) of this association.

Ashy Buckwheat Scrub (*Eriogonum cinereum* Shrubland Association)

This shrubland alliance is generally found on sunny, steep slopes that are often rocky or eroded with soils that have developed from sandstone, shale, or volcanic substrates. Elevations range between 0 to 3,937 feet (0 to 1,200 meters). Ashy buckwheat (*Eriogonum cinereum*) is dominant with over 50 percent relative cover in the shrub layer. This vegetation community association is ranked G2G3S2S3 and is considered sensitive (CDFW 2020).

This vegetation community is present in the northern portion of the wildlife survey area, on the hillside to the east of Hill Canyon Road. Ashy buckwheat is dominant in the open shrub layer, with deerweed (*Acmispon glaber*), California buckwheat (*Eriogonum fasciculatum*), and chaparral yucca (*Hesperoyucca whipplei*) present as subdominant species. A dense herbaceous layer is present, consisting primarily of black mustard (*Brassica nigra*) and red brome (*Bromus rubens*). The wildlife survey area contains 2.12 acres (6 percent) of this association.

Bigpod Ceanothus Chaparral (*Ceanothus megacarpus* Shrubland Alliance)

This shrubland alliance is found on various topographies between 328 to 2,460 feet (100 to 750 meters) in elevation. Bigpod ceanothus (*Ceanothus megacarpus*) is dominant with at least 50 percent relative cover in the shrub canopy. This vegetation community is ranked G4S4 and is not considered sensitive (CDFW 2020).

This community is located on the hillsides in the western and southwestern portions of the wildlife survey area, west of Arroyo Conejo Creek. The dense shrub layer is composed primarily of bigpod ceanothus. Herbaceous species present include black mustard, red brome, and ripgut brome. The wildlife survey area contains 4.58 acres (14 percent) of this alliance.

California Walnut Groves (*Juglans californica* Forest & Woodland Alliance)

This woodland alliance is typically found on hillslopes and riparian corridors between 490 to 2,950 feet (150 to 900 meters) in elevation. California walnut (*Juglans californica*) is dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), two petaled ash (*Fraxinus dipetala*), toyon (*Heteromeles arbutifolia*), coast live oak, valley oak (*Quercus lobata*), red willow (*Salix laevigata*), arroyo willow, blue elderberry (*Sambucus nigra* ssp. *caerulea*) and California bay (*Umbellularia californica*). This alliance is ranked G3S3 and is considered sensitive (CDFW 2020).

This alliance is present in the central northern portion of the wildlife survey area between Arroyo Conejo Creek and Hill Canyon Road, and just east of Hill Canyon Road. California walnut is the dominant tree species, and the sparse shrub layer consists primarily of blue elderberry and California wild rose (*Rosa californica*). The majority of trees in the California walnut groves show evidence of fire damage. Many trees have charred trunks and branches. A dense herbaceous layer is present, dominated by black mustard. The wildlife survey area contains 0.84 acre (2.5 percent) of this alliance.

Coast Live Oak Woodland (*Quercus agrifolia* Forest & Woodland Alliance)

This woodland alliance is typically found along alluvial terraces, canyon bottoms, stream banks, slopes, and flats between 0 to 3,940 feet (0 to 1,200 meters) in elevation. Coast live oak occurs at over 50 percent cover in the tree layer. This vegetation community is ranked G5S4, which is not considered sensitive (CDFW 2020).

In the wildlife survey area, this vegetation community occurs in the uplands west of Arroyo Conejo Creek. Coast live oaks are dominant in tree canopy, and blue elderberry and poison oak (*Toxicodendron diversilobum*) are present in the sparse shrub layer. Herbaceous species present include black mustard, red brome, and ripgut brome. Trees and shrubs in this vegetation community show evidence of fire damage. The wildlife survey area contains 0.27 acre (0.8 percent) of this alliance.

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)

This shrubland alliance is typically found on river mouths, stream sides, terraces, stabilized dunes of coastal bars, spits along the coastline, coastal bluffs, open slopes, and ridges between 0 to 4,921 feet (0 to 1,500 meters) in elevation. Soils are variable, from sandy to relatively heavy clay. Coyote brush (*Baccharis pilularis*) makes up more than 50 percent of the shrub layer. California coffeeberry (*Frangula californica*), poison oak, and coast silk tassel (*Garrya elliptica*) may be present as codominant species. This vegetation community is ranked G5S5 and is not considered sensitive (CDFW 2020).

This vegetation community is found on the uplands west of Arroyo Conejo Creek in the northwest portion and southeast corner of the wildlife survey area. Coyote brush is dominant in the open shrub layer, with scattered mulefat and blue elderberry. The dense herbaceous layer is dominated by black mustard. This area shows evidence of fire damage. This community is also located within the eastern portion of the wildlife survey area, between the North Fork Arroyo Conejo Creek and Hill Canyon Road. The shrub layer in this area is dense and consists primarily of coyote brush, California sagebrush (*Artemisia californica*), giant wild rye (*Elymus condensatus*), and laurel sumac (*Malosma laurina*). The wildlife survey area contains 3.38 acres (10 percent) of this alliance.

Toyon - Laurel Sumac Chaparral (*Heteromeles arbutifolia – Malosa laurina* Shrubland Association)

This shrubland alliance is typically found on steep, north-facing slopes with soils derived from bedrock of colluvium, between 165 to 4,265 feet (50 to 1,300 meters) in elevation. Holly leaf cherry (*Prunus ilicifolia*), toyon, or greenbark ceanothus (*Ceanothus spinosus*) provide at least 50 percent relative cover in the shrub canopy. In this association, toyon is co-dominant with laurel sumac in the shrub layer. This vegetation community is ranked G5S4 and is not considered sensitive (CDFW 2020).

This community is present in a small area in the eastern portion of the wildlife survey area, north of Hill Canyon Road. Toyon is dominant in the shrub layer, with laurel sumac present as a subdominant species. The dense herbaceous layer is dominated by black mustard, red brome, and ripgut brome. The wildlife survey area contains 0.1 acre (0.3 percent) of this alliance.

Mulefat Thickets (*Baccharis salicifolia* Shrubland Alliance)

Mulefat thickets are typically found within canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels, within mixed alluvial soils between 0 to 4,100 feet (0 to 1,250 meters) in elevation. Mulefat contributes to at least 30 percent relative cover in the shrub layer. This vegetation community is ranked G4S4 and is not considered sensitive (CDFW 2020).

In the wildlife survey area this alliance occurs in a small area on the uplands east of Arroyo Conejo Creek, between the ornamental woodland and upland mustards. This plant community is dominated by mulefat with scattered blue elderberry. The dense herbaceous layer is dominated by black mustard, red brome, and ripgut brome. This community is also present in a small area east of Arroyo Conejo Creek, surrounded by red brome grasslands. The area appears to have completely burnt in the 2018 Hill Fire and is currently populated by mulefat saplings and herbaceous non-natives. The wildlife survey area contains 0.1 acre (0.3 percent) of this alliance.

Purple Sage Scrub (*Salvia leucophylla* Shrubland Alliance)

This shrubland alliance is typically found along slopes of variable aspect between 165 to 3,035 feet (50 to 925 meters) in elevation. Purple sage (*Salvia leucophylla*) is present at over 30 percent relative cover and is often codominant with California sagebrush in the shrub layer. This vegetation community is ranked G4S4, which is not considered sensitive (CDFW 2020).

This vegetation community is present within the eastern portion of the wildlife survey area, on the hillsides northwest of Hill Canyon Road. Purple sage is dominant in the dense shrub layer, and scattered California bush sunflower (*Encelia californica*) are present. The sparse herbaceous layer is dominated by black mustard and red brome. The wildlife survey area contains 3.55 acres (11 percent) of this alliance.

Red Brome Grasslands (*Bromus rubens* Herbaceous Semi-Natural Alliance)

This herbaceous semi-natural alliance can be found in various topographies and soil settings, between 0 to 7,215 feet (0 to 2,200 meters). Red brome is dominant with over 80 percent cover in the herbaceous layer. This vegetation community is ranked GNASNA and is not considered sensitive (CDFW 2020).

This vegetation community is found in the center of the wildlife survey area, east of Arroyo Conejo Creek. Red brome is dominant in the dense herbaceous layer, with ripgut brome, black mustard,

summer mustard (*Hirschfeldia incana*), and fennel (*Foeniculum vulgare*) present as subdominant species. According to aerial imagery, this vegetation community was completely burned in the 2018 Hill Fire; however, non-native herbaceous species obscure any evidence of fire damage. The wildlife survey area contains 0.47 acre (1.4 percent) of this alliance.

Upland Mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance

This herbaceous semi-natural alliance is typically found in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, cleared roadsides, and waste places between 0 to 4,920 feet (0 to 1,500 meters) in elevation. Black mustard, summer mustard, wild radish (*Raphanus sativus*), or other mustards occur with non-native plants at over 80 percent cover in the herbaceous layer. This vegetation community is ranked GNASNA and is not considered sensitive (CDFW 2020).

This vegetation community is present throughout the wildlife survey area and is dominated by black mustard in the dense herbaceous layer. Other commonly encountered herbaceous species include summer mustard, ripgut brome, fennel, and Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*). Parts of this community burned in the 2018 Hill Fire; however, non-native herbaceous species obscure any evidence of fire damage. The wildlife survey area contains 5.28 acres (16 percent) of this alliance.

Open Water

The open water land cover type consists of areas with standing water that lacks a natural or artificial canopy. In the wildlife survey area, open water is present in treatment ponds in the Hill Canyon Treatment Plant facility. The wildlife survey area contains 1.15 acres (3 percent) of this land cover type.

Ornamental Woodland

Ornamental areas have been planted for the purpose of landscaping, often with non-native species that require regular irrigation or other maintenance. Rows of planted non-native southern live oak trees (*Quercus virginiana*) are present along the eastern portion of the wildlife survey area west of Hill Canyon Road. The herbaceous understory consists primarily of black mustard and summer mustard. The wildlife survey area contains 1.06 acres (3 percent) of this land cover type.

Disturbed/Developed

Disturbed/developed habitats have been physically altered by human activity. Disturbed habitats are not recognizable as a native or naturalized vegetation association but continue to retain a soil substrate. Vegetation of disturbed areas, where present, is typically composed of ruderal exotics that thrive in disturbed soil conditions. Developed land includes areas that have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. It is characterized by permanent or semi-permanent structures, pavement or hardscape, and landscaped areas that often require irrigation.

The disturbed/developed land cover type is present throughout the wildlife survey area and includes Hill Canyon Road, unpaved trails, and facilities associated with the Hill Canyon Treatment Plant. The wildlife survey area contains 1.93 acres (6 percent) of this land cover type.

3.4 Wildlife

The wildlife survey area provides suitable habitat for numerous wildlife species due to its native vegetation communities and the riparian corridors associated with Arroyo Conejo and North Fork Arroyo Conejo, as well as its location within open space. Wildlife use throughout the wildlife survey area was high and dominated by bird species found in woodland, scrub, riparian, and chaparral habitats. Species observed included mallard (*Anas platyrhynchos*), California scrub-jay (*Aphelocoma californica*), red-tailed hawk (*Buteo jamaicensis*), Anna's hummingbird (*Calypte anna*), California towhee (*Melozone crissalis*), lesser goldfinch (*Spinus psaltria*), and mourning dove (*Zenaida macroura*). In addition, southern Pacific rattlesnake (*Crotalus oreganus helleri*), western fence lizard (*Sceloporus occidentalis*), California mule deer (*Odocoileus hemionus californicus*), and California ground squirrel (*Otospermophilus beecheyi*) were observed within the wildlife survey area. A woodrat midden (*Neotoma* sp.) was observed in the wildlife survey area.

Wildlife species observed in the wildlife survey area during the survey are included in Appendix C. Other common species of bird, reptile, and small mammal are expected to occupy or pass through the site but were not observed.

4 Sensitive Biological Resources

This section evaluates the potential for sensitive biological resources to occur in the rare plant survey area and the wildlife survey area. Local, state, and federal agencies regulate special status species and other sensitive biological resources and require an assessment of their potential presence to be conducted prior to the approval of any proposed development on a property.

4.1 Special Status Species

Special status species are those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the USFWS under the FESA; those listed or candidates for listing as rare, threatened, or endangered by the CDFW under the CESA or Native Plant Protection Act; animals designated as "Fully Protected" by the CFGC; animals listed as "Species of Special Concern" (SSC) by the CDFW; CDFW Special Plants, specifically those with California Rare Plant Ranks (CRPR) of 1B, 2, 3, and 4 in the CNPS's Inventory of Rare and Endangered Vascular Plants of California (CDFW 2021b, CDFW 2021c, CNPS 2021).

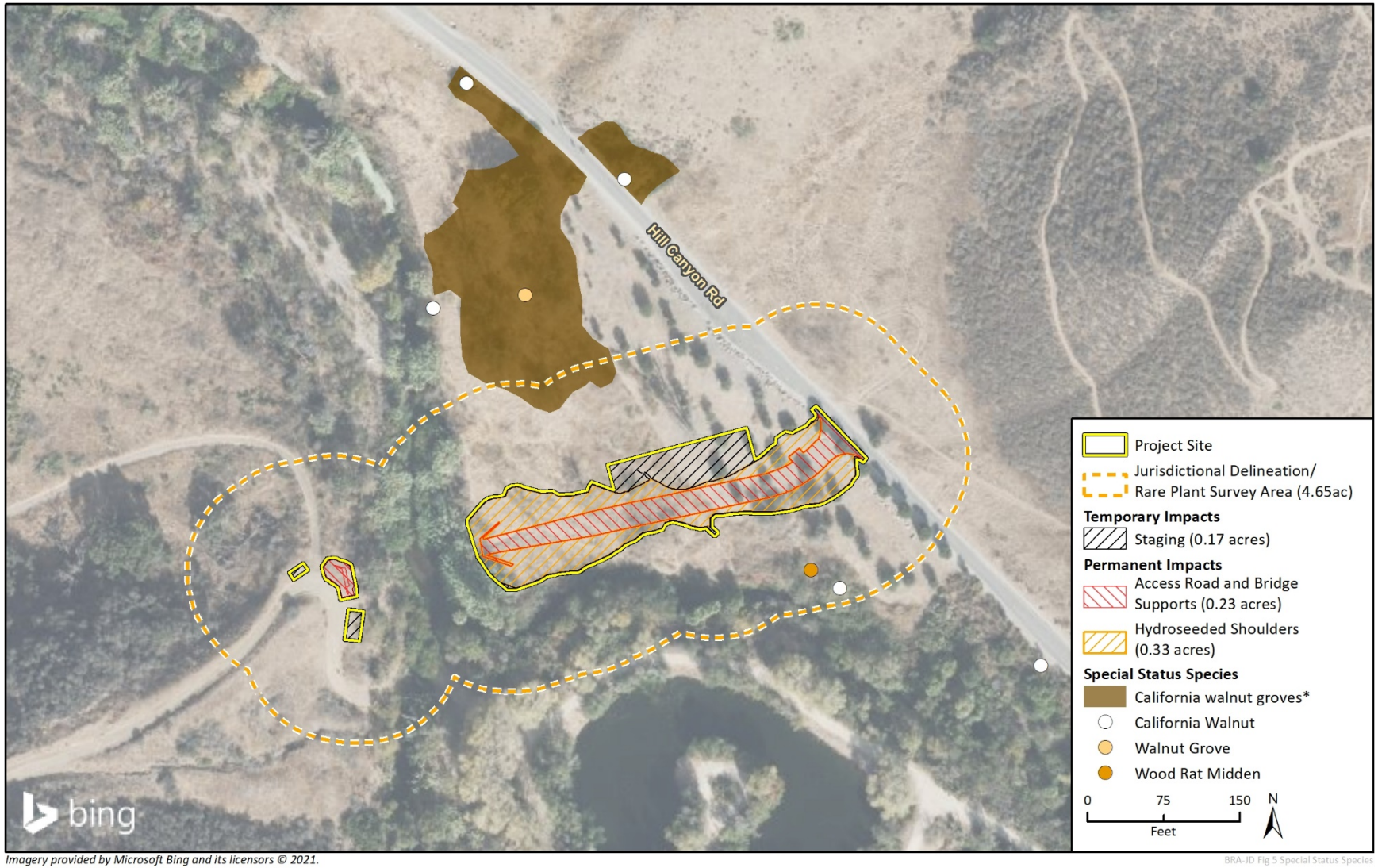
Assessments for the potential occurrence of special status species are based upon known ranges, habitat preferences, and occurrence records from CNDDB and CNPS. The potential for special status species to occur in the rare plant survey area and the wildlife survey area was evaluated according to the following criteria:

- **Not Expected.** Habitat on and adjacent to the project site is clearly unsuitable for the species' requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).
- **Low Potential.** Few of the habitat components meeting the species' requirements are present and/or the majority of habitat on and adjacent to the project site is unsuitable or of poor quality. The species is not likely to be found on the project 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 project site is unsuitable. The species has a moderate probability of being found on the project 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 project site is suitable. The species has a high probability of being found on the project site.
- **Present.** Species is observed on the project site or has been recorded (e.g., CNDDB, other reports) on the project site recently (within the last five years).

4.1.1 Special Status Plants

Special status plant species typically have specialized habitat requirements, including plant community types, soils, and elevational ranges. The CNDDB and CNPS queries identified 51 special status plant species that have been previously recorded in the search area, of which 14 were documented within five miles. California walnut was the only special status plant species observed during the field survey. A grove of California walnuts was documented approximately 40 feet north of the project site that extends to the north on the north and south sides of Hill Canyon Road (Figure 5).

Figure 5 Special Status Species



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Additional data provided by City of Thousand Oaks, 2019.

BRA-JD Fig 5 Special Status Species

The rare plant survey area contains natural habitats that may be suitable for some of the special status species not observed during the surveys. Of the 51 special-status plant species identified in the database queries, 47 are not expected to occur because habitat on and adjacent to the project site is clearly unsuitable for the species' requirements. It should be noted that although Critical Habitat for Lyon's pentachaeta (*Pentachaeta lyonii*) is located approximately 200 feet to the north of the wildlife survey area, this species is not expected to occur due to the absence of shallow soils and high density of grasses. The following four special status plant species have a low potential to occur to occur within the rare plant survey area based on the presence of marginally suitable habitat:

- Catalina mariposa-lily (*Calochortus catalinae*, CRPR 4.2)
- Western dichondra (*Dichondra occidentalis*, CRPR 4.2)
- White-veined monardella (*Monardella hypoleuca* ssp*. hypoleuca*, CRPR 1B.3)
- Chaparral ragwort (*Senecio aphanactis*, CRPR 2B.2)

The species reasonably anticipated to occur were determined based on the published ranges of the species, and the type, extent, and condition of habitat available within the rare plant survey area. All of these species would have been optimally detectable during the April survey, but were not observed. Potential to occur conclusions are further discussed in Appendix D.

4.1.2 Special Status Wildlife

Based on the database and literature review, 26 special status wildlife species are known or have the potential to occur in the vicinity of the wildlife survey area (Appendix D). Of these 26 species, two were documented on-site during previous biological field surveys (Padre Associates, Inc. 2018), four have a high potential to occur, seven have a moderate potential to occur, nine have a low potential, and the remaining four special status species are not expected to occur based on a lack of suitable habitat. The species reasonably anticipated to occur were determined based on the published ranges of the species, and the type, extent, and condition of habitat available at the site. No special status wildlife species were observed within the wildlife survey area during the surveys conducted by Rincon.

Special status species or other protected species with high or moderate potential to occur within or adjacent to the wildlife survey area are discussed below, and, if applicable, evaluated under Section 5. Species with a low potential to occur are omitted from further discussion, because these species are not expected to be present. The following species have a moderate to high potential to occur.

- Arroyo chub (*Gila orcuttii*), CDFW Species of Special Concern (SSC) – High Potential
- Coastal whiptail (*Aspidoscelis tigris stejnegeri*), SSC – Moderate Potential
- Western pond turtle (*Emys marmorata*), SSC – High Potential
- Coast horned lizard (*Phrynosoma blainvillii*), SSC – Moderate Potential
- Two-striped gartersnake (*Thamnophis hammondii*), SSC – Moderate Potential
- Cooper's hawk (*Accipiter cooperii*), Watch List – Present
- Yellow-breasted chat (*Icteria virens*, SSC) – Moderate Potential
- Yellow warbler (*Setophaga petechia*), SSC – Present
- Least Bell's vireo (*Vireo bellii pusillus*), Federally Endangered and State Endangered – High Potential

- Hoary bat (*Lasiurus cinereus*), Western Bat Working Group (WBWG) Moderate Priority – Moderate Potential
- Western small-footed myotis (*Myotis ciliolabrum*), WBWG Moderate Priority– Moderate Potential
- San Diego desert woodrat (*Neotoma lepida intermedia*), SSC – Present

Arroyo Chub

Arroyo chub is a CDFW SSC that has a high potential to occur within the wildlife survey area. This freshwater fish species is most common in slow-flowing streams characterized by a substrate of sand or mud but can also occur in faster-flowing streams with coarse substrate. Spawning generally occurs between February and August. This species has a varied diet that includes algae, aquatic plants, and invertebrates (Calfish 2021). In the wildlife survey area, this species may occur in Arroyo Conejo and North Fork Arroyo Conejo. A CNDDB occurrence of this species from 2020 overlaps with the wildlife survey area, and the presence of suitable habitat was confirmed during field surveys.

Coastal Whiptail

Coastal whiptail is a CDFW SSC. This species inhabits deserts and semi-arid areas within sparse vegetation and open areas, woodlands, and riparian areas. The species may occur throughout the wildlife survey area, i.e., in any of the natural vegetation communities or in the ornamental woodland habitat within the wildlife survey area. Typically, the breeding period is from May to August (California Herps 2021). While there are no CNDDB observations located within 5 miles of the wildlife survey area, the species has a moderate potential to occur within the wildlife survey area due to the presence of suitable habitat.

Western Pond Turtle

Western pond turtle is a CDFW SSC with a moderate potential to occur within the wildlife survey area. The species is highly aquatic and found in or near ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches. Specifically, the species may occur within the arroyo willow – mulefat thickets adjacent to and within Arroyo Conejo Creek and North Fork Arroyo Conejo. The species breeds between March and June (California Herps 2021). In addition, potentially suitable basking sites of grassy open fields are present within the wildlife survey area. A CNDDB occurrence from 2000 overlaps with the wildlife survey area, and the presence of suitable habitat was confirmed during field surveys.

Coast Horned Lizard

Coast horned lizard is a CDFW SSC that can be found in grasslands, coniferous forests, woodlands, and chaparral, containing open areas and patches of loose soil. The wildlife survey area contains potentially suitable habitat, particularly in the red brome grasslands, bigpod ceanothus chaparral, and coyote brush scrub habitats. Potentially suitable soils are present; however, non-developed open areas are limited due to the dense herbaceous layer. The only CNDDB occurrence within 5 miles of the wildlife survey area is located approximately 2.5 miles north of the wildlife survey area; however, based on the presence of suitable habitat this species has a moderate potential to occur.

Two-Striped Gartersnake

Two-striped garter snake is a CDFW SSC with a moderate potential to occur within the wildlife survey area. The species is highly aquatic and found in or near permanent fresh water along streams with rocky beds and riparian growth. Specifically, the species may occur within the arroyo willow – mulefat thickets adjacent to and within Arroyo Conejo Creek and North Fork Arroyo Conejo. The species breeds in late March and early April, with young born between July and October (California Herps 2021). The most recent CNDDB occurrence within 5 miles of the wildlife survey area is from 2009 and is located approximately 4.75 miles south of the wildlife survey area.

Cooper's Hawk

Cooper's hawk is a CDFW Watch List species and was observed during the 2018 field surveys conducted by Padre Associates, Inc.; therefore, this species is assumed present. The species prefers mature forest, open woodlands, wood edges, and river groves and nests in coniferous, deciduous, and mixed woods with tall trees with openings or edge habitat nearby (Audubon 2021). Specifically, the species may forage for birds and small animals within the entire wildlife survey area and nest in the coast live oak woodland and California walnut grove habitats. This species breeds between February and July (Lees and Christie 2001).

Yellow-breasted Chat

Yellow-breasted chat is a CDFW SSC with a moderate potential to occur within the wildlife survey area. This migratory species prefers dense, brushy riparian areas along streams, swamps, and ponds. This species can also be found in upland woodland edges and thickets. The diet of this species consists of a diverse mix of insects and fruit (Audubon 2021). In the wildlife survey area, the arroyo willow – mulefat thickets along Arroyo Conejo and North Fork Arroyo Conejo provide suitable habitat for this species. However, no CNDDB observations of this species are located within five miles of the wildlife survey area.

Yellow Warbler

Yellow warbler, a CDFW SSC, was observed during the 2018 field surveys conducted by Padre Associates, Inc.; therefore, this species is assumed present. The species prefers riparian plant associations in close proximity to water. Specifically, the species may nest or forage within the arroyo willow – mulefat thickets habitat along Arroyo Conejo and North Fork Arroyo Conejo. The species breeds from April to October and western populations overwinter primarily in Mexico and northern Central America (Northwest Council 2018).

Least Bell's Vireo

The least Bell's vireo is a federally and state endangered species with a high potential to occur in the wildlife survey area. This species is a summer resident of southern California in riparian areas in the vicinity of water or in dry river bottoms below 2,000 feet. The least Bell's vireo arrives at breeding grounds mid to late March and leaves late September. Its nests are placed along margins of bushes or on twigs projecting into pathways, usually willow species. The species prefers dense shrubby understory. Threats to the species include degradation of breeding habitat as well as brood parasitism by brown-headed cowbirds (*Molothrus ater*). Potentially suitable riparian habitat is present in the wildlife survey area, especially in the arroyo willow – mulefat thickets along Arroyo Conejo and North Fork Arroyo Conejo. Multiple CNDDB occurrences have been documented within

5 miles of the wildlife survey area. However, all these observations are on Conejo Creek, of which Arroyo Conejo is a tributary. Modified protocol surveys for this species conducted in 2018 by Padre Associates, Inc. did not detect the species.

Hoary Bat

Hoary bat is a WBWG Moderate Priority species with a moderate potential to occur in the wildlife survey area. This is a widespread migratory species that winters in southern California. Solitary roosts are generally in trees with dense leaf coverage over an open area. This species mates in autumn, around the time of their migration. Their diet consists primarily of moths, though other insects are eaten as well (Animal Diversity Web 2021). In the wildlife survey area, suitable roosting habitat is found in the California walnut groves or coast live oak woodland, and foraging habitat is throughout the survey area. The nearest CNDDB occurrence of this species is from 2004 and is located approximately 11 miles to the southeast of the wildlife survey area.

Western Small-footed Myotis

Western small-footed myotis is a WBWG Moderate Priority species with a moderate potential to occur in the wildlife survey area. This species roosts primarily on cliff faces and rocky outcroppings, or on human-made structures. This species eats a variety of flying terrestrial insects, and their foraging range is generally restricted to within one kilometer of a water source (Animal Diversity Web 2021). Limited roosting habitat is present in the wildlife survey area; however, nearby rocky cliffs may be utilized. This species may forage near Arroyo Conejo and North Fork Arroyo Conejo. The nearest CNDDB occurrence of this species is from 2004 and is located approximately 9 miles to the east of the wildlife survey area.

San Diego Desert Woodrat

San Diego desert woodrat is a CDFW SSC assumed present within the wildlife survey area. The species is found in scrub habitats from San Luis Obispo County to San Diego County (CDFW 2021b), is abundant in rock outcrops, rocky cliffs, and slopes, and prefers moderate to dense canopies for cover. San Diego desert woodrat predominately preys on buds, fruits, seeds, bark, leaves, and young shoots of plant species. Middens are constructed with twigs, sticks, and rocks depending on material availability. The midden location is usually in the lower branches of trees. Middens are utilized for predator escape, nesting, and food storage (Zeiner et al. 1988). The species may nest in coyote brush scrub, big pod ceanothus chaparral, ashy buckwheat scrub, toyon – laurel sumac chaparral, or purple sage scrub habitats within the wildlife survey area. The nearest CNDDB occurrence is approximately four miles southwest of the project site. One woodrat midden was observed in the wildlife survey area during the field surveys (Figure 5). The project site is within the range of both San Diego desert woodrat and the more common dusky-footed woodrat (*Neotoma fuscipes*). For the purpose of this report, it is assumed that the woodrat nest observed is of the San Diego desert woodrat.

4.1.3 Nesting Birds

Under the provisions of the Migratory Bird Treaty Act (MBTA), it is unlawful “by any means or manner to pursue, hunt, take, capture (or) kill” any migratory birds except as permitted by regulations issued by the USFWS. The term “take” is defined by the USFWS regulation to mean to “pursue, hunt, shoot, wound, kill, trap, capture or collect” any migratory bird or any part, nest, or egg of any migratory bird covered by the conventions, or to attempt those activities. In addition, the

CFGC extends protection to non-migratory birds identified as resident game birds and any birds in the orders Falconiformes or Strigiformes (birds-of-prey) (CFGC Sections 3500 et seq.).

Although no nests or birds exhibiting nesting behaviors were observed during the survey, suitable habitat is present within the wildlife survey to support nesting birds.

4.2 Sensitive Plant Communities and Critical Habitats

For the purpose of this report, sensitive habitats include the following:

- Sensitive natural communities identified as part of the state Natural Heritage program and tracked by CDFW
- Certain vegetation alliances and associations identified by the CDFW Vegetation Classification and Mapping Program and/or certain communities and habitats specifically designated by local agencies
- Critical Habitat defined by the FESA under Section 3 and protected by the USFWS and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries

Based on results of the CNDDB query, the following sensitive natural communities designated as sensitive by CDFW (CDFW 2020) are documented within a five-mile radius of the project site: Southern Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, Valley Needlegrass Grassland, and Valley Oak Woodland.

Southern Riparian Scrub was documented in the wildlife survey area and is designated as arroyo willow – mulefat thickets herein, as described by Sawyer et al. 2009. Following current CDFW guidelines, this association is not considered a sensitive natural community (CDFW 2020). In addition, ashy buckwheat scrub and California walnut groves, both CDFW sensitive natural communities, were observed in the wildlife survey area, neither of which intersect with the project site impact boundaries.

No critical habitat designated by USFWS is present in the wildlife survey area. The closest critical habitat is for Lyon's pentachaeta, located approximately 200 feet north of the wildlife survey area (USFWS 2021a).

4.3 Jurisdictional Waters and Wetlands

4.3.1 Streams

Two perennial streams, the Arroyo Conejo and the North Fork Arroyo Conejo, were observed within the jurisdictional delineation survey area.

Arroyo Conejo

The Arroyo Conejo enters the jurisdictional delineation survey area from the southwest and flows in a northern direction to its confluence with the North Fork Arroyo Conejo. The stream has an ordinary high water mark (OHWM) defined by a bed and bank, change in vegetation, transition from cobble substrate to loam, and exposed roots and scour. In-channel unvegetated and vegetated gravel bars were also observed. The OHWM spans from approximately 30 feet wide upstream, approximately 50 feet just downstream of the confluence with the North Fork Arroyo Conejo and averaging 10 feet downstream of the confluence to the edge of the jurisdictional delineation survey

area. An arroyo willow riparian corridor extends on both sides of the OHWM between 20 and 90 feet. During the survey, the Arroyo Conejo contained fast moving water with an average depth of three feet. Several deep pools were observed in channel with depths greater than five feet. The Arroyo Conejo conveys stormwater from housing developments upstream and the natural surroundings of Conejo Canyon sheet flow during rain events. The Arroyo Conejo is classified in NHD and NWI as a perennial stream which is consistent with what was observed in the field.

North Fork Arroyo Conejo

The North Fork Arroyo Conejo enters the jurisdictional delineation survey area from the east and flows in western direction to its confluence with the Arroyo Conejo. This stream has an OHWM defined by a bed and bank, change in vegetation, transition from cobble substrate to coarse sand and sandy loam. The OHWM spans on average approximately 10 feet across. An arroyo willow riparian corridor extends north and south of the channel, fire damage to the north has limited the width to approximate 20 feet. The southern boundary of the riparian corridor is defined at the unpaved access roadway. During the survey water was observed flowing within the stream at an average depth of approximately two feet. Several deep pools were observed in channel with depths greater than five feet. The North Fork Arroyo Conejo conveys effluent from the Hill Canyon Treatment Plant upstream and stormwater from housing developments upstream and the natural surroundings sheet flow during rain events. Although NWI classifies this stream as a Palustrine shrub/scrub wetland, the NHD identifies the North Fork Arroyo Conejo as a perennial stream which is more consistent with what was observed in the field.

4.3.2 Wetlands

Emergent wetlands were observed adjacent to the Arroyo Conejo and North Fork Arroyo Conejo. These fringe wetlands are approximately 2.5 feet wide band of emergent hydrophytic vegetation including water speedwell (*Veronica anagallis-aquatica*) that lines the OHWM on either side of the stream. In areas where steep banks occur, no wetland vegetation was observed. Very little organic matter was observed within the coarse, sandy soils in this area, and no indicators of hydric soils were detected. The soils are mapped as Riverwash, a hydric soil. Soils were presumed hydric due to their context within a vegetated sand or gravel bar within a floodplain, a naturally problematic soil condition. Based on the results of sample points taken during the field surveys, this area meets the definition of a USACE wetland and may also be regulated by the RWQCB under the Porter-Cologne Act.

Arroyo Conejo and North Fork Arroyo Conejo are perennial features, have an OHWM, and a traceable hydrologic connection to federally jurisdictional waters and thus would be regulated under sections 404 and 401 of the CWA and may also be regulated by the RWQCB under the Porter-Cologne Act. All the streambed and streambank habitats up to the top of bank or edge of riparian habitat are subject to the jurisdiction of the CDFW pursuant to Section 1600 et seq. of the CFGC. Table 1 below shows the potential extent of resource agency jurisdiction within the jurisdictional delineation survey area. Potential jurisdictional areas within the jurisdictional delineation survey area are presented in Figure 6 and Figure 7.

Table 1 Potential Jurisdictional Areas within the Jurisdictional Delineation Survey Area

	USACE		CDFW	RWQCB	
Jurisdictional Area	Non-Wetland Waters of the U.S. (acres [lin. ft.])	Wetland Waters of the U.S. (acres [lin.ft.])	CDFW Jurisdictional Streambed (acres [lin. ft.])	Non-wetland Waters of the State (acres [lin. ft.])	Wetland Waters of the State (acres [lin. ft.])
Arroyo Conejo	0.16 (300)	0.03 (300)	0.84 (300)	0.16 (300)	0.03 (300)
North Fork Arroyo Conejo	0.10 (405)	0.04 (405)	1.64 (405)	0.10 (405)	0.04 (405)
Total	**0.26 (705)**	**0.07 (705)**	**2.47 (705)**	**0.26 (705)**	**0.07 (705)**

4.4 Wildlife Movement

Wildlife movements are expected to be concentrated in corridors of suitable habitat. Wildlife corridors are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as connecting foraging and breeding areas, or they may be regional in nature, allowing movement across the landscape. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then return. Regional and local wildlife movements are expected to be concentrated near topographic features that allow convenient passage, such as drainages and ridgelines. Examples of barriers or impediments to movement include housing and other urban development, roads, fencing, unsuitable habitat, or open areas with little vegetative cover.

Wildlife movement corridors can be both large- and small-scale. At the regional/landscape level scale, the Conejo Canyons area has been mapped as part of an essential wildlife connectivity area (Spencer et al. 2010). The wildlife survey area is in a wildlife corridor identified by the City of Thousand Oaks General Plan associated with Arroyo Conejo (City of Thousand Oaks 2013).

Arroyo Conejo and North Fork Arroyo Conejo are expected to function as localized and regional wildlife travel routes for common wildlife species. Although roads and trails cross the wildlife survey area, wildlife likely utilizes the woodland, grasslands, and shrublands present in the wildlife survey area as travel routes. The wildlife survey area is located adjacent to multiple previously developed areas and roads (e.g., Hill Canyon Road and the Hill Canyon Treatment Plant). The wildlife survey area supports localized wildlife movement and likely contributes to larger scale wildlife movement within the landscape.

The “South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection” (June 2006) study examined the needs of target species to identify regional corridor needs. The study recommended a “linkage design…to accommodate the full range of target species and ecosystem functions”. The recommended linkage design includes the Conejo Canyons area, which is recommended as part of a regional corridor from Pt. Mugu State Park to the Simi Hills and Santa Susana Mountains (Penrod 2006).

Figure 6 Potential Jurisdictional Areas

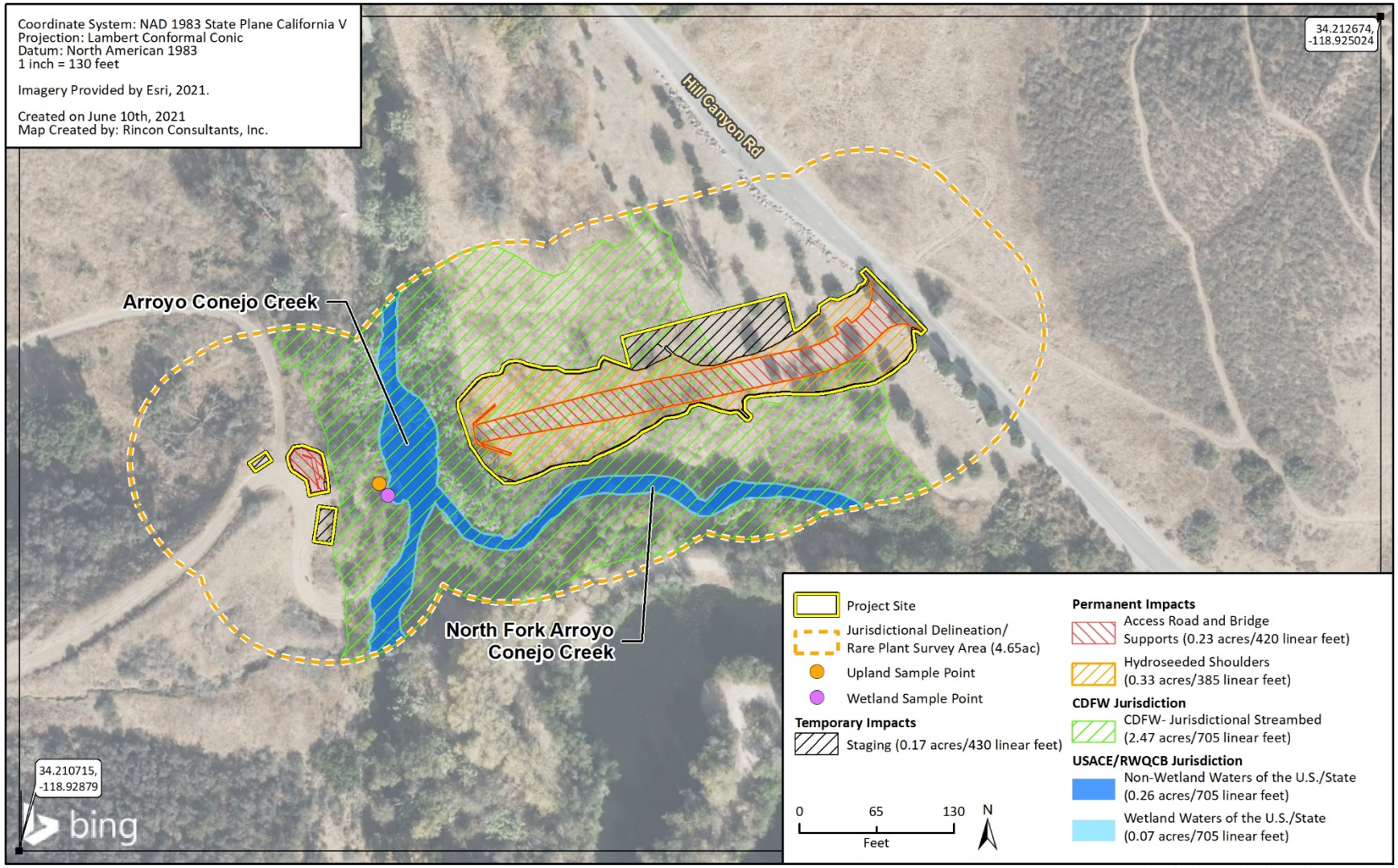

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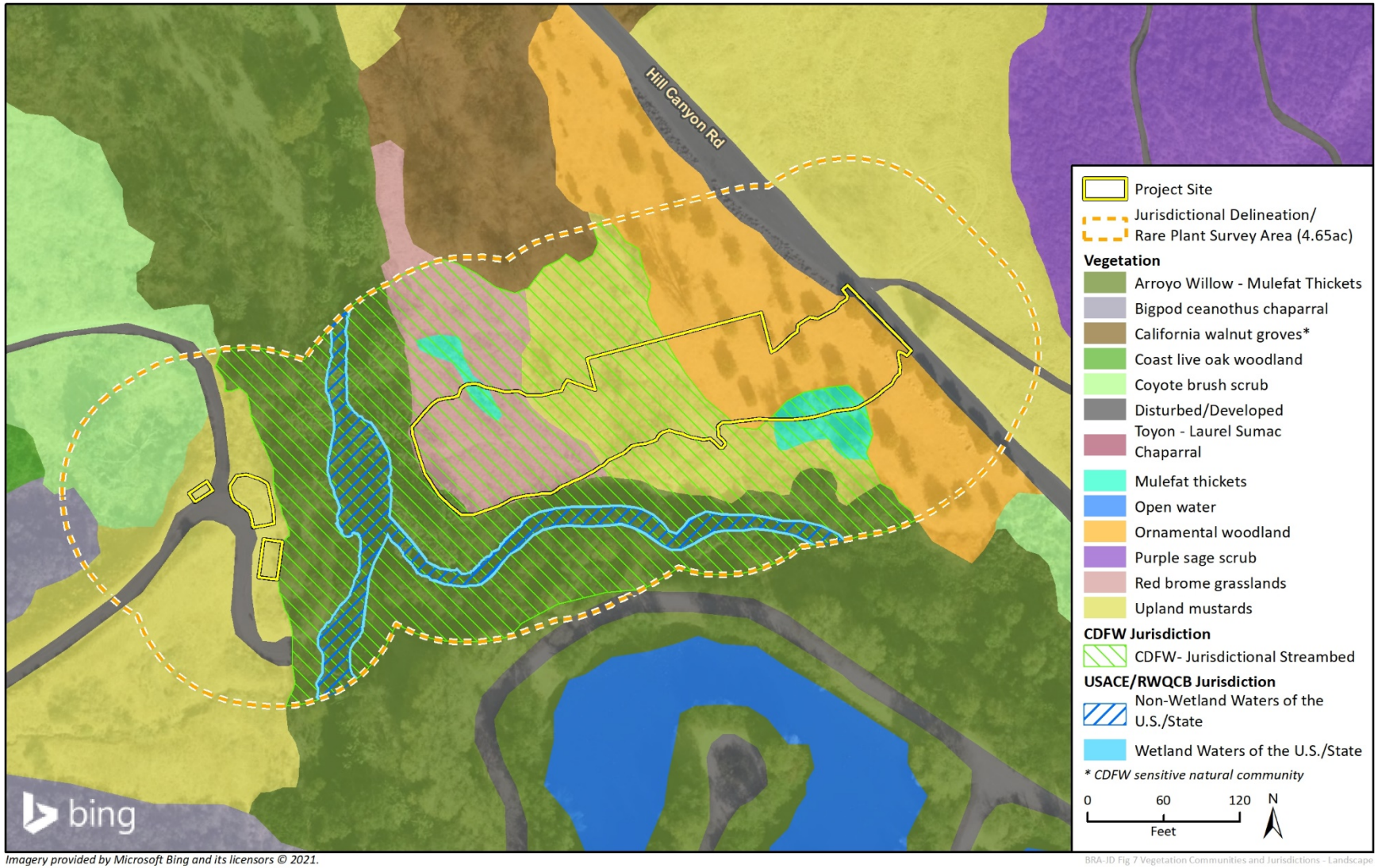
Figure 7 Jurisdictional Areas by Vegetation Community and Land Cover Type



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4.5 Resources Protected by Local Policies, Ordinances, and Plans

Conejo Canyons Management Plan

The project site is situated within the Conejo Canyons Management Plan Area managed by COSCA. The Conejo Canyons Management Plan (Management Plan) was prepared by COSCA in order to inventory the resources in the plan area, identify challenges and opportunities in managing these resources and suggest actions to be taken for the long-term management and environmental sustainability of the land and resources within the Conejo Canyons (COSCA 2010). Section 5 of the Management Plan identifies the plan's goals and objectives and recommends actions to be taken to achieve said goals and objectives. The goals address protection of biological resources including special status plant species and wildlife, as well as cultural resources and water quality. Goals are also provided for facilities, trails, emergency access, and public education/signage.

Thousand Oaks General Plan

The Conservation Element of the Thousand Oaks General Plan (City of Thousand Oaks 2013) provides guidance and "implied constraints with respect to human activities that affect" important local resources such as native plant communities, wildlife resources, wildlife movement corridors, oak and landmark trees, wetland and riparian areas, and rare, threatened, and endangered species (City of Thousand Oaks 2013). With the exception of the City's local tree ordinance, the resources listed above are also regulated by state and federal agencies as applicable.

Details about relevant local policies are summarized in Appendix A: Regulatory Setting.

Ventura County Watershed Protection District

Ventura County Watershed Protection District (VCWPD) oversees redline channels, which are channels in Ventura County that convey about 500 cubic feet per second or more in a 100-year runoff event. A list of redline channels that were adopted in 1994 by the Ventura County Watershed Protection District were reviewed (Ventura County 2019). Both Arroyo Conejo and North Fork Arroyo Conejo are included on the list of redline channels. A more detailed regulatory definition of Ventura County jurisdiction can be found in Appendix A.

4.5.1 Protected Trees

The City of Thousand Oaks provides protection to specific trees, in accordance with its local policies and municipal code, including all oaks of the genus *Quercus*, California sycamore (*Platanus racemosa*), and bay laurel, and "landmark" trees of toyon and California walnut. Based on the results of the field survey, coast live oak, California walnut, toyon, and California sycamore are present in the wildlife survey area and on the project site.

Details regarding the locations, measurements, and conditions of the protected trees are provided in the Arborist Report prepared by Rincon in July 2021. The Arborist Report documents 16 protected trees located within the project site boundaries that includes a 25-foot buffer, and describes their species size, condition, and location (Rincon 2021b). Of the 16 trees within this area, 14 are City-protected non-native southern live oaks, one is a scrub oak (*Quercus berberidifolia*), and one is a coast live oak. None of these protected trees are historic or landmark trees.

5 Impact Analysis and Mitigation Measures

5.1 Special Status Species and Nesting Birds

The proposed project would have a significant effect on biological resources if it would:

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

5.1.1 Special Status Plant Species

One special status plant species, California walnut, was found within the rare plant survey area, outside the project site boundaries (Figure 5). Rincon conducted a focused rare plant survey that was timed to coincide with the typical blooming periods of those special-status plants having potential to occur within habitats found in the plant survey area. Based on the habitat type and condition within the survey area, it was determined that four special status plant species have a low potential to occur, none of which were observed during surveys. Direct impacts to California walnut due to injury or mortality to individuals during construction are not anticipated, as they are situated at least 40 feet away from the project site boundaries. Indirect impacts could result from habitat modifications by the introduction of invasive plants from construction equipment. Potential direct and indirect impacts to special status plants would be less than significant through adherence to Measures BIO-1 and BIO-2 as described below.

5.1.2 Special Status Wildlife Species

The proposed project may impact special status wildlife species if they are present on-site during construction, or through habitat modification.

Direct impacts to aquatic species such as arroyo chub would not occur, as ground disturbance will not occur within the water and will be confined to the upper banks and uplands outside of Arroyo Conejo Creek and North Fork Arroyo Conejo Creek. Potentially significant indirect impacts to water quality may occur due to sedimentation or erosion during construction. These potential impacts will be reduced to a less than significant level through adherence to Measures BIO-1 and BIO-2.

Special status wildlife species, including western pond turtle, coast horned lizard, two-striped gartersnake, and San Diego desert woodrat, may be impacted if individuals are present during project initiation or at any time during construction activities. The construction of the proposed project could also result in impacts to woodrat nests if construction activities occur during their nesting season (February 1 – May 31). However, adherence to Measures BIO-1 through BIO-3 would reduce potential direct and indirect effects to these species to a less than significant level.

The arroyo willow thicket community provides suitable habitat for least Bell's vireo. If the species is present within the vicinity of the project during initial vegetation clearance, the proposed project has the potential to impact the species directly (by destroying a nest) or indirectly (removal of habitat, construction noise, dust, and other human disturbances that may cause a nest to fail). Implementation of Measure BIO-4 would ensure that no potential direct and indirect effects to least Bell's vireo occur, and implementation of BIO 1 through BIO-3 will ensure that impacts are avoided

through the duration of construction activities. Impacts to the species would be less than significant with the execution of BIO 1-BIO-4.

The project site contains habitat with the potential to support special status birds, including resident and migrant passerine species and raptors protected under the CFGC and the MBTA. Although no nests were observed, bird nesting habitat is present in the trees and shrubs occurring in and adjacent to the site, and raptors could nest within the taller trees in the area. Therefore, the project could result in direct or indirect impacts to nesting birds. Direct impacts may include mortality from vehicle or equipment strikes as foraging birds move through the project site, and physical impacts to active nests within project site. Indirect impacts could result from noise, vibrations, and dust from construction activities throughout the project site. Noise, vibrations, and dust can cause birds to flush out of cover and become exposed to predators or vehicle strikes. Adults may not return to nests, predators may feed on eggs or chicks in unprotected nests, or vibrations could cause eggs to fall out of nests. Noise, dust, and vibrations may also cause avian species to leave regular foraging areas that are within and adjacent to the project site. If construction activities occur during the nesting season (generally February 1 to August 31), noise, vibrations, and dust can also cause nest failures. Implementation of Measure BIO-5 would ensure that no potential direct and indirect effects occur to nesting birds, and implementation of BIO 1 through BIO-3 would ensure that impacts are avoided through the duration of construction activities. With the successful implementation of Mitigation Measures BIO-1 through BIO-3 and BIO 5, impacts to nesting birds would be less than significant.

Impacts to special status bat species may occur if individuals are roosting within the project site during project activities. Direct project impacts could include the removal of roost trees and mortality or harassment of bats through noise, light, and dust pollution. Indirect impacts could include a degradation of riparian habitat which provides foraging opportunities for special status bat species. These potential direct and indirect impacts would be reduced to a less than significant level through implementation of Mitigation Measures BIO-1, BIO-2, and BIO-6.

Avoidance, Minimization and Mitigation Measures

BIO-1 Worker Environmental Awareness Program

Prior to initiation of all construction activities (including staging and mobilization), all personnel associated with project construction shall attend a Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist, to assist workers in recognizing special status biological resources with the potential to occur in the project site. This training will include information about all special-status species determined to be present or to have a moderate or high potential to occur on-site. Training will also address protected nesting birds, special status plants, sensitive habitats, as well as other special status species potentially occurring in the project site.

The specifics of this program will include identification of special status species and habitats, a description of the regulatory status and general ecological characteristics of special status resources, and review of the limits of construction and measures required to avoid and minimize impacts to biological resources within the project site. A fact sheet conveying this information will also be prepared for distribution to all contractors, their employees, and other personnel involved with construction of the project. All employees will sign a form provided by the trainer documenting they attended the WEAP and understand the information presented. The crew foreman will be responsible for ensuring crew members adhere to the guidelines and restrictions designed to avoid

impacts to special status species. If new construction personnel are added to the project, the crew foreman will ensure the new personnel receive the WEAP training before starting work.

BIO-2 General Best Management Practices

General requirements which shall be followed by construction personnel are listed below.

- No project construction, activities, and equipment staging shall occur within bed and banks of the stream channel. Any work, including operation of loaders, dozers, drilling rigs, cranes, and vehicles, that occurs within 30 feet from the top of stream banks will be minimized to the extent practicable to reduce impacts to special status wildlife species that may occur within the riparian habitat. Only work that is required to occur within this buffer (e.g., installation of bridge supports) may be performed. Vehicles and workers shall not be allowed to enter or cross the stream channel to move between the east and west side of the project site. Fencing and signage shall be installed 30 feet from the stream banks to exclude entry into the stream channel for the duration of the project. Fencing and signage shall not be moved, except to facilitate work that is required to occur within 30 feet of the stream banks, and must be maintained for the duration of the project. The contractor shall advise all workers of the intent of the protection measures prior to the start of project construction and activities. No living native vegetation shall be removed from the channel, bed, or banks of the Arroyo Conejo.
- Project-related vehicles shall observe a 5-mile-per-hour speed limit within the unpaved limits of construction
- All open trenches shall be fenced and sloped to prevent entrapment of wildlife species.
- All hollow posts and pipes shall be capped, and metal fence stakes shall be plugged with bolts or other plugging materials to prevent wildlife entrapment and mortality.
- All food-related trash items such as wrappers, cans, bottles, and food scraps generated during proposed project construction shall be disposed of in closed containers only and removed daily from the project site.
- No deliberate feeding of wildlife shall be allowed.
- No pets shall be allowed on the project site.
- No firearms shall be allowed on the project site.
- If vehicle or equipment maintenance is necessary, it shall be performed in the designated staging areas.
- During construction, heavy equipment shall be operated in accordance with standard Best Management Practices (BMPs). All equipment used on-site shall be properly maintained to avoid leaks of oil, fuel, or residues. The contractor shall prevent oil, petroleum products, or any other pollutants from contaminating the soil or entering a watercourse (dry or otherwise). When vehicles or equipment are stationary, mats or drip pans shall be placed below vehicles to contain fluid leaks. Provisions shall be in place to remediate any accidental spills.
- Materials shall be stored on impervious surfaces or plastic ground covers to prevent any spills or leakage and shall be at least 50 feet from drainage features. Construction materials and spoils shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- While encounters with special status species are not likely or anticipated, any worker who inadvertently injures or kills a special status species or finds one dead, injured, or entrapped shall immediately report the incident to the construction foreman or biological monitor. The construction foreman or biological monitor shall immediately notify the City. The City shall

follow up with written notification to USFWS and/or CDFW within five working days of the incident. All observations of federally listed species shall be recorded on CNDDB field sheets and sent to CDFW by the City or the biological monitor.

- Refueling of any equipment shall only occur in designated potentially areas. On the west side of the stream, refueling areas shall only occur on the dirt road. On the east side of the stream, refueling shall only occur in the disturbed area by Hill Canyon Road. Designated areas shall not be located near any storm drain inlets, drainage swales, or surface waterways. When refueling gas powered equipment or mixing herbicide, workers shall refuel or mix over an appropriately-sized drip pan to catch any spillage. The designated refueling area shall be inspected frequently to ensure no spill of hazardous materials have occurred and could contaminate the ground or water. The Contractor shall advise workers to clean and report spills immediately.
- Grubbing and grading shall be conducted in a manner to avoid islands of habitat where wildlife may take refuge and later be killed by heavy equipment. Grubbing and grading shall be done from the center of the project site, working outward towards adjacent habitat off site where wildlife may safely escape.
- Before starting or moving construction vehicles, especially after a few days of nonoperation, operators shall inspect under all vehicles to avoid impacts to any wildlife that may have sought refuge under equipment. All large building materials and pieces (e.g., sections of the bridge) with crevices where wildlife can potentially hide shall be inspected before moving. If wildlife is detected, a qualified biologist shall move wildlife out of harm's way or temporarily stop activities until the animal leaves the area.
- After the conclusion of the project, COSCA and the City shall install appropriate public information signage on both sides of the stream to: 1) educate and inform the public about wildlife present in the area; 2) advise on proper avoidance measures to reduce human-wildlife conflicts; 3) advise on proper use of open space trails in a manner respectful to wildlife; and, 4) provide local contact information to report injured or dead wildlife. Signage shall be written in the language(s) understandable to all those likely to recreate and use the trails. Signage shall not be made of materials harmful to wildlife such as spikes or glass. COSCA and the City shall provide a long-term maintenance plan to repair and replace the signs.

BIO-3 Preconstruction Terrestrial Wildlife Surveys and Biological Monitoring

A CDFW-approved qualified biologist familiar with special status plant and wildlife species with potential to occur in the project site shall conduct preconstruction surveys for two-striped garter snake, western pond turtle, coastal whiptail, coast horned lizard, and San Diego desert woodrats. The biologist will be on site immediately prior to and during ground and habitat disturbing activities to move special status species or other wildlife of low mobility out of harm's way that could be injured or killed. Collected wildlife shall be removed and placed onto adjacent and suitable species-specific habitat in the vicinity that is out of harm's way. A qualified biological monitor shall have the authority to halt construction to prevent or avoid take of any special status species and/or to maintain compliance with all avoidance, minimization, and mitigation measures (i.e., BIO-1 through BIO-6). The biologist will recommend measures to maintain compliance with all avoidance and minimization measures, applicable permit conditions, and any conditions required by the City. When the biological monitor is present on-site, they will be responsible for:

- Ensuring procedures for verifying compliance with environmental mitigation are followed
- Lines of communication and reporting methods
- Daily and weekly reporting of compliance

- Construction crew WEAP training
- Authority to stop work
- Action to be taken in the event of non-compliance

If the CDFW-approved biologist finds active woodrat nests (middens) during the peak nesting season (February 1 through May 31), the Permittee shall implement a 50-foot radius buffer area around the nests in which land clearing activities will be postponed until the end of peak nesting season. If the biologist finds active woodrat nests outside of the peak nesting season, a CDFW-approved biologist may wish to relocate the nest(s) if there is concern that individual woodrats may be impacted by construction activities. If the biologist determined that a woodrat nest should be relocated, the following methods shall be implemented:

- Create new habitat on adjacent areas not impacted by the project by providing a vertical structure using local native material, such as tree and shrub trimmings, stacked horizontally in areas that are under shady canopies and upslope of seasonal drainages. Piling rocks removed from the construction area can also be used to help achieve a structure. If multiple nesting material structures are created, they shall be a minimum of 25 feet apart. The CDFW-approved biologist shall place the new nesting material under shady areas in order to increase the chance that woodrats will use the nests. These areas shall be in locations that do not presently provide this habitat structure to create new nesting opportunity and to reduce potential competition with existing woodrats.
- After creation of habitat outside of the construction footprint, vegetation clearance around the nest shall be conducted to reduce woodrat dispersal back into the project site.
- Nudge the nest with an excavator bucket to flush the woodrats from the nest. They will usually abandon the nest and run out into adjacent cover.
- Carefully and slowly pick up the nest material with the excavator bucket (to allow any additional woodrats to escape), while maintaining a safe distance from the nest to reduce health hazards to the workers. Dust masks shall be used even when operating equipment.
- Move the nest material to the creation area and place the nest material adjacent to the created nesting structure.

BIO-4 Least Bell's Vireo Preconstruction Surveys

Prior to initiation of project construction and activities within or adjacent to suitable nesting habitat during least Bell's vireo breeding season (March 15 - September 15), a CDFW-approved biologist with experience surveying for least Bell's vireo shall conduct at least three focused surveys following USFWS established protocols to determine whether breeding least Bell's vireos are present. If least Bell's vireo is present, the biologist shall determine its breeding territory, and no construction shall take place from March 15 through September 15.

BIO-5 Nesting Birds

Project-related activities shall occur outside of the bird breeding season (generally February 1 to August 31) to the extent practicable. If construction must occur within the bird breeding season, then no more than three days prior to initiation of ground-disturbing activities (including, but not limited to site preparation, grading, excavation, and trenching) within the project site, a nesting bird pre-construction survey shall be conducted by a qualified biologist within the disturbance footprint plus a 100-foot buffer (300-foot for raptors), where feasible. If the proposed project is phased or

construction activities stop for more than one week, a subsequent pre-construction nesting bird survey will be required within three days prior to each phase of construction.

Pre-construction nesting bird surveys shall be conducted during the time of day when birds are active and shall factor in sufficient time to perform this survey adequately and completely. A report of the nesting bird survey results, if applicable, shall be submitted to COSCA for review and approval prior to ground and/or vegetation disturbance activities.

If nests are found, an appropriate avoidance buffer ranging in size from 25 to 50 feet for passerines, and up to 300 feet for raptors depending upon the species and the proposed work activity, shall be determined and demarcated by a qualified biologist with bright orange construction fencing or other suitable material. Active nests shall be monitored at a minimum of once per week until it has been determined that the young have fledged the nest. No ground disturbance or vegetation removal shall occur within this buffer until the qualified biologist confirms that breeding/nesting has ended, and all the young have fledged. If no nesting birds are observed during pre-construction surveys, no further actions would be necessary.

BIO-6 Bat Surveys and Protection

The presence or absence of any bat roosts shall be confirmed prior to the initiation of project activities. A qualified bat specialist shall conduct bat surveys within the project site and within a 500-foot buffer to identify potential habitat that could provide daytime and/or nighttime roost sites, and any maternity roosts. Acoustic recognition technology shall be used to maximize detection of bats. Night roosts are typically utilized from the approach of sunset until sunrise. Maternity colonies, composed of adult females and their young, typically occur from spring through fall.

If bats are not detected, but the bat specialist determines that roosting bats may be present at any time of year and could roost in trees, trees planned for removal shall be pushed down using heavy machinery rather than felling it with a chainsaw. To optimize the warning for any roosting bats that may still be present, trees shall be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree shall be initially pushed slowly so as to allow roosting bats to escape. After a suitable bat roosting tree is felled, it shall remain in place until it is inspected by a bat specialist. Trees that are confirmed to be bat roosts shall not be bucked or mulched immediately, instead, a period of at least 24 hours, and preferably 48 hours, shall elapse prior to such operations to allow bats to escape.

If maternity roosts are found, to the extent feasible, work shall be scheduled between October 1 and February 28, outside of the maternity roosting season when young bats are present but are not yet ready to fly out of the roost (March 1 to September 30).

If maternity roosts are found and trees must be removed during the maternity season, a qualified bat specialist shall conduct a preconstruction survey to identify those trees proposed for disturbance that could provide hibernacula or nursery colony roosting habitat. Acoustic recognition technology shall be used to maximize detection of bats. Each tree identified as potentially supporting an active maternity roost shall be closely inspected by the bat specialist no more than seven days prior to tree disturbance to determine the presence or absence of roosting bats more precisely. If maternity roosts are detected, trees determined to be maternity roosts shall be left in place until the end of the maternity season. Work shall not occur within 100 feet of an active roost and construction shall not occur between 30 minutes before sunset and 30 minutes after sunrise.

5.2 Sensitive Plant Communities

The proposed project would have a significant effect on biological resources if it would:

b) Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

CDFW defines ashy buckwheat scrub and California walnut groves as sensitive natural communities. Construction activities are not expected to directly impact to these communities. However, indirect impacts from construction such as erosion, runoff, dust from excavation and construction equipment could result in potentially significant indirect impacts to these sensitive communities. Potential impacts associated with runoff would be minimized through implementation of appropriate BMPs, including, but not limited to: straw wattles, silt fencing, and plastic covers for soil spoils. Implementation of Mitigation Measures BIO-1 and BIO-2 would further reduce potential indirect impacts to sensitive habitats to a less than significant level.

In addition, construction activities could introduce non-native invasive plants or pathogens to the site via contaminated equipment and supplies. Soil disturbance due to project activities could also encourage the growth and spread of non-native plant species currently in the seedbank. The project may result in the spread of pathogens if potentially diseased trees are removed and transported off-site. This could negatively impact native vegetation on and downstream of the project site and degrade habitats that sensitive wildlife species depend upon, a potentially significant impact. Implementation of Measure BIO-7 would reduce these potential impacts to less than significant by protecting the surrounding native habitats against spread of non-native seeds and pathogens.

Avoidance, Minimization and Mitigation Measures

BIO-7 Protection Against Spread of Non-Native Seeds and Pathogens

Prior to entering the project site, workers shall inspect their clothing, including shoes, all vehicles, and equipment for invasive plant seeds or plant parts. The undercarriage and tires of loaders, dozers, drilling rigs, cranes, and vehicles, power tools, and other equipment, shall be power washed and clean from any seeds, pathogens, and mud before entering the project site for the first time. All soil and fill material shall be inspected and determined free of any invasive plant seed prior to leaving the facility where the material is coming from. Any straw, wood, or other mulch shall be purchased from a certified weed-free vendor.

Excavated soil containing non-native plants shall be stored in a previously disturbed area or staging area at least 50 feet from potential jurisdictional features. Any soil contaminated by non-native species will be placed at the bottom of the trench or spoils pile to reduce the spread of non-native species.

Removed trees will not be removed from the site to reduce the potential for spread of infectious pathogens. Trees will be left on site and will be chipped for use as ground cover, mulched, or placed to provide upland habitat structure. No tree material shall be placed in the stream channel unless the City coordinates with CDFW and determines woody material would create suitable habitat structure for aquatic reptiles and fish. Pruning and power tools will be cleaned and disinfected before use on site to prevent introducing pathogens, and after use to prevent spread of pathogens to new areas.

5.3 Jurisdictional Waters and Wetlands

The proposed project would have a significant effect on biological resources if it would:

c) 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.

Direct impacts may occur to Arroyo Conejo due to bridge installation and construction staging. Excavation and construction activities were designed to be confined to the upper banks of Arroyo Conejo, outside the 100-year peak flow elevation. Accordingly, impacts to the bed and banks of Arroyo Conejo will be avoided. Table 2 shows the extent of proposed impacts within resource agency jurisdiction. Table 2 shows the extent of proposed temporary and permanent impacts to vegetation communities within resource agency jurisdiction.

Table 2 Anticipated Impacts to Potentially Jurisdictional Areas

	USACE		CDFW	RWQCB	
Impact Type	Non-Wetland Waters of the U.S. (acres [lin. ft.])	Wetland Waters of the U.S. (acres [lin.ft.])	CDFW Jurisdictional Streambed (acres [lin. ft.])	Non-wetland Waters of the State (acres [lin. ft.])	Wetland Waters of the State (acres [lin. ft.])
Temporary	0 (0)	0 (0)	0.074 (90)	0 (0)	0 (0)
Permanent	0 (0)	0 (0)	0.362 (100)	0 (0)	0 (0)

Table 3 Anticipated Impacts to Vegetation Communities within Resource Agency Jurisdiction

Impact Type	Arroyo Willow – Mulefat Thickets (acres)	Mulefat Thickets (acres)	Red Brome Grasslands (acres)	Upland Mustards (acres)	Total (acres)
Temporary	0.002	0.004	0.009	0.059	0.074
Permanent	0.003	0.032	0.200	0.127	0.362

If the project occurs during the rainy season, Arroyo Conejo and North Fork Arroyo Conejo may be impacted by means of indirect effects (e.g., increased turbidity, altered pH, decreased dissolved oxygen levels, etc.) after a rain event. In addition, 0.035 acre of riparian vegetation is expected to be permanently lost as a result of the project. Indirect impacts to the jurisdictional features could occur as the addition of new paved surfaces as a result of the project would reduce natural groundwater infiltration and potentially increase surface flow into Arroyo Conejo, though these impacts are anticipated to be negligible due to the small size of the project.

In addition, if groundwater is encountered during excavation, dewatering may be necessary. This could lower the water table in the project site and potentially result in increased drought stress on nearby vegetation. Moreover, this could cause a decline in the health of riparian and upland vegetation adjacent to the project site. Adherence to Measures BIO-2, BIO-8, and BIO-9 (and adherence to agency permits and existing regulations) would reduce potential direct and indirect impacts to jurisdictional waters and wetlands to a less than significant level.

Avoidance, Minimization and Mitigation Measures

BIO-8 Compensatory Mitigation

COSCA and the City shall retain a qualified biologist and restoration specialist to create a Restoration Plan. This plan will mitigate for impacts to existing habitat, including arroyo willow – mulefat thickets, disturbed ornamental woodland, and the removal of protected trees (including City-protected coast live oak and southern live oak trees). This plan will be submitted for review and approval by CDFW. Because the riparian habitat impacted by project activities provides suitable habitat for least Bell's vireo, this plan will include the components necessary for a Least Bell's Vireo Habitat Restoration Plan. Elements of the plan shall include (but are not limited to) methods, timing, monitoring, and reporting procedures.

Compensatory mitigation for temporary and permanent impacts to arroyo willow and mule fat scrub restoration is required. For these riparian communities, a minimum 3:1 and 5:1 mitigation ratio shall be used for temporary and permanent impacts, respectively. For 0.006 acre of temporary impacts and 0.035 acre of permanent impacts to arroyo willow thickets and mulefat thickets subject to CDFW jurisdiction, 0.018 acre and 0.175 acre shall be restored, respectively, for a total of 0.193 acre. Restoration shall be in kind and shall use an appropriate combination of mulefat cuttings and willow stakes. Arroyo willow restoration shall follow a Least Bell's Vireo Habitat Restoration Plan.

Compensatory mitigation for 0.068 acre of temporary impacts and 0.327 acre of permanent impacts to red brome grasslands and upland mustards within CDFW jurisdiction is also required. As these areas do not contain riparian vegetation and are relatively disturbed, temporary and permanent impacts will be mitigated at a 1:1 ratio. Accordingly, 0.395 acre of compensatory mitigation is required for impacts to red brome grasslands and upland mustards. Habitat restoration for permanently impacted red brome grasslands and upland mustards shall occur within the 1.06-acre area classified as ornamental woodland. Temporarily impacted red brome grasslands and upland mustards shall be restored in place. Off-site restoration areas, including the coast live oak tree installation, shall be approved by COSCA and included in the Restoration Plan. Restoration activities shall consist of hydroseeding the native seed mix shown below in Table 4 below. Species native to the region that are characteristic of the local riparian habitat types found on-site but not included on the plant and seed palette may also be used as substitutes, as described in the mitigation plan.

Table 4 Restoration Seed Mix

Scientific Name	Common Name
Acmispon glaber	deerweed
Artemisia californica	California sagebrush
Bromus carinatus	California brome
Encelia californica	California sunflower
Eriogonum cinereum	ashy buckwheat
Eschscholzia californica	California poppy
Festuca microstachys	small fescue
Lupinus succulentus	arroyo lupine
Plantago insularis	plantain
Salvia leucophylla	purple sage

In addition, the following container plants will be installed:

- Twenty (20) coast live oak trees;
- Twenty (20) blue elderberry seedlings;
- Forty (40) mulefat cuttings; and
- Twelve (12) California walnut seedlings.

5.4 Wildlife Movement

The proposed project would have a significant effect on biological resources if it would:

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.

The project occurs within the Arroyo Conejo wildlife corridor recognized in the City of Thousand Oaks General Plan (City of Thousand Oaks 2013). Wildlife are expected to utilize the riparian corridors associated with Arroyo Conejo and North Fork Arroyo Conejo, and the adjacent upland habitats. Wildlife movement may be temporarily disrupted due to construction activities (e.g., noise, light, dust, human presence). Wildlife present in the project site during construction may become entrapped or crushed.

No alterations will be made in the creek channels and once constructed, the bridge and access path are not expected to impede wildlife movement. However, the operation of the project may lead to increased recreation and human presence in the area that may negatively impact wildlife movement in the area for species active in daylight hours. Implementation of Measures BIO-1 through BIO-6 and BIO-9 will reduce potential impacts to wildlife movement to a less than significant than significant level.

Avoidance, Minimization and Mitigation Measures

BIO-9 Protection Against Impacts to Wildlife Movement

- Work shall be limited to daylight hours and shall not occur 30 minutes before sunset and 30 minutes after sunrise. The project will avoid non-essential lighting and artificial lighting. Any artificial lighting shall be of the lowest illumination, be selectively placed, and shielded and directed downward to minimize light spillage into the adjacent natural habitats.

5.5 Local Policies and Ordinances

The proposed project would have a significant effect on biological resources if it would:

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance

Coast live oak, southern live oak, scrub oak, California sycamore, and California walnut trees protected by the City occur in the wildlife survey area. According to the 2021 Arborist Report, 16 oak trees (14 southern live oak, one coast live oak, and one scrub oak) protected by the City are located within 25 feet of the project site boundaries. Of these, one coast live oak and seven southern live oaks would be removed as a result of the project. The roots of three southern live oaks

may be encroached up to 15 percent by the grading footprint. One scrub oak may be encroached up to 5 percent by the bridge span. Other protected trees may potentially be indirectly impacted by the project due to soil compaction by heavy equipment and accidental spills of hazardous material, such as hydraulic fluid from heavy equipment. These potential direct and indirect impacts would be significant.

Necessary permits and authorizations from the City for the removal and trimming of trees within the project footprint would be necessary prior to Project construction activities. Through adherence to Mitigation Measures BIO-10 and BIO-11, the project would maintain compliance with the City's tree protection policies and ordinances, and potential impacts to protected trees would be reduced to a less than significant level.

The Conservation Element of the City's General Plan contains objectives and policies for biological resources that are relevant to the proposed project given its location and/or proposed activities. As identified above, these objectives and policies focus on conservation of existing natural areas; restoration of damaged natural vegetation; protection of wetlands, oak trees and other indigenous woodlands, and endangered or threatened species and habitat; consideration of wildlife habitat resources including wildlife corridors; protection and preservation of cultural resources; and recreational trail access.

The project would comply with the objectives and policies of the City's General Plan through implementation of Measures BIO-1 through BIO-11. Accordingly, no impacts would occur.

BIO-10 Minimize Impacts to Protected Trees

The project shall comply with the requirements of the City's Oak Tree Preservation and Protection Guidelines (Res. 2010-14) and Landmark Tree Ordinance (No. 1217-NS). These include but may not be limited to:

- Preserve protected trees on site whenever possible and avoid pruning branches or roots of protected trees.
- The tree protection zone (TPZ) will be defined as five feet beyond the natural dripline of the tree, or 15 feet from the trunk, whichever is greater.
- Tree protection shall be established at the TPZ or at the greatest distance possible from all trees not planned for removal.
- The limits of the TPZ shall be staked in the field prior to commencement of construction activities.
- Any brush clearing or pruning required within the TPZ of trees not planned for removal shall be accomplished with hand tools.
- All trimming, pruning or removal of trees shall be conducted or directly supervised by an International Society of Arboriculture (ISA) Certified Arborist or Tree Worker. Pruning shall be conducted in accordance with current ANSI A300 Standards.
- No materials, equipment, spoil, waste or washout water may be deposited, stored or parked within the TPZ.
- If equipment placement within the TPZ is necessary for construction activities, ground protection shall be placed to prevent soil compaction, consisting of two inches of mulch placed underneath plywood.

- Any roots over one inch in diameter exposed during construction activities shall be exposed to sound tissue and cut cleanly with a saw. No pruning of limbs or roots two inches or greater in diameter shall occur without an approved tree permit from the City. No more than 20 percent of live foliage or ground disturbance within the TPZ of a protected tree should occur. Pruning or ground impacts exceeding 20 percent of the tree canopy or TPZ, respectively, shall be pre-approved by the City.

BIO-11 Oak Tree Replacement

Removed trees will be replaced at a 4:1 ratio, in accordance with the City's tree protection policies and ordinances. For impacts to one coast live oak tree and seven southern live oak trees, 32 coast live oak trees will be planted that include 20 trees planted on-site and 12 trees planted at a City-approved off-site location. Coast live oak trees installed on-site will compensate for impacts to one coast live oak tree and four southern live oak trees, while coast live oak trees planted off-site will compensate for impacts to the remaining three southern live oak trees. Locations and details of offsite planting areas will be provided in the Restoration Plan described in Mitigation Measure BIO-8. The precise location of trees to be installed on-site will be determined by a qualified restoration specialist and will take into account existing groundcover species, level of soil disturbance, and other factors that may influence tree growth. If considered necessary by the restoration specialist, soil may be decompacted by the use of hand tools to encourage root growth.

Oak tree mitigation shall also include restoration of appropriate ground cover, subshrub, or shrub understory species. Ground cover installed around the trees will consist primarily of native herbaceous, shrub, and subshrub species currently present in upland portions of the impacted areas. Species native to the region that are characteristic of the local woodland habitat types found on-site may also be used.

Additional details regarding the oak tree mitigation and oak woodland habitat restoration areas will be addressed in the Restoration Plan described in Mitigation Measure BIO-8.

5.6 Adopted or Approved Plans

The proposed project would have a significant effect on biological resources if it would:

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan.

The project would comply with the goals and objectives of the Conejo Canyons Open Space Management Plan through implementation of Measures BIO-1 through BIO-11. Accordingly, no impacts would occur.

6 Limitations, Assumptions, and Use Reliance

This Biological Resources Assessment has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the project site. In particular, mobile wildlife species could occupy the project site on a transient basis or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from project site reconnaissance, jurisdictional areas, review of CNDDB RareFind5, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

7 References

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Appendix A

Regulatory Guidance

Regulatory Guidance

Special status habitats are vegetation types, associations, or sub-associations that support concentrations of special status plant or animal species, are of relatively limited distribution, or are of particular value to wildlife.

Listed species are those taxa that are formally listed as endangered or threatened by the federal government (e.g., U.S. Fish and Wildlife Service [USFWS]), pursuant to the Federal Endangered Species Act (FESA) or as endangered, threatened, or rare (for plants only) by the State of California (i.e., California Fish and Game Commission), pursuant to the California Endangered Species Act or the California Native Plant Protection Act. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g., Audubon Society, CNPS, The Wildlife Society), and the scientific community.

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States);
- Regional Water Quality Control Board (waters of the State);
- U.S. Fish and Wildlife Service (federally listed species and migratory birds);
- California Department Fish and Wildlife (riparian areas and other waters of the State, state-listed species, Species of Special Concern);
- The City of Thousand Oaks General Plan;
- City of Thousand Oaks Tree Preservation and Protection Ordinance (Article 42) §1, 937-NS as amended by §3, 1534-NS and Part 3 of 1610-NS; and
- City of Thousand Oaks Landmark Tree Preservation and Protection Ordinance (Articles 43) §2, 1217-NS as amended by Part 4 of 1610-NS.

U.S. Army Corps of Engineers

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has authority to regulate activities that could discharge fill of material or otherwise adversely modify wetlands or other “waters of the United States.” Perennial and intermittent creeks are considered waters of the United States if they are hydrologically connected to other jurisdictional waters. The USACE also implements the federal policy embodied in Executive Order 11990, which is intended to result in no net loss of wetland value or acres. In achieving the goals of the Clean Water Act, the USACE seeks to avoid adverse impacts and offset unavoidable adverse impacts on existing aquatic resources. Any fill or adverse modification of wetlands that are hydrologically connected to jurisdictional waters would require a permit from the USACE prior to the start of work. Typically, when a project involves impacts to waters of the United States, the goal of no net loss of wetland acres or values is met through compensatory mitigation involving creation or enhancement of similar habitats.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and the local Regional Water Quality Control Board (RWQCB) have jurisdiction over "waters of the State," pursuant to the Porter-Cologne Water Quality Control Act, which are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. The SWRCB has issued general Waste Discharge Requirements (WDRs) regarding discharges to "isolated" waters of the State (Water Quality Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction). The RWQCB enforces actions under this general order for isolated waters not subject to federal jurisdiction, and is also responsible for the issuance of water quality certifications pursuant to Section 401 of the Clean Water Act for waters subject to federal jurisdiction.

United States Fish and Wildlife Service

The USFWS implements the Migratory Bird Treaty Act (16 United States Code [USC] Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the Federal Endangered Species Act (FESA) (16 USC § 153 et seq.). Generally, the USFWS implements the FESA for terrestrial and freshwater species, while the NMFS implements the FESA for marine and anadromous species. Projects that would result in "take" of any federally threatened or endangered species are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of FESA, depending on the involvement by the federal government in permitting and/or funding of the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of FESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California. The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened, endangered or fully protected species. Take under CESA is restricted to direct mortality of a listed species and does not prohibit indirect harm by way of habitat modification. The CDFW also prohibits take for species designated as Fully Protected under the Code.

California Fish and Game Code sections 3503, 3503.5, and 3511 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Fully protected birds (Section 3511) may not be taken or possessed except under specific permit. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs.

Species of Special Concern (SSC) is a category used by the CDFW for those species which are considered to be indicators of regional habitat changes or are considered to be potential future protected species. Species of Special Concern do not have any special legal status except that which may be afforded by the Fish and Game Code as noted above. The SSC category is intended by the CDFW for use as a management tool to include these species in special consideration when

decisions are made concerning the development of natural lands. The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Under Section 1913(c) of the NPPA, the owner of land where a rare or endangered native plant is growing is required to notify the department at least 10 days in advance of changing the land use to allow for salvage of plant.

Perennial and intermittent streams and associated riparian vegetation, when present, also fall under the jurisdiction of the CDFW. Section 1600 *et seq*. of the Fish and Game Code (Lake and Streambed Alteration Agreements) gives the CDFW regulatory authority over work within the stream zone (which could extend to the 100-year flood plain) consisting of, but not limited to, the diversion or obstruction of the natural flow or changes in the channel, bed, or bank of any river, stream or lake.

Local Jurisdiction

As noted in Section 4.6 of this BRA, the Conservation Element of the Thousand Oaks General Plan provides guidance and "implied constraints with respect to human activities that affect" important local resources such as native plant communities, wildlife resources, Wildlife Movement Corridors, Oak and Landmark Trees, Wetland and Riparian Areas, and Rare, Threatened, and Endangered Species (City of Thousand Oaks 2013). To achieve this, the general plan also identifies specific polices for the protection of biological (and other) resources. The following are local policies that may be considered as part of the proposed project review:

- **CO-15:** Every effort shall be made to design and construct stormwater retention and debris basins to minimize any potentially adverse impacts to significant landform features, aquatic resources, and associated native plant and animal communities.
- **CO-23:** Critical wildlife habitat resources such as movement corridors, surface water impoundments, streams and springs should be given special consideration for protection, restoration or enhancement, in order to maintain biodiversity, biological productivity and ecological integrity of natural open space areas.
- **CO-27:** Since natural stream drainages often serve as important movement corridors for wildlife, they should be preserved wherever it is feasible to do so.
- **CO-28:** Urban land uses adjoining natural open space areas should be designed in a manner that is sensitive to the needs of wildlife and avoids or minimizes any potentially adverse impacts to movement corridors.
- **CO-29:** Continue to protect oak and landmark trees and their habitat in recognition of their historic, aesthetic and environmental value to the citizens of Thousand Oaks, in particular Valley Oak habitat.
- **CO-30:** Preserve wetlands and associated wetland buffers as open space and maintain these areas in a natural state to protect the community's water quality, biodiversity and aesthetic value.
- **CO-32:** The City shall encourage and promote the conservation and protection of all rare, threatened, endangered or sensitive species listed by State and Federal agencies (United States Fish and Wildlife Service and California Department of Fish and Wildlife), the California Native Plant Society (CNPS), the County of Ventura and the City of Thousand Oaks.

Other policies may also be considered as part of the project review.

As an extension of policy CO-29, the City of Thousand Oaks also has ordinances in place to guide their care, pruning, preservation and removal of certain oak and landmark trees. These ordinances are designed to protect all oaks (*Quercus* sp.) greater than two inches in diameter, "larger-sized" California sycamores, California walnut (*Juglans californica*), bay laurel (*Umbellularia californica*), and toyon (*Heteromeles arbutifolia*) trees. Specifically, the ordinances are:

- Oak Tree Preservation and Protection Standards (Municipal Code Sec. 9-4.4200 et. seq)
- Oak Tree Preservation and Protection Guidelines (Res. 2010-14)
- Landmark Tree Ordinance No. 1217-NS

Locally Protected Trees

As noted above, oak trees (of the genus *Quercus*) within the City are protected and a permit is required for cutting, damaging, encroaching into the protected zone, or relocating/removing an oak tree. The protected zone is defined as a specific area extending outward from the trunk of the tree five feet beyond the natural dripline. In no case shall the protected zone trace a circumference less than 15 feet from the trunk of the tree.

Also as noted above, the City provides protection of other trees in accordance with the same part of the municipal code, including landmark trees which have reached the designated maturity as measured at 4.5 feet above natural grade for the following species: toyon which exceed 8 inches in diameter; California walnut which exceed 8 inches in diameter; California sycamore which exceed 12 inches in diameter; and California bay laurel which exceed 8 inches in diameter. Trees with multiple trunks shall be deemed to have reached maturity if the sum of the diameters of the multiple trunks exceeds the required diameter plus two inches of a single trunk tree. Landmark trees shall also include all designated historic trees. Likewise, landmark trees shall also include any tree, of any type, designated as landmark trees by the Planning Commission or City Council during review of any land use entitlement request and which trees are required to be preserved as a condition of that City approved entitlement, land division, or tract map. This designation shall continue whether or not the use for which the entitlement is issued is inaugurated or the land division or tract map is recorded.

Ventura County Watershed Protection District

Ventura County Watershed Protection District (VCWPD), which implements the Flood Plain Management Ordinance 3841 on behalf of Ventura County ensures compliance with the National Flood Insurance Program. This includes review of structures built in the floodplain affecting the bed, banks and overflow areas of VCWPD jurisdictional redline channels. The list of redline channels was adopted by the District Board of Supervisors in 1960, and then updated and confirmed by them in 1994. Ventura County defines a redline channel as follows:

- Most of the redline channels convey about 500 cubic feet per second or more in a 100-year runoff event.

Appendix B

Site Photographs

Photograph 1. Ornamental woodland composed of planted and irrigated southern live oak trees west of Hill Canyon Road. Photograph taken 4/23/21, facing northwest.

Photograph 2. View of vegetation communities on east side of Hill Canyon Road with upland mustards in the foreground, California walnut groves in the midground, and ashy buckwheat scrub in the background. Photograph taken 4/23/21, facing north.

Photograph 3. View of upland mustards, purple sage scrub, and dirt hiking trail on east side of Hill Canyon Road. Photograph taken 4/23/21, facing northeast.

Photograph 4. Mulefat thickets in red brome grassland, inside project site boundaries. Photograph taken 4/23/21, facing southeast.

Photograph 5. California walnut groves showing trees regrowing after fire and a dense herbaceous layer. Photograph taken 4/23/21, facing northwest.

Photograph 6. Arroyo willow - mulefat thickets associated with Arroyo Conejo. Photograph taken 4/23/21, facing southeast.

Photograph 7. Unpaved trail crossing at Arroyo Conejo. Photograph taken 4/23/21, facing west.

Photograph 8. Vegetated sandbar in Arroyo Conejo, patch of of giant reed visible in arroyo willow – mulefat thickets. Photograph taken 4/23/21, facing southeast.

Photograph 9. Coyote brush scrub with a dense herbaceous layer of mustards. Photograph taken 4/23/21, facing northwest.

Photograph 10. Bigpod ceanothus chaparral, upland mustards, and unpaved trail west of Arroyo Conejo. Photograph taken 4/30/21, facing southwest.

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Appendix C

Floral and Faunal Compendium

Plant Species Observed Within the Rare Plant Survey Area on April 23 and April 30, 2021

Scientific Name	Common Name	Status	Native or Introduced
Plants			
Trees			
Callistemon citrinus	crimson bottlebrush		Introduced
Fraxinus sp.	–		–
Juglans californica	California walnut	CRPR 4.2, CTO	Native
Platanus racemosa	California sycamore	CTO	Native
Populus fremontii	Fremont cottonwood		Native
Quercus agrifolia	coast live oak	CTO	Native
Quercus virginiana	southern live oak	CTO	Introduced
Salix exigua	sandbar willow		Native
Salix lasiolepis	arroyo willow		Native
Sambucus nigra ssp. *caerulea*	blue elderberry		Native
Washingtonia robusta	Mexican fan palm		Introduced; Cal-IPC Moderate
Shrubs			
Artemisia californica	California sagebrush		Native
Baccharis pilularis	coyotebrush		Native
Baccharis salicifolia	mulefat		Native
Ceanothus megacarpus var. *megacarpus*	bigpod ceanothus		Native
Encelia californica	California bush sunflower		Native
Eriodictyon crassifolium	thick leaved yerba santa		Native
Eriogonum cinereum	coastal buckwheat		Native
Eriogonum fasciculatum	California buckwheat		Native
Hesperoyucca whipplei	chaparral yucca		Native
Heteromeles arbutifolia	toyon		Native
Malacothamnus fascicularis	chaparral mallow		Native
Malosma laurina	laural sumac		Native
Nicotiana glauca	tree tobacco		Introduced; Cal-IPC Moderate
Opuntia sp.	–		–
Prunus ilicifolia ssp. *ilicifolia*	holly leaf cherry		Native
Rhus integrifolia	lemonade berry		Native
Rhus ovata	sugarbush		Native
Rosa californica	California wild rose		Native
Salvia leucophylla	purple sage		Native
Salvia mellifera	black sage		Native

Scientific Name	Common Name	Status	Native or Introduced
Herbs			
Acmispon glaber	deerweed		Native
Ambrosia psilostachya	ragweed		Native
Apium graveolens	garden celery		Introduced
Artemisia douglasiana	mugwort		Native
Atriplex semibaccata	Australian saltbush		Introduced; Cal-IPC Moderate
Azolla filiculoides	mosquito fern		Native
Brassica nigra	black mustard		Introduced; Cal-IPC Moderate
Calystegia macrostegia	island morning glory		Native
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle		Introduced
Chenopodium californicum	California goosefoot		Native
Clarkia purpurea	pruple clarkia		Native
Conium maculatum	poison hemlock		Introduced; Cal-IPC Moderate
Cyperus involucratus	umbrella plant		Native
Datura wrightii	Jimsonweed		Native
Dudleya pulverulenta	chalk dudleya		Native
Eriogonum elongatum var. *elongatum*	longstem buckwheat		Native
Euphorbia terracina	Geraldton carnation weed		Introduced; Cal-IPC Moderate
Foeniculum vulgare	fennel		Introduced; Cal-IPC Moderate
Galium aparine	common bedstraw		Native
Hirschfeldia incana	summer mustard		Introduced; Cal-IPC Moderate
Malacothrix saxatilis	cliff aster		Native
Malva parviflora	cheeseweed mallow		Introduced
Marrubium vulgare	white horehound		Introduced; Cal-IPC Limited
Nasturtium officinale	watercress		Native
Phacelia sp.	–		Native
Ricinus communis	castor bean		Introduced; Cal-IPC Limited
Salsola tragus	Russian thistle		Introduced; Cal-IPC Limited
Sisymbrium irio	London rocket		Introduced; Cal-IPC Moderate
Solanum douglasii	Douglas' nightshade		Native
Urtica dioica	stinging nettle		Native
Urtica urens	annual stinging nettle		Introduced
Veronica anagallis-aquatica	water speedwell		Introduced

Scientific Name	Common Name	Status	Native or Introduced
Grasses			
Arundo donax	giant reed		Introduced; Cal-IPC High
Bromus diandrus	ripgut brome		Introduced; Cal-IPC Moderate
Bromus rubens	red brome		Introduced; Cal-IPC High
Elymus condensatus	giant wild rye		Native
Elymus triticoides	beardless wild rye		Native
Festuca perennis	Italian rye grass		Introduced; Cal-IPC Moderate
Hordeum murinum	foxtail barley		Introduced; Cal-IPC Moderate
Vines			
Cuscuta sp.	–		Native
Marah macrocarpa.	wild cucumber		Native
Parthenocissus sp.	–		Introduced
Toxicodendron diversilobum	poison oak		Native

CRPR: California Rate Plant Rank

Cal-IPC Inventory for Southwest Jepson Region

CTO: City of Thousand Oaks Protected Tree

Wildlife Species Observed Within the Wildlife Survey Area on April 23 and April 30, 2021

Scientific Name	Common Name	Status	Native or Introduced
Birds			
Anas platyrhynchos	Mallard		Native
Aphelocoma californica	California scrub jay		Native
Buteo jamaicensis	Red tailed hawk		Native
Calypte anna	Anna's hummingbird		Native
Melozone crissalis	California towhee		Native
Spinus psaltria	Lesser goldfinch		Native
Zenaida macroura	Mourning dove		Native
Reptiles			
Crotalus oreganus helleri	Southern Pacific rattlesnake		Native
Sceloporus occidentalis	Western fence lizard		Native
Mammals			
Neotoma sp.	woodrat		Native
Odocoileus hemionus californicus	California mule deer		Native
Otospermophilus beecheyi	California ground squirrel		Native

Rodewald, P. (Editor). 2021. The Birds of North America. Cornell Laboratory of Ornithology, Ithaca, NY. https://birdsna.org/Species-Account/bna/home. Accessed: 27 April.

California Herps. 2021. A Guide to the Amphibians and Reptiles of California. http://www.california herps.com/index.html. Accessed: 27 April.

Appendix D

Special Status Species Evaluation Tables

Special Status Species Evaluation Tables

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Plants				
Abronia maritima red sand-verbena	None/None G4/S3? 4.2	Perennial herb. Blooms Feb-Nov. Occurs in coastal dunes of central and southern California, as well as the Channel Islands. Formerly fairly widespread, but available habitat has decreased, especially in Southern California. Under 100m (330ft).	Not expected	No coastal dune habitat is present in the rare plant survey area.
Asplenium vespertinum western spleenwort	None/None G4/S4 4.2	Chaparral, Cismontane woodland, Coastal scrub. rocky. 180 - 1000 m. perennial rhizomatous herb. Blooms Feb-Jun	Not expected	Potentially suitable cismontane woodland and coastal scrub are present in the rare plant survey area. However, the rare plant survey area is outside of elevation range for this species.
Astragalus brauntonii Braunton's milk-vetch	FE/None G2/S2 1B.1	Perennial herb. Blooms January to August. Closed-cone coniferous forest, chaparral, coast scrub, valley and foothill grassland. Recent burns or disturbed areas; in saline, somewhat alkaline soils high in Ca, Mg, with some K. Soil specialist; requires shallow soils to defeat pocket gophers and open areas, preferably on hilltops, saddles or bowls between hills. 200-650m (655-2130ft).	Not expected	The rare plant survey area is outside of elevation range for this species. Although parts of the rare plant survey area were recently burned, soils present are not suitable.
Atriplex coulteri Coulter's saltbush	None/None G3/S1S2 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, Valley and foothill grassland. alkaline or clay. 3 - 460 m. perennial herb. Blooms Mar-Oct	Not expected	No coastal bluff scrub or coastal dune habitats are present in the rare plant survey area. Coastal scrub and grasslands are present, but alkaline soils are not present.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Baccharis malibuensis Malibu baccharis	None/None G1/S1 1B.1	Perennial deciduous shrub. Blooms August. Coastal scrub, chaparral, cismontane woodland. In Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 150-260m (490-855ft).	Not expected	Potentially suitable coastal scrub and cismontane woodland is present in the rare plant survey area. However, the rare plant survey area is outside of elevation range for this species and soil types present are not suitable. This perennial shrub was not observed during April 2021 rare plant surveys.
Calochortus catalinae Catalina mariposa lily	None/None G3G4/S3S4 4.2	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland. 15 - 700 m. perennial bulbiferous herb. Blooms (Feb) Mar-Jun	Low potential	Potentially suitable cismontane woodland, coastal scrub, and grassland are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Calochortus clavatus var. *clavatus* club-haired mariposa lily	None/None G4T3/S3 4.3	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland. usually serpentinite, clay, rocky. 75 - 1300 m. perennial bulbiferous herb. Blooms (Mar) May-Jun	Not expected	Potentially suitable cismontane woodland, coastal scrub, and grassland are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area. Serpentine soils are not present.
Calochortus clavatus var. *gracilis* slender mariposa lily	None/None G4T2T3/S2S3 1B.2	Perennial bulbiferous herb. Blooms March to June. Chaparral, coastal scrub. Shaded foothill canyons; often on grassy slopes within other habitat. 420-760m (1380-2495ft).	Not expected	Potentially suitable foothill canyons and coastal scrub are present in the rare plant survey area. However, the rare plant survey area is outside of elevation range for this species and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Calochortus plummerae Plummer's mariposa lily	None/None G4/S4 4.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland. granitic, rocky. 100 - 1700 m. perennial bulbiferous herb. Blooms May-Jul	Not expected	Potentially suitable cismontane woodland, coastal scrub, and grasslands are present in the rare plant survey area. However, soils present are not suitable and the only CNDDB occurrence within 5 miles of the rare plant survey area is from before 1999.
Camissoniopsis lewisii Lewis' evening-primrose	None/None G4/S4 3	Coastal bluff scrub, Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland. sandy or clay. 0 - 300 m. annual herb. Blooms Mar-May (Jun)	Not expected	Potentially suitable cismontane woodland, coastal scrub, and grasslands are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Centromadia parryi ssp. *australis* southern tarplant	None/None G3T2/S2 1B.1	Marshes and swamps (margins), Valley and foothill grassland (vernally mesic), Vernal pools. 0 - 480 m. annual herb. Blooms May-Nov	Not expected	No suitable marshes and swamps, vernally mesic grasslands, or vernal pools are present in the rare plant survey area.
Cercocarpus betuloides var. *blancheae* island mountain-mahogany	None/None G5T4/S4 4.3	Closed-cone coniferous forest, Chaparral. 30 - 600 m. perennial evergreen shrub. Blooms Feb-May	Not expected	No suitable coniferous forests or chaparral are present in the rare plant survey area. This perennial shrub was not observed during April 2021 rare plant surveys.
Chaenactis glabriuscula var. *orcuttiana* Orcutt's pincushion	None/None G5T1T2/S1 1B.1	Coastal bluff scrub (sandy), Coastal dunes. 0 - 100 m. annual herb. Blooms Jan-Aug	Not expected	No suitable coastal bluff scrub or coastal dunes are present in the rare plant survey area.
Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	FE/SE G4?T1/S1 1B.2	Occurs in coastal dunes and coastal salt marshes and swamps. This species blooms between May and October, and typically occurs at elevations ranging from 0-30 meters.	Not expected	No suitable coastal dunes or coastal salt marshes and swamps are present in the rare plant survey area. The rare plant survey area is outside of elevation range for this species.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Chorizanthe parryi var. *parryi* Parry's spineflower	None/None G3T2/S2 1B.1	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland. sandy or rocky, openings. 275 - 1220 m. annual herb. Blooms Apr-Jun	Not expected	Potentially suitable cismontane woodland, coastal scrub, and grasslands are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area and the location is outside of elevation range for this species.
Convolvulus simulans small-flowered morning-glory	None/None G4/S4 4.2	Chaparral (openings), Coastal scrub, Valley and foothill grassland. clay, serpentinite seeps. 30 - 740 m. annual herb. Blooms Mar-Jul	Not expected	Potentially suitable coastal scrub and grasslands are present in the rare plant survey area. However, serpentinite seeps are not present and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Deinandra minthornii Santa Susana tarplant	None/SR G2/S2 1B.2	Perennial deciduous shrub. Blooms July to November. Chaparral, coastal scrub. On sandstone outcrops and crevices, in shrubland. 280-760m (1920-2495ft).	Not expected	Potentially suitable coastal scrub is present in the rare plant survey area. However, the rare plant survey area is outside of elevation range for this species. This perennial shrub was not observed during April 2021 rare plant surveys.
Delphinium parryi ssp. *blochmaniae* dune larkspur	None/None G4T2/S2 1B.2	Chaparral (maritime), Coastal dunes. 0 - 200 m. perennial herb. Blooms Apr-Jun	Not expected	No suitable maritime chaparral or coastal dunes are present in the rare plant survey area.
Delphinium parryi ssp. *purpureum* Mt. Pinos larkspur	None/None G4T4/S4 4.3	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland. 1000 - 2600 m. perennial herb. Blooms May-Jun	Not expected	No suitable chaparral, Mojavean desert scrub, or pinyon and juniper woodlands are present in the rare plant survey area. The rare plant survey area is outside of elevation range for this species.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Dichondra occidentalis western dichondra	None/None G3G4/S3S4 4.2	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland. 50 - 500 m. perennial rhizomatous herb. Blooms (Jan) Mar-Jul	Low potential	Potentially suitable cismontane woodland, coastal scrub, and grassland habitats are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area. Species would have been blooming and detectable during the rare plant survey and was not observed.
Dudleya blochmaniae ssp. *blochmaniae* Blochman's dudleya	None/None G3T2/S2 1B.1	Occurs in rocky, often clay or serpentinite substrates within coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland. This species blooms between April and June, and typically occurs at elevations ranging from 5-450 meters.	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys.
Dudleya cymosa ssp. *agourensis* Agoura Hills dudleya	FT/None G5T1/S1 1B.2	Perennial herb. Blooms May to June. Chaparral, cismontane woodland. Rocky, volcanic breccia. 200-500m (655-1640ft).	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys. The location is outside of elevation range for this species and no CNDDB observations have been recorded within 5 miles of the rare plant survey area
Dudleya cymosa ssp. *marcescens* marcescent dudleya	FT/SR G5T2/S2 1B.2	Perennial herb. Blooms April to July. Chaparral. On sheer rock surfaces and rocky volcanic cliffs. 150-520m (490-1705ft).	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys. The rare plant survey area is outside of elevation range for this species.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Dudleya cymosa ssp. *ovatifolia* Santa Monica dudleya	FT/None G5T1/S1 1B.1	Perennial herb. Blooms March to June. Chaparral, coastal scrub. In canyons on sedimentary conglomerates; primarily north-facing slopes. 210-500m (690-1640ft).	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys. The rare plant survey area is outside of elevation range for this species.
Dudleya parva Conejo dudleya	FT/None G1/S1 1B.2	Coastal scrub, Valley and foothill grassland. rocky or gravelly, clay or volcanic. 60 - 450 m. perennial herb. Blooms May-Jun	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys.
Dudleya verityi Verity's dudleya	FT/None G1/S1 1B.1	Chaparral, Cismontane woodland, Coastal scrub. volcanic, rocky. 60 - 120 m. perennial herb. Blooms May-Jun	Not expected	A potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys.
Eriogonum crocatum conejo buckwheat	None/SR G1/S1 1B.2	Chaparral, Coastal scrub, Valley and foothill grassland. Conejo volcanic outcrops, rocky. 50 - 580 m. perennial herb. Blooms Apr-Jul	Not expected	Potentially suitable coastal scrub and grasslands are present in the rare plant survey area, and a potentially suitable rocky outcrop is present in the rare plant survey area; however, this species was not observed during the April 2021 rare plant surveys.
Hordeum intercedens vernal barley	None/None G3G4/S3S4 3.2	Coastal dunes, Coastal scrub, Valley and foothill grassland (saline flats and depressions), Vernal pools. 5 - 1000 m. annual herb. Blooms Mar-Jun	Not expected	No suitable costal dunes, saline grasslands, or vernal pools present in the rare plant survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Horkelia cuneata var. *puberula* mesa horkelia	None/None G4T1/S1 1B.1	Perennial herb. Blooms February to September. Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. 70-810m (230-2655ft).	Not expected	Potentially suitable cismontane woodland and coastal scrub habitats are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	None/None G4T2/S2 1B.1	Annual herb. Blooms February to June. Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-1400m (3-4595ft).	Not expected	Soils present in the rare plant survey area are not suitable and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Lepechinia fragrans fragrant pitcher sage	None/None G3/S3 4.2	Chaparral. 20 - 1310 m. perennial shrub. Blooms Mar-Oct	Not expected	No suitable chaparral is present in the rare plant survey area. No CNDDB observations have been recorded within 5 miles of the rare plant survey area. This perennial shrub was not observed during the April 2021 rare plant surveys.
Lilium humboldtii ssp. *ocellatum* ocellated Humboldt lily	None/None G4T4?/S4? 4.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland. openings. 30 - 1800 m. perennial bulbiferous herb. Blooms Mar-Jul (Aug)	Not expected	Potentially suitable cismontane woodland, coastal scrub, and riparian woodland habitats are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area. This perennial herb was not observed during the April 2021 rare plant surveys.
Lupinus paynei Payne's bush lupine	None/None G1Q/S1 1B.1	Coastal scrub, Riparian scrub, Valley and foothill grassland. Sandy. 220 - 420 m. perennial shrub. Blooms Mar-Apr (May-Jul)	Not expected	Potentially suitable coastal scrub, riparian scrub and grassland habitats are present in the rare plant survey area; however, soils are not suitable, and the rare plant survey area is outside of elevation range for this species.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Monardella hypoleuca ssp. *hypoleuca* white-veined monardella	None/None G4T3/S3 1B.3	Perennial herb. Blooms April to December. Chaparral, cismontane woodland. Dry slopes. 50-1525m (165-5005ft).	Low potential	Potentially suitable cismontane woodland is present in the rare plant survey area. Species would have been blooming and detectable during the rare plant survey and was not observed.
Monardella sinuata ssp. *gerryi* Gerry's curly-leaved monardella	None/None G3T1/S1 1B.1	Coastal scrub. Sandy openings. 150 - 245 m. annual herb. Blooms Apr-Jun	Not expected	Potentially suitable coastal scrub is present in the rare plant survey area. However, the location is outside of elevation range for this species.
Monardella sinuata ssp. *sinuata* southern curly-leaved monardella	None/None G3T2/S2 1B.2	Chaparral, Cismontane woodland, Coastal dunes, Coastal scrub (openings). Sandy. 0 - 300 m. annual herb. Blooms Apr-Sep	Not expected	Potentially suitable cismontane woodland and coastal scrub habitats are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Navarretia ojaiensis Ojai navarretia	None/None G2/S2 1B.1	Annual herb. Blooms May to July. Chaparral, coastal scrub, valley and foothill grassland. Openings in shrublands or grasslands. Typically occurs on clay soils. 275-620m (900-2035ft).	Not expected	Potentially suitable coastal scrub and grassland habitats are present in the rare plant survey area. However, soils are not suitable, and the rare plant survey area is outside of elevation range for this species.
Nolina cismontana chaparral nolina	None/None G3/S3 1B.2	Chaparral, Coastal scrub. sandstone or gabbro. 140 - 1275 m. perennial evergreen shrub. Blooms (Mar) May-Jul	Not expected	Potentially suitable coastal scrub is present in the rare plant survey area. However, the location is outside of elevation range for this species and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Orcuttia californica California Orcutt grass	FE/SE G1/S1 1B.1	Vernal pools. 15 - 660 m. annual herb. Blooms Apr-Aug	Not expected	No suitable vernal pools are present in the rare plant survey area and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Pentachaeta lyonii Lyon's pentachaeta	FE/SE G1/S1 1B.1	Annual herb. Blooms March to August. Chaparral, valley and foothill grassland, coastal scrub. Edges of clearing in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. 30-630m (100-2065ft).	Not expected	Potentially suitable grassland and coastal scrub habitats are present in the rare plant survey area, outside project area. However, the herbaceous layer is dense with weeds and this species was not observed during rare plants surveys conducted in April 2021 during the blooming period for this species.
Phacelia hubbyi Hubby's phacelia	None/None G4/S4 4.2	Chaparral, Coastal scrub, Valley and foothill grassland. gravelly, rocky, talus. 0 - 1000 m. annual herb. Blooms Apr-Jul	Not expected	Potentially suitable coastal scrub and grassland habitats are present in the rare plant survey area. However, soils are not suitable and no CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Phacelia ramosissima var. *austrolitoralis* south coast branching phacelia	None/None G5?T3Q/S3 3.2	Chaparral, Coastal dunes, Coastal scrub, Marshes and swamps (coastal salt). sandy, sometimes rocky. 5 - 300 m. perennial herb. Blooms Mar-Aug	Not expected	No suitable chaparral, coastal dunes, or coastal salt marshes and swamps are present in the rare plant survey area. Potentially suitable coastal scrub is present, but no CNDDB observations have been recorded within 5 miles of the rare plant survey area. This perennial herb was not observed during the April 2021 rare plant surveys.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Piperia michaelii Michael's rein orchid	None/None G3/S3 4.2	Coastal bluff scrub, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest. 3 - 915 m. perennial herb. Blooms Apr-Aug	Not expected	Potentially suitable cismontane woodland and coastal scrub are present in the rare plant survey area. However, no CNDDB observations have been recorded within 5 miles of the rare plant survey area. This perennial herb was not observed during the April 2021 rare plant surveys.
Pseudognaphalium leucocephalum white rabbit-tobacco	None/None G4/S2 2B.2	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland. sandy, gravelly. 0 - 2100 m. perennial herb. Blooms (Jul) Aug-Nov (Dec)	Not expected	Potentially suitable cismontane woodland, coastal scrub, and riparian woodland habitats are present in the rare plant survey area. However, soil types present are not suitable and no CNDDB observations have been recorded within 5 miles of the rare plant survey area. This perennial herb was not observed during the April 2021 rare plant surveys.
Quercus dumosa Nuttall's scrub oak	None/None G3/S3 1B.1	Closed-cone coniferous forest, Chaparral, Coastal scrub. sandy, clay loam. 15 - 400 m. perennial evergreen shrub. Blooms Feb-Apr (May-Aug)	Not expected	Potentially suitable coastal scrub habitat is present in the rare plant survey area. However, this perennial shrub was not observed during the April 2021 rare plant surveys.
Senecio aphanactis chaparral ragwort	None/None G3/S2 2B.2	Chaparral, Cismontane woodland, Coastal scrub. sometimes alkaline. 15 - 800 m. annual herb. Blooms Jan-Apr (May)	Low potential	Potentially suitable cismontane woodland and coastal scrub habitats are present in the rare plant survey area. Species would have been blooming and detectable during the rare plant survey and was not observed.
Suaeda esteroa estuary seablite	None/None G3/S2 1B.2	Marshes and swamps (coastal salt). 0 - 5 m. perennial herb. Blooms (May) Jul-Oct (Jan)	Not expected	No suitable coastal salt marshes and swamps are present in the rare plant survey area. Location is outside of elevation range for this species.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Suaeda taxifolia woolly seablite	None/None G4/S4 4.2	Coastal bluff scrub, Coastal dunes, Marshes and swamps (margins of coastal salt). 0 - 50 m. perennial evergreen shrub. Blooms Jan-Dec	Not expected	No suitable coastal bluff scrub, coastal dunes, or coastal salt marshes and swamps are present in the rare plant survey area.
Texosporium sancti-jacobi woven-spored lichen	None/None G3/S1 3	Chaparral (openings). On soil, small mammal pellets, dead twigs, and on Selaginella spp. 60 - 660 m. crustose lichen (terricolous). Blooms	Not expected	No suitable chaparral is present in the rare plant survey area. No CNDDB observations have been recorded within 5 miles of the rare plant survey area.
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	None/None G5T3/S2 2B.2	Meadows and seeps (seeps and streams). 50 - 610 m. perennial rhizomatous herb. Blooms Jan-Sep	Not expected	While suitable stream habitat is present within the rare plant survey area, no CNDDB observations have been recorded within 5 miles of the rare plant survey area. T Species would have been detectable during the rare plant survey and was not observed.
Tortula californica California screw-moss	None/None G2G3/S2S3 1B.2	Chenopod scrub, Valley and foothill grassland. sandy, soil. 10 - 1460 m. moss.	Not expected	Potentially suitable grassland is present in the rare plant survey area, but grassland soils are not suitable.
Invertebrates				
Bombus crotchii Crotch bumble bee	None/SCE G3G4/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	Low potential	Potentially suitable floral resources are present in the wildlife survey area.
Fishes				
Gila orcuttii arroyo chub	None/None G2/S2 SSC	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave & San Diego river basins. Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	High potential	Habitat in Arroyo Conejo Creek is potentially suitable. This species was observed in Arroyo Conejo Creek in 2020, including in the wildlife survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Oncorhynchus mykiss irideus pop. 10 steelhead - southern California DPS	FE/None G5T1Q/S1	Federal listing refers to populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water and more variable conditions.	Low potential	Habitat in Arroyo Conejo Creek is potentially suitable. The only CNDDB occurrence within 5 miles of the wildlife survey area was recorded in 2013, approximately 4 miles from the wildlife survey area. The observation was in Conejo Creek, approximately 5 miles downstream of the point where Arroyo Conejo Creek joins Conejo Creek.
Reptiles				
Anniella stebbinsi Southern California legless lizard	None/None G3/S3 SSC	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Low potential	Potentially suitable habitat and soils are present in the wildlife survey area.
Aspidoscelis tigris stejnegeri coastal whiptail	None/None G5T5/S3 SSC	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland & riparian areas. Ground may be firm soil, sandy, or rocky.	Moderate potential	Potentially suitable woodland and riparian habitats are present in the wildlife survey area. However, no CNDDB observation are located within 5 miles of the wildlife survey area.
Emys marmorata western pond turtle	None/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	High potential	Habitat in Arroyo Conejo Creek is potentially suitable. This species was observed in Arroyo Conejo Creek in 2000, including in the wildlife survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	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, and abundant supply of ants and other insects.	Moderate potential	Potentially suitable habitat and soils are present in the wildlife survey area, though non-developed open areas are limited due to the dense herbaceous layer. The only CNDDB occurrence within 5 miles of the wildlife survey area is located approximately 2.5 miles north.
Thamnophis hammondii two-striped gartersnake	None/None G4/S3S4 SSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	Moderate potential	Habitat in Arroyo Conejo Creek is potentially suitable. However, the most recent CNDDB occurrence within 5 miles of the wildlife survey area is from 2009 and is located approximately 4.75 miles south.
Birds				
Accipiter cooperii Cooper's hawk	None/None G5/S4 WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks.	Present	This species was documented on the site during 2018 field surveys (Padre Associates, Inc. 2018)
Aimophila ruficeps canescens southern California rufous-crowned sparrow	None/None G5T3/S3 WL	Resident in Southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	Low potential	Potentially suitable coastal sage scrub, chaparral, and grassland habitats are present in the wildlife survey area. However, no CNDDB observation are located within 5 miles of the wildlife survey area.
Asio flammeus *short-eared owl*	None/None G5/S3 SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	Not expected	No suitable tule patches or tall grass patches are present in the wildlife survey area. No CNDDB observation are located within 5 miles of the wildlife survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Low potential	Potentially suitable riparian, woodland, and grassland habitats are present in the wildlife survey area. However, no CNDDB observation are located within 5 miles of the wildlife survey area.
Eremophila alpestris actia California horned lark	None/None G5T4Q/S4 WL	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills. Short-grass prairie, bald hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	Not expected	No suitable open prairie, meadow, or plain habitats are present in the wildlife survey area. No CNDDB observation are located within 5 miles of the wildlife survey area.
Icteria virens yellow-breasted chat	None/None G5/S3 SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	Moderate potential	Potentially suitable riparian habitat is present in the wildlife survey area. However, no CNDDB observation are located within 5 miles of the wildlife survey area.
Pandion haliaetus osprey	None/None G5/S4 WL	Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	Low potential	Fish may inhabit the creeks in the wildlife survey area. However, no CNDDB observation are located within 5 miles of the wildlife survey area.
Polioptila californica californica coastal California gnatcatcher	FT/None G4G5T2Q/S2 SSC	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	Low potential	Potentially suitable coastal sage scrub is present at the edges of the wildlife survey area. However, no suitable habitat is within 100 feet of site. Multiple CNDDB occurrences have been documented within 5 miles of the wildlife survey area.
Riparia riparia bank swallow	None/ST G5/S2	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	Not expected	No cliffs suitable for nesting are present in the wildlife survey area and this species is considered extirpated as a breeder in southern California.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Setophaga petechia yellow warbler	-/- G5/S3S4 SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Present	This species was documented on the site during 2018 field surveys (Padre Associates, Inc. 2018)
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S2	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.	High potential	Potentially suitable riparian habitat is present in the wildlife survey area. Multiple CNDDB occurrences have been documented within 5 miles of the wildlife survey area; however, all these observations are on Conejo Creek.
Mammals				
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low potential	Live and dead tree potentially suitable for nesting are present in the wildlife survey area. However, the nearest CNDDB occurrence is from 2004 and is located approximately 10 miles to the east.
Eumops perotis californicus western mastiff bat	None/None G4G5T4/ S3S4 SSC	Occurs in open, semi-arid to arid habitats, including coniferous and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces and caves, and buildings. Roosts typically occur high above ground.	Low potential	No cliff faces or caves suitable for roosting occur in the wildlife survey area. However, potentially suitable cliffs occur in the area, so this species may forage in the wildlife survey area. The nearest CNDDB occurrence is from 2004 and is located approximately 9 miles to the east.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Lasiurus cinereus hoary bat	None/None G3G4/S4	Typically roosts in trees in deciduous and coniferous forests and woodlands but occasionally roosts in rocks crevices. Forages in open areas, typically along riparian corridors or over water. Diet primarily consists of moths.	Moderate potential	Trees in wildlife survey area may be suitable for roosting. Riparian habitat and open water may provide suitable foraging grounds. However, the nearest CNDDB occurrence is from 2004 and is located approximately 11 miles to the southeast.
Macrotus californicus California leaf-nosed bat	None/None G3G4/S3	Desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub and palm oasis habitats. Needs rocky, rugged terrain with mines or caves for roosting.	Not expected	No suitable desert habitats or rocky outcrops are present in the wildlife survey area.
Myotis ciliolabrum western small-footed myotis	None/None G5/S3	Occurs in a wide range of arid and semiarid habitats including woodlands, open forests, riparian zones, and desert shrub. Roosts in rock crevices in caves, tunnels, and mines, also found beneath loose bark and in buildings. Forages for insects over water sources.	Moderate potential	Preferred roosting sites are not present in the wildlife survey area; however, potentially suitable rocky cliffs are nearby. Riparian habitat and open water may provide suitable foraging grounds. However, the nearest CNDDB occurrence is from 2004 and is located approximately 9 miles to the east.
Myotis yumanensis Yuma myotis	None/None G5/S4	Occurs in a variety of lowland and upland habitats including desert scrub, riparian, and woodlands and forests. Distribution is closely tied to bodies of water. Roosts in a variety of areas including caves, cliffs, mines, crevices in live trees, and buildings and other man-made structures.	Low potential	Potentially suitable forage and roost habitats are present in the wildlife survey area. However, the nearest CNDDB occurrence is from 2004 and is located approximately 10 miles to the southeast.
Neotoma lepida intermedia San Diego desert woodrat	None/None G5T3T4/S3S4 SSC	Occurs in scrub habitats of southern California from San Luis Obispo County to San Diego County.	Moderate potential	Potentially suitable coastal scrub and chaparral habitats are present in the wildlife survey area.

Scientific Name Common Name	Status*	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Sensitive Natural Communities				
Southern Riparian Forest	None/None G4/S4	–	Not expected	Not observed in the wildlife survey area during April 2021 surveys.
Southern Riparian Scrub	None/None G3/S3.2	–	Present	Arroyo willow thickets were observed along Arroyo Conejo and North Fork Arroyo Conejo during the April 2021 surveys.
Southern Sycamore Alder Riparian Woodland	None/None G4/S4	–	Not expected	Not observed in the wildlife survey area during April 2021 surveys.
Valley Needlegrass Grassland	None/None G3/S3.1	–	Not expected	Not observed in the wildlife survey area during April 2021 surveys.
Valley Oak Woodland	None/None G3/S2.1	–	Not expected	Not observed in the wildlife survey area during April 2021 surveys.

***Federal and State Status**

FE Federal Endangered
FT Federal Threatened
SE California Endangered
ST California Threatened
CSE Candidate for California Endangered
SSC California Species of Special Concern
FP Fully Protected, CDFW
WL Watch List, CDFW
SR Rare, CDFW

California Rare Plant Rank (CRPR)

CRPR 1A Presumed to be extirpated or extinct
CRPR 1B Rare or endangered in California and elsewhere
CRPR 2 Rare or endangered in California but more common elsewhere
CRPR 3 Insufficient information to assign to another rank or to reject from ranking
CRPR 4 Limited distribution or infrequent throughout a broader area in California

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Appendix E

Jurisdictional Delineation Report

Rincon Consultants, Inc.
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July 23, 2021
Project Number: 21-11191

Brian Stark, COSCA Administrator
Conejo Open Space Conservation Agency
2100 East Thousand Oaks Boulevard
Thousand Oaks, California 91362
Via email: bstark@toaks.org

Subject: Jurisdictional Delineation within the Conejo Canyon Bridge at Hill Canyon Treatment Plant (CI 5527) Project Site, in the City of Thousand Oaks, Ventura County, California

Dear Mr. Stark:

This Jurisdictional Delineation Report has been prepared by Rincon Consultants, Inc. (Rincon) to assist the City of Thousand Oaks (City) with an assessment of aquatic resources within the subject property. This report identifies the extent of United States Army Corps of Engineers (USACE) jurisdiction within the Arroyo Conejo and the North Fork Arroyo Conejo and adjacent wetlands within the project boundary under Section 404 of the Clean Water Act. This report also identifies the extent of state waters regulated by the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act; and the California Department of Fish and Wildlife (CDFW) jurisdiction pursuant to California Fish and Game Code (CFGC) Section 1600 *et seq*.

Summary of Project Description

The Conejo Open Space Conservation Agency (COSCA), a joint powers authority consisting of the City, the Conejo Recreation and Park District, and the City's Public Works Department are proposing the Conejo Canyons Bridge Project (project). The project will be composed of a new bridge which would span Arroyo Conejo Creek in Hill Canyon, and an associated access road to connect the eastern side of the new bridge to the existing Hill Canyon Road.

The purpose of the new bridge is to provide access to existing open space areas for outdoor recreationists as well as City and COSCA staff vehicles. The bridge would connect existing trails on either side of the creek and would provide a key link in the trail system between the Conejo Canyons and Wildwood open space areas.

The bridge is proposed as a single-span design, meaning that it spans one section between two supports, anchored on either end with no supports in the middle. The bridge would be secured to concrete abutments on either side of the creek. The bridge would be manufactured off-site and installed using a crane to lower it into place. The bridge footings would consist of concrete abutments positioned at the top of the stream banks to avoid intrusion into the channel.

The proposed bridge would be approximately 140 feet long. An access road that would connect the bridge to Hill Canyon Road would be approximately 375 feet long.

A culvert will be installed at approximately the midpoint of the new access road to accommodate an existing swale. The culvert will be an 18-inch high-density polyethylene (HDPE) corrugated pipe approximately 80 feet long with grouted riprap pads at either end. The riprap pads would be approximately 5 feet long by 4 feet wide, for a total volume of 40 cubic feet.

Water would not need to be extracted or diverted for this project. However, groundwater may be encountered when piles are constructed for the eastern abutment. In anticipation of this, the contractor would prepare and submit a dewatering plan for approval that covers how expelled water would be captured and/or contained and treated. If necessary, a location for a sump has been identified adjacent to the project site. No construction would occur in Conejo Creek and erosion control measures would be in place to prevent soil from entering the stream.

Project Location

The project site is located in the City of Thousand Oaks, on the west side of Hill Canyon Road, approximately 1.75 miles south of the intersection of Santa Rosa Road and Hill Canyon Road, and approximately 330 feet northwest of the treatment ponds at the Hill Canyon Treatment Plant (Attachment 1, Figure 1. The project site is located on approximately 0.61 acre of a larger 495-acre parcel identified as Assessor's Parcel Number 667-0-120-160. The new bridge will span over Arroyo Conejo Creek in Hill Canyon.

The approximate center of the project site is located at latitude 34.211880°and longitude -118.926977° (WGS84). The project site is in Township 02 North, Range 20 West (San Bernardino meridian), and is depicted on the United States Geological Survey (USGS) *Newbury Park, California* 7.5-minute quadrangle map (USGS 2021a). It is bounded by the Hill Canyon Treatment Plant to the southeast and is otherwise surrounded by open space (Attachment 1, Figure 2). The jurisdictional delineation (JD) Survey Area (herein referred to as JD Survey Area) is located at elevations between 250 and 280 feet above mean sea level.

Methods

The JD Survey Area was established to contain all the project components adjacent to any potentially jurisdictional waters, including construction areas (i.e., impact areas) and grading limits, plus a 100-foot buffer. The JD Survey Area analyzed in this report encompasses approximately 4.65 acres (Attachment 1, Figure 2). The JD included a literature review of existing studies, maps, and other publications to identify wetlands and riparian resources that have been documented in the JD Survey Area. After completion of the literature review, a field delineation was conducted to identify, characterize, and map all potential jurisdictional waters within the JD Survey Area. The data that was collected was used to inform this JD report. The field delineation was conducted in accordance with USACE, CDFW, and RWQCB procedures, as outlined below. In addition, representative site photographs were taken (See Attachment 2). A plant list was compiled and is included in Attachment 3. Vegetation communities and land cover types were characterized and mapped, as outlined below. A detailed description of the applicable federal and state regulations is provided in Attachment 4.

Literature Review

Prior to the field survey, Rincon reviewed aerial imagery (Google Earth Pro 2021) depicting the JD Survey Area, the *Newbury Park, California* USGS 7.5-minute topographic quadrangle (USGS 2021a), the Web

Soil Survey by United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (USDA, NRCS 2021a), and the National Hydrography Dataset (USGS 2021b) to better characterize the site and its surroundings from a hydrologic and geologic/topographic perspective.

Additionally, the *National Wetlands Inventory* (NWI) (United States Fish and Wildlife Service 2021) and the *National Hydrography Dataset* (USGS 2021b) were reviewed to determine if any wetlands or other waters were previously documented and mapped in or near the JD Survey Area. The *National Hydric Soils List by State: California* (USDA, NRCS 2021b) was also reviewed to determine if any soil map units mapped in the JD Survey Area are classified as hydric.

Field Delineation

On April 23, 2021 and April 30, 2021, Rincon Senior Biologist/Regulatory Specialist Robin Murray and Associate Biologist Carolyn Welch conducted the JD on foot to characterize and map the limits of potential wetlands and non-wetland aquatic resources. Variables that determined federal and state jurisdiction included ordinary high-water mark (OHWM) and/or bed and bank of streams that constitute waters of the U.S, CDFW-jurisdictional streambed, waters of the State, and/or wetlands. Current federal and state policies, methods, and guidelines were used to identify and delineate potential jurisdictional areas, as described below in detail.

During the field delineation, Rincon biologists noted general site characteristics and documented vegetation present on-site, focusing on vegetation associated with any water features. Vegetation communities were classified using *A Manual of California Vegetation* (MCV2, Sawyer et al. 2009), which establishes systematic classifications and definitions of vegetation communities. For those vegetated areas that could not be classified per *A Manual of California Vegetation*, industry-standard vegetation community names were used. Additionally, land covers were characterized in areas that lacked vegetation. Data collection was focused at areas where the JD Survey Area intersected a potential water and chosen as best representation of the conditions at the site.

Non-Wetland Waters of the U.S.

The lateral limits of potential USACE jurisdiction (i.e., width) for non-wetland waters or tributaries are determined by the presence of physical characteristics indicative of the OHWM. The Code of Federal Regulations (CFR) sections (33 CFR 328.3 and 33 CFR 328.4) and Regulatory Guidance Letter No. 05-05 (USACE 2005), as well as in reference to various relevant technical publications including but not limited to *Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States* (USACE 2004), *Distribution of Ordinary High Water Mark (OHWM) Indicators and Their Reliability in Identifying the Limits of "Waters of the United States" in Arid Southwestern Channels* (USACE 2006), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008), and *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010) were reviewed. Additionally, Rincon evaluated sources of water, potential connections and distances to navigable waters, streams that are perennial or intermittent in nature and other factors that affect whether waters qualify as "waters of the U.S." under the current 2020 Navigable Waters Protection Rule.

Wetland Waters of the U.S.

Potential wetland features were evaluated for presence of wetland indicators; specifically, hydrophytic vegetation, hydric soils, and wetland hydrology, according to routine delineation procedure within the *Wetlands Delineation Manual* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valley and Coast Region* (USACE 2010). The USACE *Western Mountains, Valleys & Coast 2018 Regional Wetland Plant List* (USACE 2018) was used to determine the indicator status of the examined vegetation by the following indicator status categories: Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), and Obligate Wetland (OBL) (Lichvar et al. 2018).

Representative sample points were sited in areas most likely to exhibit wetland characteristics, i.e., a prevalence of hydrophytic vegetation and suitable landform, and examined in the field for potential wetland indicators. Sample points were not conducted in areas with an obvious prevalence of upland vegetation or in areas where the landform would not support wetland features, i.e., concrete channels and sloped areas. Due to the relatively small size of the JD Survey Area and the accessibility, all likely wetland areas could be directly observed and characterized, and the optional point-intercept transect method per Appendix B of the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* was not employed. Wetland Determination Data Forms are included in Attachment 3.

CDFW Streambed

The extent of potential streambeds, streambanks, lakes and riparian habitat subject to CDFW jurisdiction under Sections 1600 et seq. of the California Fish and Game Code was delineated by reviewing the topography and morphology of potentially jurisdictional features. Additionally, the outer limit of riparian vegetation, where present, or the tops of banks of stream features were assessed to establish the limits of potential CDFW jurisdiction.

Waters of the State

The limits of “waters of the State,” as defined under the Porter-Cologne Water Quality Control Act, were determined to be limited by the OHWM based on current interpretation of jurisdiction by the Los Angeles RWQCB. The delineated boundaries include all streams/channels exhibiting a OHWM within the JD Survey Area.

Potential State wetland features were evaluated pursuant to the State Water Resources Control Board’s (SWRCB) State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (SWRCB 2020). Potential state wetlands were evaluated following the SWRCB’s definition, and which relies on the same three parameters as the USACE definition (hydrophytic vegetation, wetland hydrology, and hydric soils) but allows for naturally unvegetated areas meeting the other two parameters to be considered wetlands.

Data Processing

The extent of jurisdictional features identified in the field and associated data were collected using Trimble Global Positioning System with sub-meter accuracy. All collected data were subsequently transferred to Rincon’s geographic information system (GIS) software package to depict the potential limits of state and federal jurisdiction. Representative photographs within the JD Survey Area are presented in Attachment 2.

Existing Setting

The JD Survey Area is located within Arroyo Conejo in the Conejo Valley, which is characterized by hot dry summers and mild winters typical of Mediterranean climate. Land uses within the Survey Area and the surrounding area consist of open space and paved roads. The topography of the JD Survey Area is characterized by a gradual slope towards the Arroyo Conejo and the North Fork Arroyo Conejo. The eastern portion of the JD Survey Area was heavily impacted by the Hill Fire in 2018 and native vegetation has been succeeded with post fire non-native herbaceous vegetation. The remaining portion of the JD Survey area primarily consisted of native riparian vegetation.

Hydrology

The JD Survey Area is located in both the Upper Conejo Arroyo watershed (HUC12 number 180701030104) and the Lower Conejo Arroyo watershed (HUC12 number 180701030105) (USGS 2021) (Attachment 1, Figure 3). The National Hydrography Dataset (NHD) and National Wetlands Inventory (NWI) identify two hydrologic features within the JD Survey Area: the Arroyo Conejo and the North Fork Arroyo Conejo.

The Arroyo Conejo is documented in NHD and NWI as a perennial stream. The NHD also identifies the North Fork Arroyo Conejo as a perennial stream; however, in contrast the NWI documents the North Fork Arroyo Conejo and its associated riparian habitat as a Palustrine shrub/scrub wetland that is temporarily flooded within the JD Survey Area. The perennial nature of both streams observed in the JD Survey Area during the field delineation verified that the descriptions in the NHD are valid. The North Fork Arroyo Conejo is a tributary to the Arroyo Conejo that flows north and is hydrologically connected to Conejo Creek, Calleguas Creek and finally the Pacific Ocean, which is a Traditionally Navigable Water (USFWS 2021c).

Soils

The NRCS delineates five soil map units within the JD Survey Area (USDA, NRCS, 2021a) (Attachment 1, Figure 4), which are described below. Site-specific observations of topsoil condition are consistent with those mapped by the NRCS Web Soil Survey.

Gilroy Loam, 15 to 50 Percent Slopes, Very Rocky

Gilroy series soils are moderately deep, well drained soils that occur on upland hillslopes and mountains. These soils are derived from weathered igneous and metamorphic rock. A typical soil profile consists of clay loam topsoil to 21 inches with underlining basic igneous rock to a depth of 28 inches. This soil map unit is not on the *National Hydric Soils List* (USDA, NRCS 2021b).

Hambright Very Rocky Loam, 15 to 75 Percent Slopes

Hambright series soils are shallow, well drained soils that occur on plateaus, basalt flats and hillslopes. These soils are derived from weathered igneous rocks, predominantly basalt. A typical soil profile consists of a very stony loam top soil to 12 inches underlain with basic igneous bedrock. This soil map unit is not on the *National Hydric Soils List* (USDA, NRCS 2021b).

Metz Loamy Sand, Loamy Substratum, 0 to 2 Percent Slopes

Metz series soils are very deep and somewhat excessively drained soils that occur on floodplains and alluvial fans. These soils are formed in predominantly by sedimentary rock. A typical soils profile consists of fine sandy loam in the top 12 inches that transitions to find sand and then sand to a depth of 38 inches. This soil map unit is not on the *National Hydric Soils List* (USDA, NRCS 2021b).

Riverwash

Riverwash occurs within and along perennial and intermittent streams including the Arroyo Conejo. Drainage is excessive due to the stony and gravelly soils. The land is typically inundated following storms and highly subject to scouring (USDA, NRCS 1970). This soil map unit is included on the *National Hydric Soils List* (USDA, NRCS 2020b).

Vina Loam, 2 to 9 Percent Slopes

Vina series soils are very deep, well drained soils that occur on alluvial fans. These soils are derived from volcanic rocks. The typical soil profile consists of a loam topsoil to 36 inches underlining by fine sandy loam to a depth of 66 inches. This soil map unit is not on the *National Hydric Soils List* (USDA, NRCS 2021b).

Vegetation Communities and Land Covers

Arroyo Willow – Mulefat Thickets (*Salix lasiolepis – Baccharis salicifolia* Shrubland Association)

This shrubland alliance is typically found along stream banks and benches, slope seeps, and stringers along drainages from sea level to 7,120 feet (2,170 meters) in elevation. Arroyo willow (*Salix lasiolepis*) provides at least 50% relative cover in the tree or shrub canopy, at least 25% absolute cover in the tree or shrub canopy, or at least 30% relative cover in the shrub canopy. Mulefat (*Baccharis salicifolia*) is present as a subdominant species in the shrub layer of this association. This vegetation community is ranked G4S4 and is not considered sensitive (CDFW 2020).

In the JD Survey Area, this vegetation community is found within the banks of Arroyo Conejo Creek and Forth Fork Arroyo Conejo Creek, as well as on the banks of the Hill Canyon Treatment Plant treatment ponds (Attachment 1, Figure 5). Arroyo willow is co-dominant in the tree and shrub canopies along with giant reed (*Arundo donax*) and mulefat. Occasional coast live oak (*Quercus agrifolia*) and Mexican fan palm (*Washingtonia robusta*) are present in the tree canopy. Other species commonly encountered in the shrub layer include sandbar willow (*Salix exigua*) and poison oak (*Toxicodendron diversilobum*). Herbaceous species present include ripgut brome (*Bromus diandrus*) and ragweed (*Ambrosia psilostachya*). Parts of this vegetation community, especially in the northern portion of the JD Survey Area, show evidence of fire damage, as trees and shrubs have charred branches and trunks.

California Walnut Groves (*Juglans californica* Forest & Woodland Alliance)

This woodland alliance is typically found on hillslopes and riparian corridors between 490 to 2,950 feet (150 to 900 meters) in elevation. California walnut (*Juglans californica*) is dominant or co-dominant in the tree canopy with white alder (*Alnus rhombifolia*), two petaled ash (*Fraxinus dipetala*), toyon (*Heteromeles arbutifolia*), coast live oak, valley oak (*Quercus lobata*), red willow (*Salix laevigata*), arroyo

willow, blue elderberry (*Sambucus nigra* ssp. *caerulea*) and California bay (*Umbellularia californica*). This alliance is ranked G3S3 and is considered sensitive (CDFW 2020).

This alliance is present in the northern portion of the JD Survey Area between Arroyo Conejo Creek and Hill Canyon Road, and just east of Hill Canyon Road (Attachment 1, Figure 5). California walnut is the dominant tree species, and the sparse shrub layer consists primarily of blue elderberry and California wild rose (*Rosa californica*). The majority of trees in the California walnut groves show evidence of fire damage. Many trees have charred trunks and branches. A dense herbaceous layer is present, dominated by black mustard (*Brassica nigra*).

Coyote Brush Scrub (*Baccharis pilularis* Shrubland Alliance)

This shrubland alliance is typically found on river mouths, stream sides, terraces, stabilized dunes of coastal bars, spits along the coastline, coastal bluffs, open slopes, and ridges between 0 to 4,921 feet (0 to 1,500 meters) in elevation. Soils are variable, from sandy to relatively heavy clay. Coyote brush (*Baccharis pilularis*) makes up more than 50 percent of the shrub layer. California coffeeberry (*Frangula californica*), poison oak, and coast silk tassel (*Garrya elliptica*) may be present as codominant species. This vegetation community is ranked G5S5 and is not considered sensitive (CDFW 2020).

This vegetation community is found on the uplands west of Arroyo Conejo Creek in the west corner of the JD Survey Area (Attachment 1, Figure 5). Coyote brush is dominant in the open shrub layer, with scattered mulefat and blue elderberry. The dense herbaceous layer is dominated by black mustard. This area shows evidence of fire damage. This community is also located within the eastern portion of the wildlife survey area, between the North Fork Arroyo Conejo Creek and Hill Canyon Road. The shrub layer in this area is dense and consists primarily of coyote brush, California sagebrush (*Artemisia californica*), giant wild rye (*Elymus condensatus*), and laurel sumac (*Malosma laurina*).

Mulefat Thickets (*Baccharis salicifolia* Shrubland Alliance)

Mulefat thickets are typically found within canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels, within mixed alluvial soils between sea level and 4,100 feet (1,250 meters) in elevation. Mulefat contributes to at least 30 percent relative cover in the shrub layer. This vegetation community is ranked G4S4 and is not considered sensitive (CDFW 2020).

In the JD survey area this alliance occurs in a small area on the uplands east of Arroyo Conejo Creek, between the ornamental woodland and upland mustards. This plant community is dominated by mulefat with scattered blue elderberry. The dense herbaceous layer is dominated by black mustard, red brome (*Bromus rubens*), and ripgut brome. This community is also present in a small area east of Arroyo Conejo Creek, surrounded by red brome grasslands. The area appears to have completely burnt in the 2018 Hill Fire and is currently populated by mulefat saplings and herbaceous non-natives.

Red Brome Grasslands (*Bromus rubens* Herbaceous Semi-Natural Alliance)

This herbaceous semi-natural alliance can be found in various topographies and soil settings, between sea level and 7,215 feet (2,200 meters). Red brome is dominant with over 80 percent cover in the herbaceous layer. This vegetation community is ranked GNASNA and is not considered sensitive (CDFW 2020).

This vegetation community is found in the center of the JD Survey Area, east of Arroyo Conejo Creek (Attachment 1, Figure 5). Red brome is dominant in the dense herbaceous layer, with ripgut brome, black mustard, summer mustard (*Hirschfeldia incana*), and fennel (*Foeniculum vulgare*), present as

subdominant species. According to aerial imagery, this vegetation community completely burned in the 2018 Hill Fire; however, successional growth of non-native herbaceous species obscures evidence of fire damage.

Upland Mustards (*Brassica nigra* Herbaceous Semi-Natural Alliance

This herbaceous semi-natural alliance is typically found in fallow fields, grasslands, roadsides, levee slopes, disturbed coastal scrub, riparian areas, cleared roadsides, and waste places between sea level and 4,920 feet (1,500 meters) in elevation. Black mustard, summer mustard, wild radish (*Raphanus sativus*), or other mustards occur with non-native plants at over 80 percent cover in the herbaceous layer. This vegetation community is ranked GNASNA and is not considered sensitive (CDFW 2020).

This vegetation community is present throughout the JD Survey Area, and is dominated by black mustard in the dense herbaceous layer (Attachment 1, Figure 5). Other commonly encountered herbaceous species include summer mustard, ripgut brome, fennel, and Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*). Parts of this community burned in the 2018 Hill Fire; however, successional growth of non-native herbaceous species obscure evidence of fire damage.

Field Results and Discussion

Based upon the jurisdictional delineation, two perennial streams are potentially subject to USACE, RWQCB and CDFW jurisdiction. Potential jurisdictional areas within the JD Survey Area are summarized below and depicted on Figure 6, Attachment 1.

Streams

Two perennial streams, the Arroyo Conejo and the North Fork Arroyo Conejo, were observed within the JD Survey Area.

Arroyo Conejo

The Arroyo Conejo enters the JD Survey Area from the southwest and flows in a northern direction to its confluence with the North Fork Arroyo Conejo. The stream has a OHWM defined by a bed and bank, change in vegetation and coverage, transition from cobble substrate to coarse sand and sandy loam, and surface water. In-channel unvegetated and vegetated gravel bars were also observed. The OHWM spans from approximately 40 feet wide upstream, approximately 50 feet just downstream of the confluence with the North Fork Arroyo Conejo and averaging 10 feet downstream of the confluence to the edge of the JD Survey Area. An arroyo willow-mulefat thicket riparian corridor extends on both sides of the OHWM spanning between 20 and 90 feet wide. Vegetated stream terraces were observed up to 4 feet in elevation above the OHWM, steeply sloping to the top of bank approximately 20 feet in elevation above the OHWM (Attachment 3, Ordinary High Water Mark Data Forms). During the field delineation, the Arroyo Conejo contained fast moving water with an average depth of 3 feet. Several deep pools were observed in channel with depths greater than 5 feet. The Arroyo Conejo conveys stormwater from housing developments upstream, and surface flows and subsurface drainage within Conejo Canyon. The Arroyo Conejo is classified in NHD and NWI as a perennial stream and was actively flowing during the field delineation.

North Fork Arroyo Conejo

The North Fork Arroyo Conejo enters the JD Survey Area from the east and flows in a western direction to its confluence with the Arroyo Conejo to the northwest. This stream has a OHWM defined by a bed and bank, change in vegetation, transition from cobble substrate to coarse sand and sandy loam. The OHWM spans on average approximately 10 feet across. An arroyo willow-mulefat thicket riparian corridor extends north and south of the channel; however, recent fire damaged has limited the width of the riparian habitat at its northern extent within the JD Survey Area to approximately 20 feet. The southern boundary of the riparian corridor is disturbed by an unpaved access roadway. During the survey water was observed flowing within the stream at an average depth of approximately two feet. The North Fork Arroyo Conejo conveys effluent from the Hill Canyon Treatment Plant upstream, stormwater from housing developments upstream, and surface flows and subsurface drainage from the watershed during and following rain events. Although NWI classifies this stream as a Palustrine shrub/scrub wetland, the NHD identifies the North Fork Arroyo Conejo as a perennial stream which is more consistent with what was observed during the field delineation.

Wetlands

Emergent wetlands were observed adjacent to the Arroyo Conejo and North Fork Arroyo Conejo. These fringe wetlands are approximately 2.5-foot wide band of emergent hydrophytic vegetation including water speedwell (*Veronica anagallis-aquatica*) that lines the OHWM on either side of the stream. In areas where steep banks occur, no wetland vegetation was observed. Very little organic matter was observed within the coarse, sandy soils in this area, and no indicators of hydric soils were detected. The soils are characterized and mapped as Riverwash, a hydric soil. Soils were presumed hydric due to their context within a vegetated sand or gravel bar within a floodplain, a naturally problematic soil condition. Wetland hydrology indicators including high water table, saturation, salt crusts and drift deposits up to 10 feet above surface water were observed (Attachment 3, Wetland Summary and Wetland Determination Data Forms).

Summary of Jurisdictional Areas

Potentially jurisdictional areas within the JD Survey Area are identified below in Table 1 and shown on Figure 6 in Attachment 1.

Table 1 USACE, CDFW and RWQCB Jurisdictional Areas

	USACE		CDFW	RWQCB	
Jurisdictional Area	Non-Wetland Waters of the U.S. (acres [lin. ft.])	Wetland Waters of the U.S. (acres)	CDFW Jurisdictional Streambed (acres [lin. ft.])	Non-wetland Waters of the State (acres [lin. ft.])	Wetland Waters of the State (acres)
Arroyo Conejo	0.16 (300)	0.03 (300)	0.84 (300)	0.16 (300)	0.03 (300)
North Fork Arroyo Conejo	0.10 (405)	0.04 (405)	1.64 (405)	0.10 (400)	0.04 (405)
Total	**0.26 (705)**	**0.07 (705)**	**2.47 (705)**	**0.26 (705)**	**0.07 (705)**

Conclusions

The Arroyo Conejo and North Fork Arroyo Conejo and associated adjacent wetlands are likely subject to regulations by the USACE and RWQCB under Sections 404 and 401 of the CWA, respectively, as well as CDFW pursuant to Section 1600 et seq. of the CFGC.

The findings and conclusions presented in this report, including the location and extent of areas subject to regulatory jurisdiction, are based on data collected in accordance with current USACE, CDFW, and RWQCB procedures. These findings and conclusions should be considered preliminary and subject to final discretion of the applicable resource agency.

Sincerely,
Rincon Consultants, Inc.

Carolynn Daman
Biologist/Regulatory Specialist

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Senior Biologist/Regulatory Specialist

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Director/Regulatory Specialist

Attachments

Attachment 1	Figures
Attachment 2	Representative Site Photographs
Attachment 3	Data Summary: Plants Observed within the Survey Area, Wetland Summary, Wetland Determination Data Forms, OHWM Forms
Attachment 4	Regulatory Framework

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Attachment 1

Figures

Figure 1 Regional Location

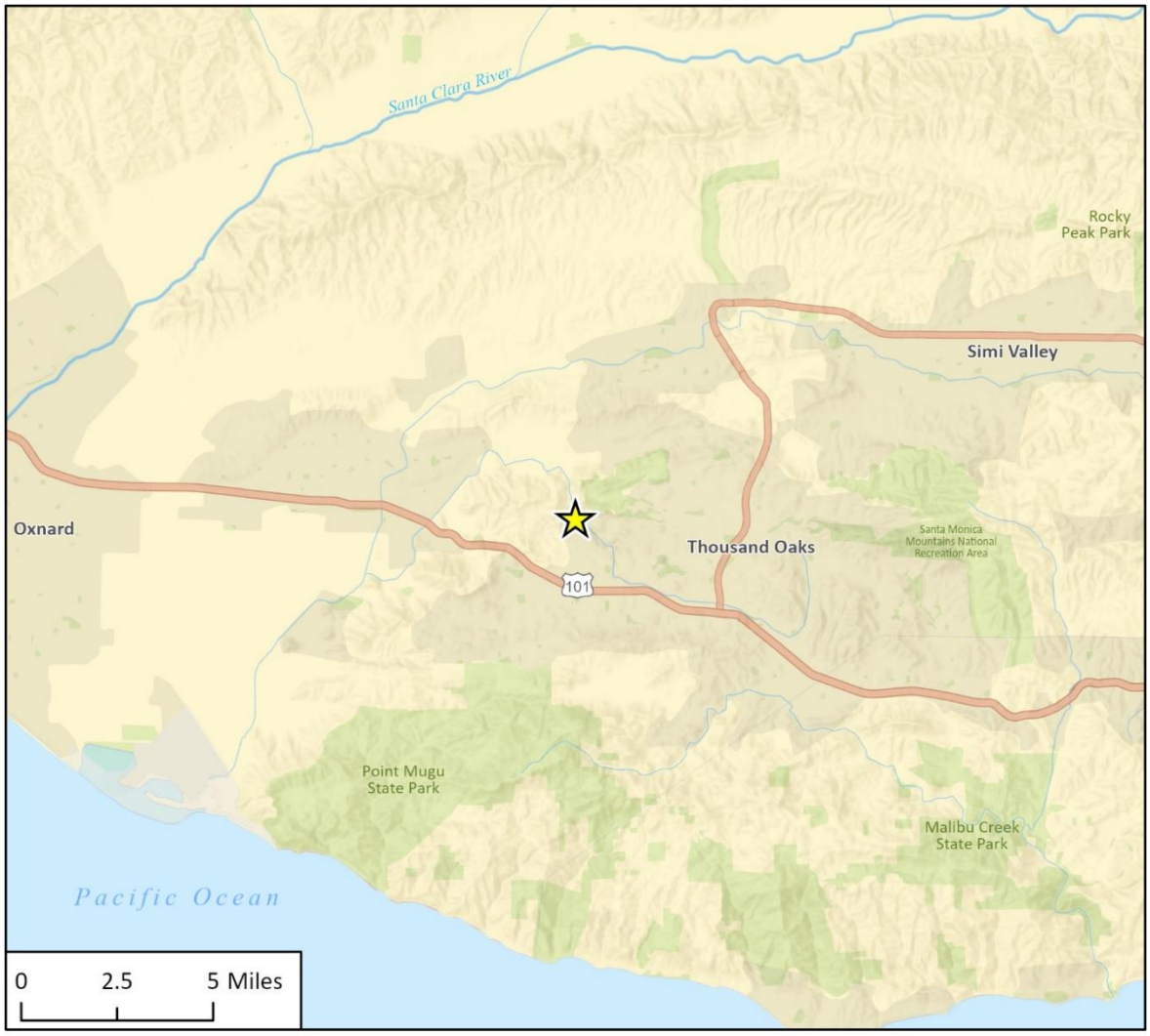
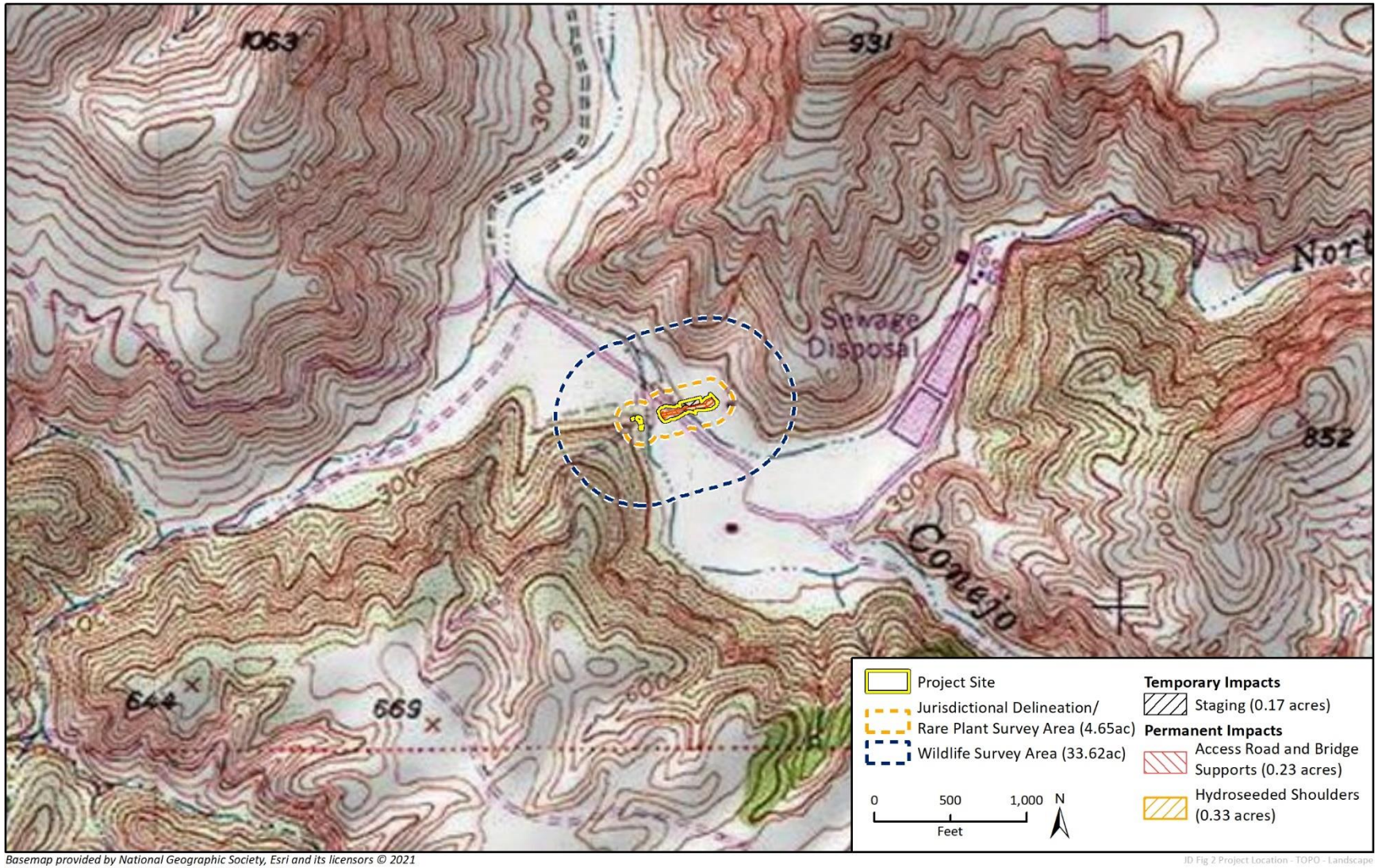


Figure 2 Topographical Project Location



Basemap provided by National Geographic Society, Esri and its licensors © 2021
Additional data provided by City of Thousand Oaks, 2019.

JD Fig 2 Project Location - TOPO - Landscape

Figure 3 NHD and NWI Hydrology

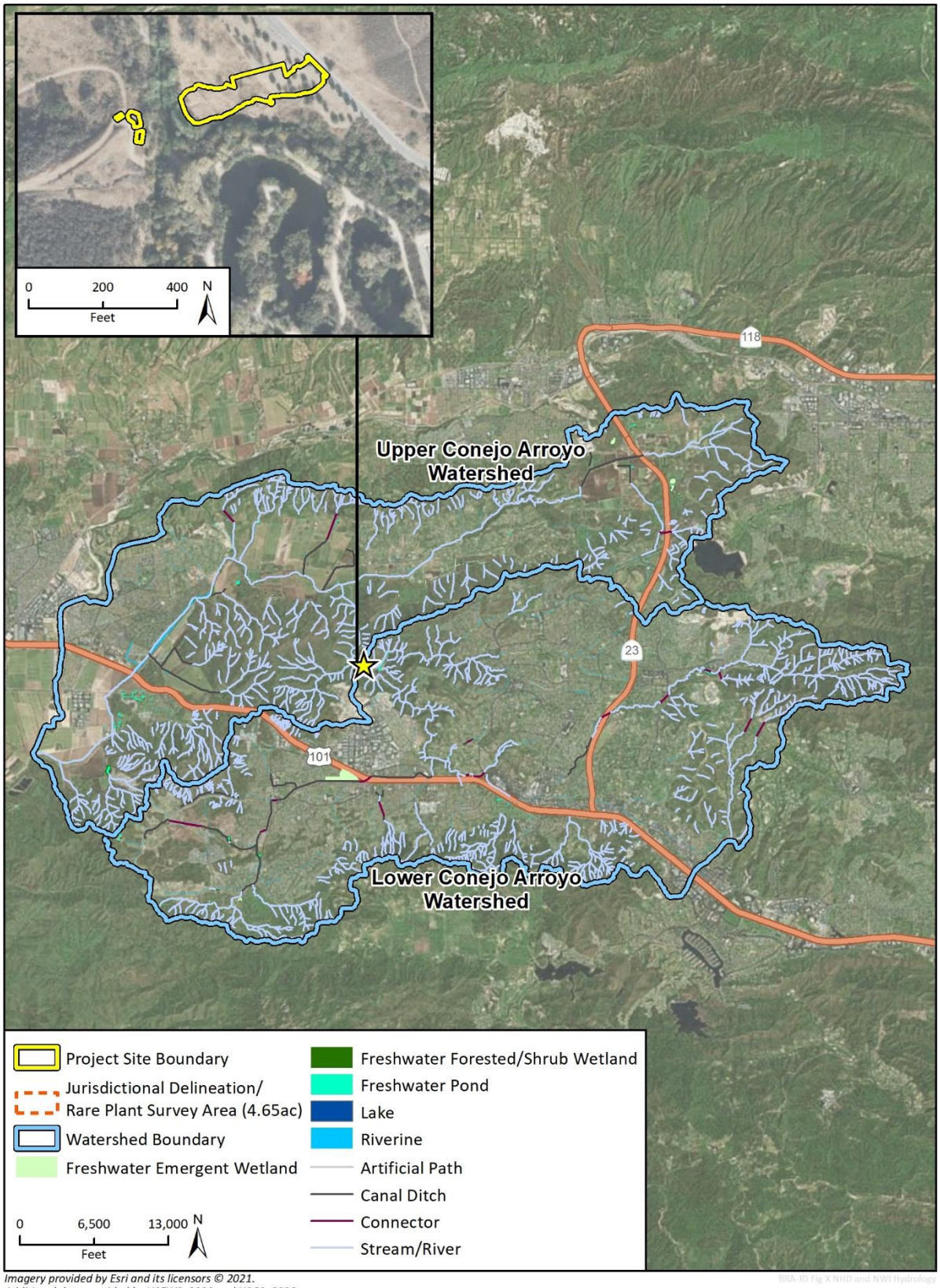
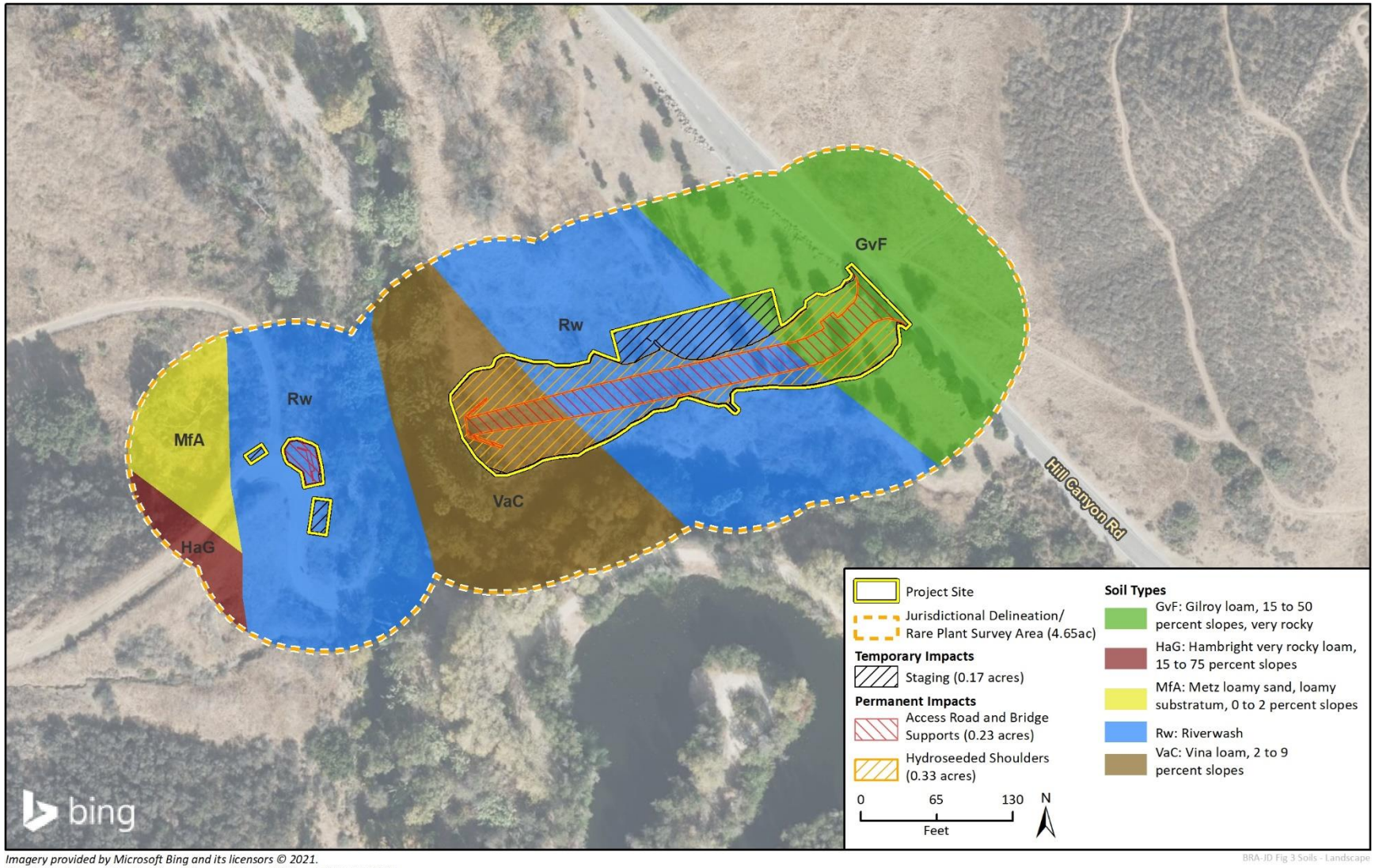


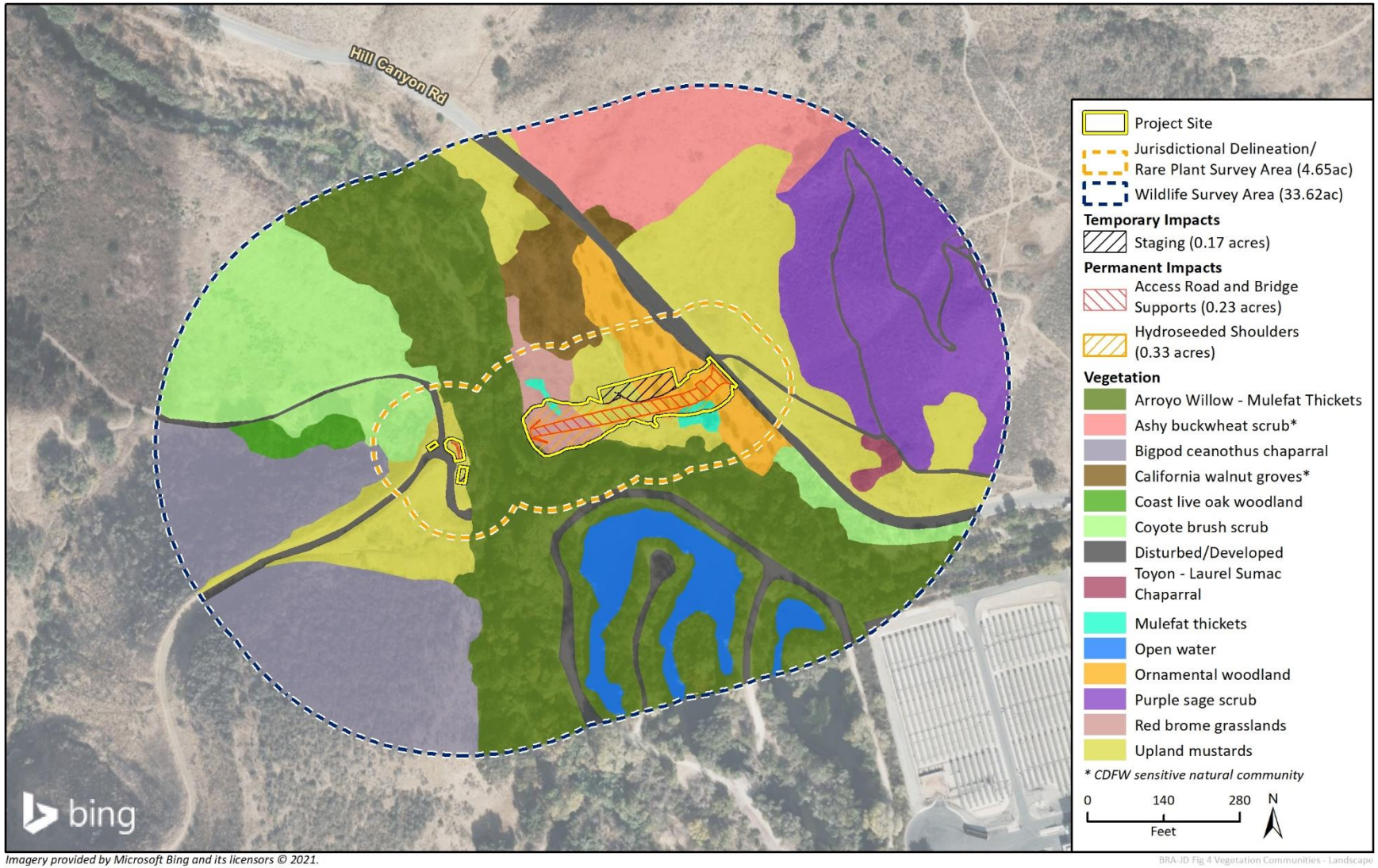
Figure 4 Soils within the JD Survey Area



Imagery provided by Microsoft Bing and its licensors © 2021.
Additional data provided by City of Thousand Oaks, 2019 and SSURGO, 2019.

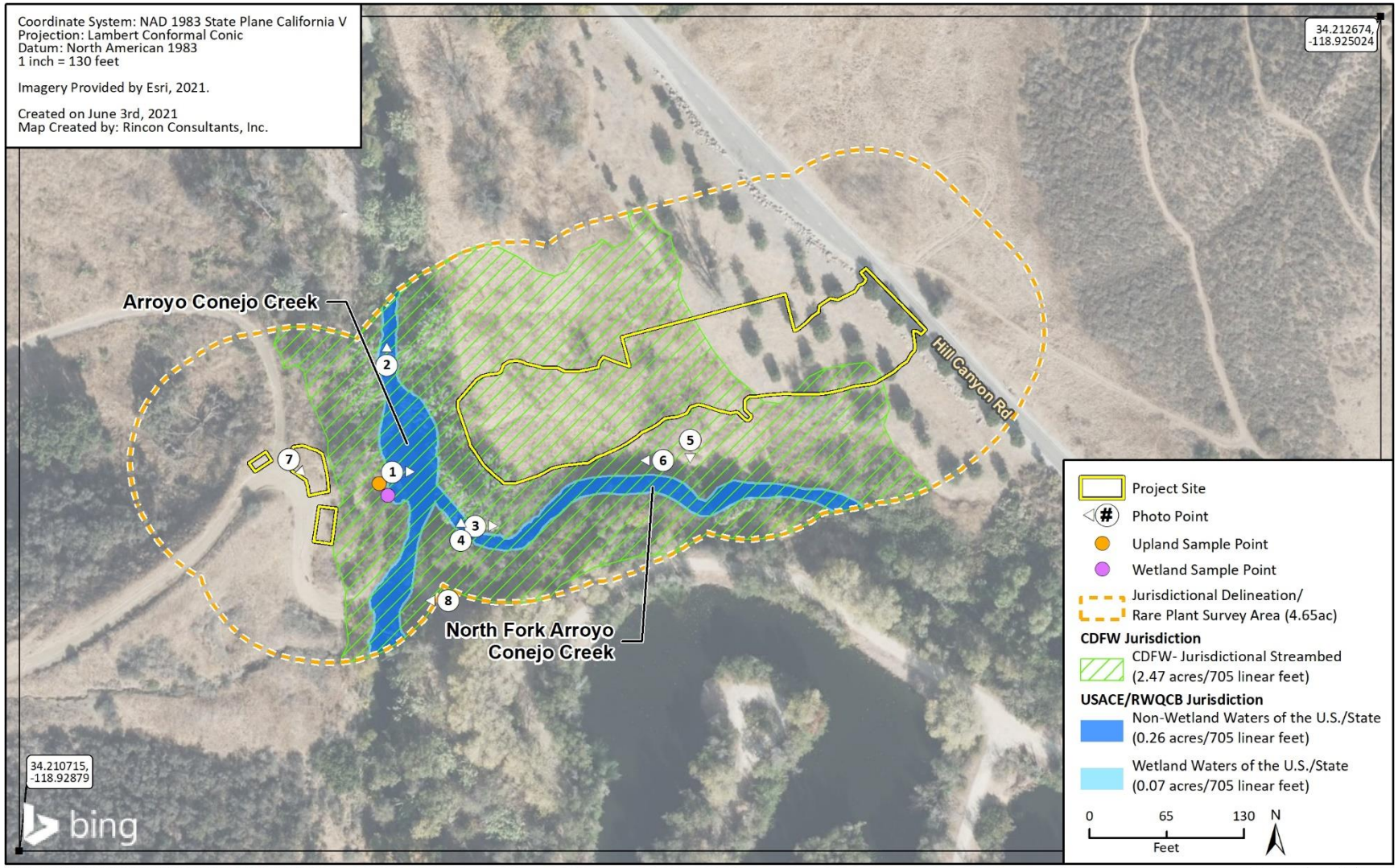
BRA-JD Fig 3 Soils - Landscape

Figure 5 Vegetation within the JD Survey Area



Imagery provided by Microsoft Bing and its licensors © 2021.
Additional data provided by City of Thousand Oaks, 2019.

Figure 6 Jurisdictional Delineation within the JD Survey Area



Imagery provided by Microsoft Bing and its licensors © 2021.
Additional data provided by City of Thousand Oaks, 2019.

Attachment 2

Representative Site Photographs

Photograph 1. Arroyo Conejo with arroyo willow-mulefat thicket riparian corridor, facing east 04/23/2021

Photograph 2. Arroyo Conejo downstream with arroyo willow riparian corridor at edge of JD Survey Area, facing north. 04/23/2020

Photograph 3. Confluence of Arroyo Conejo and North Fork Arroyo Conejo with vegetated gravel bars within the floodplain**,** facing east. 04/23/2021

Photograph 4. North Fork Arroyo Conejo with unvegetated gravel bars within the floodplain, facing north. 04/23/2021

Photograph 5. View of North Fork Arroyo Conejo with upland mustard vegetation upslope, facing south. 04/23/2021

Photograph 6. View of arroyo willow-mulefat thicket riparian corridor along North Fork Arroyo Conejo where it transitions to upland mustard vegetation, facing west. 04/23/2021

Photograph 7. Western portion edge of the arroyo willow-mulefat thicket riparian corridor associated with Arroyo Conejo, facing southeast. 04/23/2021

Photograph 8. Access roadway crossing Arroyo Conejo upstream of confluence with North Fork Arroyo Conejo, facing west. 04/23/2021

Attachment 3

Table 2. Plants Observed within Survey Area

Table 3. Wetland Summary

Wetland Determination Data Forms

Ordinary High Water Mark Data Forms

Table 2. Plant Species Observed Within the Survey Area on April 21, 2021

Scientific Name	Common Name	Wetland Indicator Status	Native or Introduced
Plants			
Trees			
Fraxinus sp.	Ash	-	
Juglans californica	Southern California black walnut	FACU	Native
Platanus racemosa	Western sycamore	FAC	Native
Populus fremontii	Fremont cottonwood	-	Native
Quercus agrifolia	coast live oak	-	Native
Quercus virginiana	Southern live oak	FACU	Native
Salix exigua	Sandbar willow	FACW	Native
Salix lasiolepis	Arroyo willow	FACW	Native
Washingtonia robusta	Mexican fan palm	FACW	Introduced; Cal-IPC Moderate
Shrubs			
Acmispon glaber	deerweed	-	Native
Ambrosia psilostachya	ragweed	FACU	Native
Artemisia californica	California sagebrush	-	Native
Baccharis pilularis	coyote brush	-	Native
Baccharis salicifolia ssp. *salicifolia*	mulefat	FAC	Native
Eriogonum cinereum	coastal buckwheat	-	Native
Eriogonum elongatum var. *elongatum*	long stemmed buckwheat	-	Native
Eriogonum fasciculatum	California buckwheat	-	Native
Hesperoyucca whipplei	chaparral yucca	-	Native
Heteromeles arbutifolia	toyon	-	Native
Nicotina glauca	tree tobacco	FAC	Introduced; Cal-IPC Moderate
Opuntia littoralis	coast prickly pear	-	Native
Rhus ovata	lemonade berry	-	Native
Rosa californica	California wild rose	FACU	Native
Salsola tragus	Russian thistle	FACU	Introduced, Cal-IPC Limited
Salvia leucophylla	purple sage	-	Native
Salvia mellifera	black sage	-	Native
Sambucus nigra ssp. *caerulea*	blue elderberry	FACU	Native
Herbs			
Artemisia douglasiana	mugwort	FAC	Native
Brassica nigra	black mustard	-	Introduced; Cal-IPC Moderate
Calystegia macrostegia	island morning glory	-	Native
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	-	Introduced

Scientific Name	Common Name	Wetland Indicator Status	Native or Introduced
Chenopodium californicum	California goosefoot	-	Native
Conium maculatum	poison hemlock	-	Introduced; Cal-IPC Moderate
Cuscuta sp.	dodder	-	Native
Datura wrightii	jimsonweed	UPL	Native
Encelia californica	California bush sunflower	-	Native
Foeniculum vulgare	fennel	-	Introduced; Cal-IPC Moderate
Galium aparine	bedstraw	FACU	Native
Hirschfeldia incana	shortpod mustard	-	Introduced, Cal-IPC Moderate
Marah macrocarpa	man-root	-	Native
Marrubium vulgare	white horehound	FACU	Introduced, Cal-IPC Limited
Malacothrix saxatilis	cliff aster	-	Native
Nasturtium officinale	watercress	OBL	Native
Phacelia sp.	phacelia	-	Native
Ricinus communis	castor bean	FACU	Introduced; Cal-IPC Limited
Sisymbrium irio	London rocket	-	Introduced, Cal-IPC Moderate
Solanum douglasii	Douglas' nightshade	FAC	Native
Toxicodendron diversiloum	poison oak	FACU	Native
Urtica dioica	stinging nettle	FAC	Native
Urtica urens	annual stinging nettle	-	Introduced
Grasses			
Arundo donax	giant reed	FACW	Introduced, Cal-IPC High
Bromus diandrus	ripgut brome	-	Introduced; Cal-IPC Moderate
Bromus madritensis ssp. *rubens*	red brome	UPL	Introduced, Cal-IPC High
Cyperus involucratus	umbrella plant	FACW	Introduced
Elymus condensatus	giant wild rye	FACU	Native
Elymus triticoides	beardless wild rye	FAC	Native
Hordeum murinum	foxtail barley	FACU	Introduced; Cal-IPC Moderate

[1] Listed on the Special Vascular Plants, Bryophytes, and Lichens List (April 2021).

Sources: CRPR (California Rate Plant Rank), Cal-IPC Inventory for Southwest Jepson Region, USACE Arid West Wetland Plant List, 2018.

Table 3. Data Summary by Wetland Feature

Aquatic Resource	Area	Cowardin Class	Wetland Indicator Summary	Latitude	Longitude
Wetland 1	0.07 acres	Palustrine Emergent Wetland (PEM)	▪ Hydrophytic vegetation, primarily *Ambrosia psilostachya, Melitous indicus*, and *Veronica anagallis-aquatica* ▪ Hydric Soils (Problematic Soils; vegetated sand and gravel bar) ▪ Hydrology (A2, A3, B7, B11, B3)	34.211591	-118.927782

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Conejo Canyons Bridge City/County: Thousand Oaks Sampling Date: 4/30/21
Applicant/Owner: COSCA State: CA Sampling Point: [redacted]1
Investigator(s): Carolyn Welch, Robin Murray Section, Township, Range: T2N R20W
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): 2
Subregion (LRR): C Lat: 34.211599 Long: -118.927792 Datum: NAD83
Soil Map Unit Name: Riverwash NWI classification: Perennial stream
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____
Are Vegetation ____, Soil ✓, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:
Sample point directly adjacent to ordinary high water mark within perennial stream.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	5	Y	FACW
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Baccharis salicifolia	15	Y	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Ambrosia psilostachya	15	Y	FACU
2. Melilotus indicus	10	Y	FACU
3. Veronica anagallis-aquatica	8	Y	OBL
4. Bromus diandrus	5	N	UPL
5. Festuca perennis	2	N	FAC
6.			
7.			
8.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. —			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:
Obligate wetland plants limited to 2.5' strip directly adjacent to active channel and OHWM.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR3/1	100	—				loamy sand	
4-6	N/A						coarse sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ✓ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: dense cobbles

Depth (inches): 6"

Hydric Soil Present? Yes ✓ No ___

Remarks:

Very little organic matter present. Shovel refusal at 6", cobbles encountered. Presumed hydric due to naturally problematic soils. Sample point is in a vegetated sand or gravel bar within a floodplain.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0-6"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil pit rapidly inundated after excavation, drift deposits observed up to 10' above water surface.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Conejo Canyons Ridge City/County: Thousand Oaks Sampling Date: 4/30/21
Applicant/Owner: COSCA State: CA Sampling Point: 2
Investigator(s): Carolyn Welch, Robin Murray Section, Township, Range: T 2N R20W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 2
Subregion (LRR): C Lat: 34.21577 Long: -118.927812 Datum: NAD83
Soil Map Unit Name: Riverwash NWI classification: perennial stream
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ✓, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No ✓
Hydric Soil Present? Yes ____ No ____
Wetland Hydrology Present? Yes ____ No ____
Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Washingtonia robusta	1	Y	FACW
2.			
3.			
4.			
	1	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Baccharis salicifolia	15	Y	FAC
2. Salix lasiolepis	8	Y	FACW
3. Callistemon citrinus	2	N	UPL
4.			
5.			
	25	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Bromus diandrus	15	Y	UPL
2. Brassica nigra	12	Y	UPL
3. Foeniculum vulgare	9	Y	UPL
4. Bromus rubens	5	N	UPL
5. Ambrosia psilostachya	1	N	FACW
6. Cirsium vulgare	1	N	FACU
7. Stipa miliacea	1	N	UPL
8.			
	44	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. —			
2.			
	—	= Total Cover	

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	9	x 2 =	18
FAC species	15	x 3 =	45
FACU species	2	x 4 =	8
UPL species	44	x 5 =	220
Column Totals:	70 (A)		291 (B)

Prevalence Index = B/A = 4.2

Hydrophytic Vegetation Indicators:
__ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:
Sample point taken between top of bank and strip of hydrophyte vegetation adjacent to OHWM (sampled as pt 1)

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	100	———				Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: cobbles

Depth (inches): 12"

Hydric Soil Present? Yes ___ No ✓

Remarks:

Shovel refusal at 12". Much more organic matter and finer mineral soils than SP1. No evidence of extended inundation observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Low frequency flooding events likely at this sample point as evidenced by drift deposits. No other evidence of regular inundation observed.

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Canejo Canyon Bridge | **Date:** 4/30/21 | **Time:** 1340
Project Number: | **Town:** | **State:** CA
Stream: | **Photo begin file#:** | **Photo end file#:**
Investigator(s): C. Welch, R. Murray

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:

Projection: **Datum:**
Coordinates: 34.211599, -118.927792

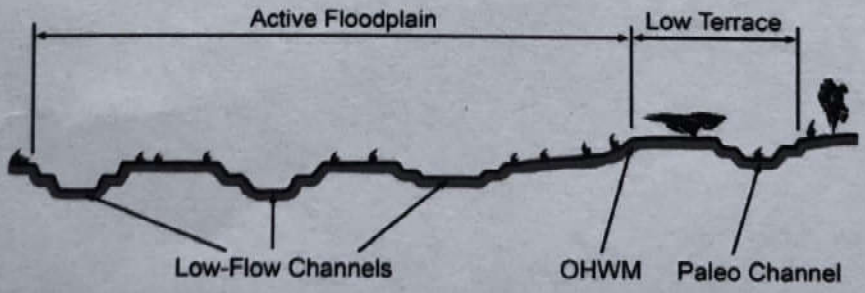
Potential anthropogenic influences on the channel system:
Nearby trails (hiking, biking, dogs), treatment plant upstream, road to east

Brief site description:
Perennial drainage, just downstream of confluence of Arroyo Canejo and North Fork Arroyo Canejo

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

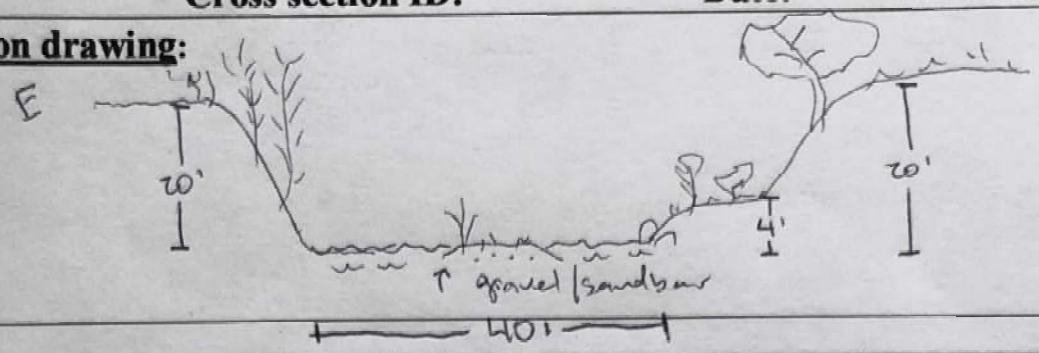


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☒ GPS
   - ☐ Other:

Project ID: **Cross section ID:** **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: _____

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☒ Other: surface water
- ☐ Other: _____

Comments:

OHWM generally defined by edge of surface water

Floodplain unit: ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: fine to coarse silt

Total veg cover: 95 % Tree: 0 % Shrub: 40 % Herb: 55 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☒ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☒ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

drift deposits in floodplain ~ 10' above water surface. TOB > OHWM

Attachment 4

Regulatory Framework

Regulatory Framework

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, State, and local levels. A number of federal and State statutes provide a regulatory structure which guide the protection of jurisdictional features. Agencies with the responsibility for protection of jurisdictional features within the project site include:

- United States Army Corps of Engineers (non-wetland waters and wetlands of the United States)
- Regional Water Quality Control Board (waters of the State)
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes)
- California Coastal Commission (coastal wetlands)

United States Army Corps of Engineers Jurisdiction

The United States Army Corps of Engineers (USACE), is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the CWA "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Under provisions of Section 404 of the Clean Water Act (CWA), the USACE regulates the placement of dredge or fill material into "waters of the United States." In administering this program, the USACE must consider factors including the need to minimize impacts while maintaining the applicant's objectives to the extent practicable, and the CWA's requirement that any permitted discharge of fill must be the least environmentally damaging practicable alternative. The process of obtaining a Section 404 permit can be onerous, and may include public noticing and comment, a robust alternatives analysis performed under the U.S. Environmental Protection Agency's (USEPA) Clean Water Act Section 404(b)(1) Guidelines, environmental review under the National Environmental Policy Act, required interagency consultation processes triggered by other federal laws, and costly compensatory mitigation.

To streamline the permitting process for routine types of projects the USACE has determined will have only minimal environmental impacts, the USACE has issued a series of General Permits, including Nationwide Permits (NWPs) issued at the national level and Regional General Permits (RGPs) issued at the regional level. For activities that meet the criteria, qualifying for coverage under a General Permit can be a boon because it eliminates the most complex steps in the permitting process (404(b)(1) analysis and NEPA review).

Waters of the U.S.

On April 21, 2020, the USACE and U.S. Environmental Protection Agency published the *Navigable Waters Protection Rule to define "Waters of the United States."* This rule, effective on June 22, 2020, defines four categories of jurisdictional features, documents certain types of waters that are excluded from jurisdiction, and clarifies some regulatory terms. Under the *Navigable Waters Protection Rule*, "waters of the United States" include:

1. Territorial seas and traditional navigable waters;
2. Perennial and intermittent tributaries that contribute surface flow to those waters;
3. Certain Lakes and ponds, and impoundments of jurisdictional waters, and;
4. Wetlands adjacent to jurisdictional waters.

Tributaries are defined as "a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to the territorial seas or traditional navigable waters in a typical year either directly or through one or more tributaries, jurisdictional lakes, ponds, and impoundments of jurisdictional waters, or adjacent wetlands." The tributary category also includes a ditch that "either relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch is perennial or intermittent and contributes surface water flow to a traditional navigable water or territorial sea in a typical year."

Adjacent wetlands are defined as wetlands that:

(i) Abut, meaning to touch at least at one point or side of, a defined water of the U.S.;

(ii) Are inundated by flooding from a defined water of the U.S in a typical year;

(iii) Are physically separated from a defined water of the U.S. by a natural berm, bank, dune, or similar natural features or by artificial dike, barrier or similar artificial structures as long as direct hydrological surface connection to defined Waters of the U.S. are allowed; or,

(iv) Are physically separated from a defined water of the U.S. only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the defined water of the U.S. in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The Navigable Waters Protection Rule states that the following areas not considered to be jurisdictional features even where they otherwise meet the definitions described above:

1. Groundwater, including groundwater drained through subsurface drainage systems;
2. Ephemeral features that flow only in direct response to precipitation including ephemeral streams, swales, gullies, rills and pools;
3. Diffuse stormwater runoff and directional sheet flow over uplands;
4. Ditches that are not defined Waters of the U.S. and not constructed in adjacent wetlands subject to certain limitations;
5. Prior converted cropland;
6. Artificially irrigated areas that would revert to upland if artificial irrigation ceases;
7. Artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters;
8. Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
9. Stormwater control features constructed or excavated in uplands or in non-jurisdictional water to convey, treat, infiltrate, or stormwater run-off;
10. Groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters; and,
11. Waste treatment systems.

USACE jurisdictional limits are typically identified by the ordinary high water mark (OHWM) or the landward edge of adjacent wetlands (where present). The OHWM is the "line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area" (33 CFR 328.3).

Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). The USACE's delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2018), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

Obligate Wetland (OBL). Almost always occur in wetlands

Facultative Wetland (FACW). Usually occur in wetlands, but occasionally found in non-wetlands

Facultative (FAC). Occur in wetlands or non-wetlands

Facultative Upland (FACU). Usually occur in non-wetlands, but may occur in wetlands

Obligate Upland (UPL). Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g. riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Regional Water Quality Control Board Jurisdiction

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant requests a pre-application meeting with the RWQCB, waits no less than 30 days, and then submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a “reasonable period of time” for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. Under current regulations, once initiated, the reasonable period of time cannot be stopped or paused. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued

it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the state except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or

other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

1. the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;
2. the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and
3. the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

California Department of Fish and Wildlife Jurisdiction

California Fish and Game Code section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of CFGC** establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"

- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM
- **CDFW regulations** defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation
- **Guidance documents**, *including A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife
  - Biologic components of a stream may include aquatic and riparian vegetation, all aquatic animals including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
  - The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

Ventura County Jurisdiction

Ventura County Watershed Protection District, which implements the Flood Plain Management Ordinance 3841 on behalf of Ventura County ensures compliance with the National Flood Insurance Program. This includes review of structures built in the floodplain affecting the bed, banks and overflow areas of District jurisdictional redline channels. The list of redline channels was adopted by the District Board of Supervisors in 1960, and then updated and confirmed by them in 1994. Ventura County defines a redline channel as follows:

- Most of the redline channels convey about 500 cubic feet per second or more in a 100-year runoff event.

Appendix C

Arborist Report

Conejo Canyons Bridge at Hill Canyon Treatment Plant

Arborist Report

prepared by

City of Thousand Oaks
Community Development Department
2100 Thousand Oaks Boulevard
Thousand Oaks, California 91362
Contact: Jessica Magaña, Associate Planner

prepared with the assistance of

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September 2021

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Rincon Consultants, Inc.

2021 *Arborist Report, Conejo Canyons Bridge at the Hill Canyon Treatment Plant (CI 5527) Project.* Rincon Project 21-11191. August 2021.

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1 Introduction

Rincon Consultants, Inc. (Rincon) prepared this report for the Conejo Open Space Conservation Agency (COSCA) for the Conejo Canyons Bridge at the Hill Canyon Treatment Plant (CI 5527) Project (project) located in the city of Thousand Oaks (City).

1.1 Regulatory Context

This report documents the results of a tree survey and the project's impacts to protected trees pursuant to the City's Oak Tree Ordinance and Landmark Tree Ordinance (City's Ordinances) and the City's Oak Tree Preservation and Protection Guidelines (City's Guidelines). Pursuant to the City's Ordinances and Guidelines, an Oak/Landmark Tree Permit is required for removal, relocation, or encroachment into the protected zone of an oak tree or landmark tree. Protected oaks and landmark tree removals are to be mitigated at the discretion of the City as per the City's Ordinances. Protected oak and landmark trees are defined as follows:

- A protected oak tree is any oak tree of the genus *Quercus* including, but not limited to, valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and scrub oak (*Quercus berberidifolia*), which exceeds two inches in diameter when measured at a point four and one-half feet above the natural grade at the base of the tree. For multiple trunk trees, the aggregate total diameter of all trunks shall exceed two inches in diameter.
- A landmark tree is any tree that is a California sycamore (*Platanus racemosa*) which exceeds twelve inches in diameter for a single trunk, a California bay laurel (*Umbellularia californica*) which exceeds eight inches in diameter, a California black walnut (*Juglans californica*) which exceeds eight inches in diameter, or a toyon (*Heteromeles arbutifolia*) which exceeds eight inches in diameter. For multiple trunk trees, the sum of the diameters of all trunks must exceed the required diameters listed above plus two inches. Landmark trees shall also include all City designated historic trees.

The City defines the tree protection zone (TPZ) of protected trees as the dripline plus five feet, or 15 feet from the trunk, whichever is greater.

1.2 Project Description

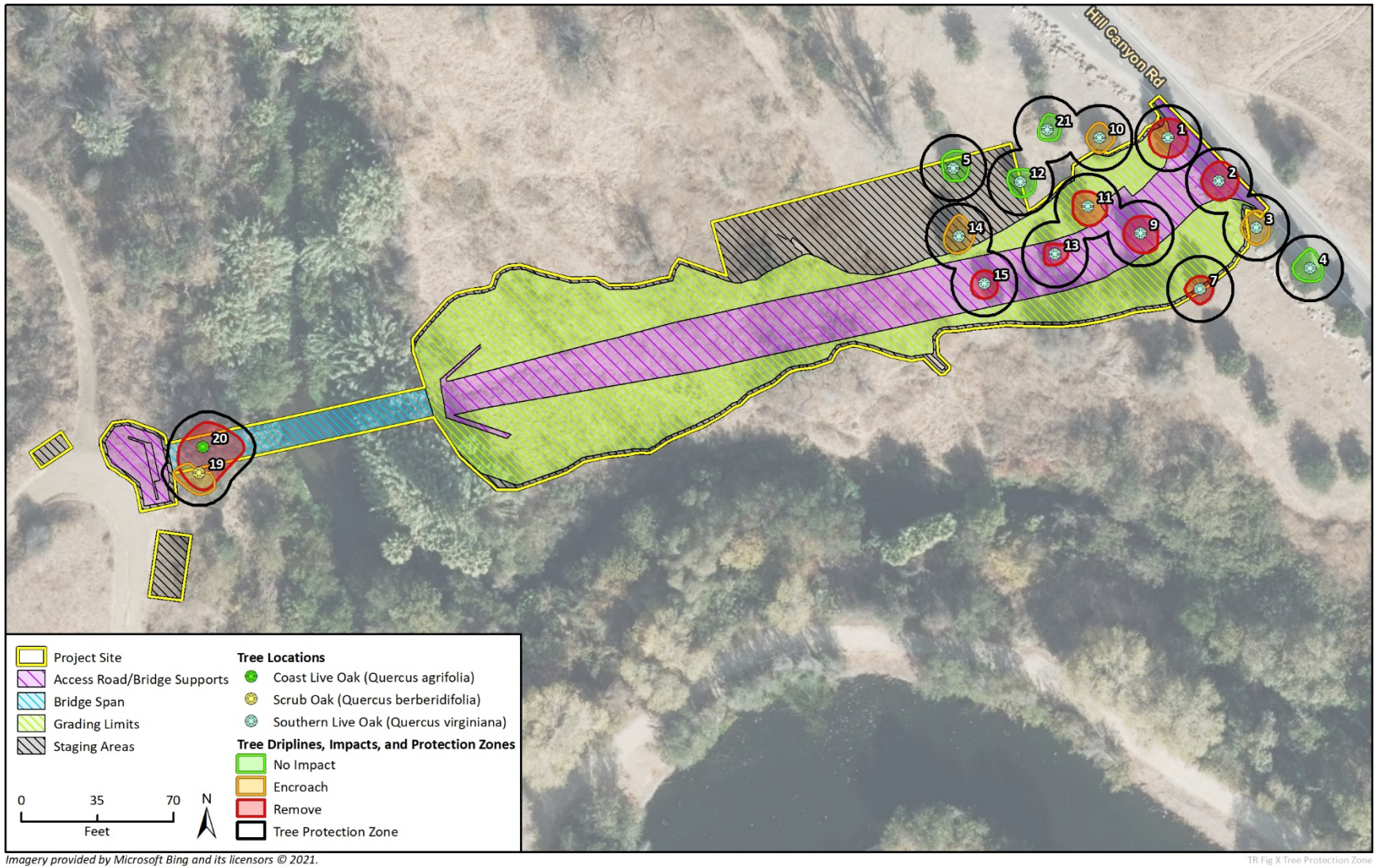
The project is located in an undeveloped portion of Hill Canyon comprising native, non-native, and ornamental vegetation. Trees present in the project site include native coast live oaks (*Quercus agrifolia*), scrub oaks (*Quercus berberidifolia*), arroyo willow (*Salix lasiolepis*), and elderberry (*Sambucus nigra*); and planted southern live oaks (*Quercus virginiana*) and Mexican fan palm (*Washingtonia robusta*). The project comprises a new bridge spanning Arroyo Conejo Creek and an associated access road connecting to the eastern side of the new bridge and Hill Canyon Road. The bridge and new access road would provide several benefits to the City, COSCA, and the public. The bridge was identified in COSCA's Conejo Canyons Management Plan as a high priority open space amenity for improving public and emergency access (COSCA 2010). The bridge would connect existing trails on either side of the creek and would provide a key link in the trail system between the Conejo Canyons and Wildwood open space areas. It would provide trail users (e.g., hikers, mountain bikers, and equestrians) safe access between Wildwood Park and Conejo Canyons by

allowing them to remain on the existing Hill Canyon trail and Arroyo Conejo trail rather than utilizing Hill Canyon Road, which was not designed to accommodate such trail users. Additionally, the bridge would provide COSCA Park Rangers better accessibility to open space areas in support of maintenance and resource management. It would also provide a direct route for City Public Works vehicles between the City's Municipal Services Center and Hill Canyon Treatment Plant.

Based on the current project plans, the bridge is proposed as a 140 feet long single-span design between two supports, as shown in Figure 1. The supports would be anchored on either end with no supports in the middle and positioned at the top of the stream banks to avoid intrusion into the channel. The bridge would be secured to concrete abutments on either side of the creek. The western end of the bridge would tie into the existing Hill Canyon Fire Road. The eastern end of the bridge would connect to Hill Canyon Road by a 375-foot-long section of new access road that will be 12 to 20 feet wide, with 4-inch-thick asphalt concrete, underlain with 10 inches of Class 2 aggregate base. The top approximately 36 inches of native soil would be removed and recompacted to accommodate the new road section, and approximately 3,000 cubic yards of imported fill would be applied. The bridge would be manufactured off-site and installed using a crane to lower it into place. The eastern abutments would utilize 24-inch cast-in-drilled-hole piles, while the western abutments would be anchored into bedrock.

The project may impact protected trees within the bridge span that are taller than the vertical clearance beneath the bridge; as well as trees within the staging areas, access road and bridge support footprint, and grading limits.

Figure 1 Site Plan and Protected Trees



Imagery provided by Microsoft Bing and its licensors © 2021.
Additional data provided by City of Thousand Oaks, 2019.

2 Oak and Landmark Tree Survey Methodology

2.1 Tree Survey Methods

The tree survey was conducted by ISA Certified Arborist Yuling Huo (#WE-11975A) on June 9, 2021. The survey was conducted in accordance with the City's Ordinances and Guidelines. All protected trees with the potential to be impacted by the project site (with at least a portion of their TPZs overlapping project components) were surveyed. Tree #s 4 and 21 are located outside of the project site but have been included in this report for reference. Tree locations were recorded using a Geode global positioning system (GPS) device. All surveyed trees were assigned a unique identification number with a corresponding physical tag affixed to the north side of the tree at 4.5 feet above natural grade, except where inaccessible due to physical barriers (i.e., poison oak). Appendix A summarizes the data for all protected trees. A photograph of each tree is provided in Appendix B – Stantec Arborist Report. The following data was collected on each protected tree:

Physical Characteristics

- Diameter of all trunks – measured at 4.5 ft. above natural grade using a forester's diameter tape
- Crown clearance and spread – measured in eight cardinal directions at points equidistant around the circumference of the tree
- Height – estimated at an appropriate distance from the tree
- Structure – excessive horizontal branching, unbalanced crown, broken branches, etc.
- Appearance rating – A-E scale summarized in Table 1 below based on the Guidelines

Horticultural Evaluation

- Physical evidence of disease, exfoliation, leaf scorch, exudations, etc.
- Identification of pests, twig girdlers, borers, termites, pit scale, plant parasites, etc.
- Evaluation of tree's vigor – new tip growth, good leaf color, poor leaf color, abnormal bark, deadwood, thinning of crown; and recommended mitigation measures necessary to correct any problems.

Table 1 Appearance Rating

Rating	Health Condition
A – Outstanding	A healthy and vigorous tree characteristic of its species and free of any visible signs of disease or pest infestation.
B – Above Average	A healthy and vigorous tree. However, there are minor visible signs of disease and pest infestation
C – Average	Although healthy in overall appearance, there is a normal amount of disease and /or pest infestation
D – Below Average/Poor	This tree is characterized by exhibiting a greater degree of disease and /or pest infestation than normal and appears to be in a state of decline. This tree also exhibits extensive signs of dieback.
E – Dead	This tree exhibits no signs of life whatsoever.

2.2 Tree Mapping Methods

All protected trees surveyed were mapped in ArcGIS and overlain onto the current project site plan) in a computer-aided design (CAD) file. The trunk location is based on the GPS waypoint location that was recorded by the arborist from one side of the tree's trunk. Driplines were based on estimated crown spread collected at eight cardinal directions, as described above. Each tree trunk, dripline, tree protection zone, and identification number are shown in Figure 1.

3 Oak and Landmark Tree Survey Results and Discussion

Sixteen protected trees were surveyed (Figure 1). Appendix A – Protected Tree Matrix provides the data collected and detailed notes for each protected tree. Of the 16 protected trees, one is a coast live oak, 14 are southern live oaks, and one is a scrub oak. 14 trees have a health rating of B (Above Average), one tree has a rating of C (Average), and one tree has a rating of D (Below Average/Poor) as summarized in Table 2 and Table 3 below. No designated historic trees were present within the project site, per the City's Conservation Element (City 2013).

Table 2 Appearance Rating Summary

	A (Excellent)	B (Average)	C (Fair)	D (Poor)	F (Dead/Dying)
Number of trees	0	14	1	1	0

Table 3 Species Summary

	Coast Live Oak	Southern Live Oak	Scrub Oak
Number of trees	1	14	1

The protected trees that were surveyed are located within landscaped and natural areas adjacent to either bank of the Arroyo Conejo. The southern live oaks were planted and are growing within a landscaped area of the project site adjacent to Hill Canyon Road in disturbed, non-native vegetation. These trees retain some natural leaf litter and are irrigated.

The coast live oak and scrub oak are growing in a natural area on the upland slope west of Arroyo Conejo in native vegetation. These two trees were burned during the 2018 Hill Fire and exhibit charred bark and/or cavities. Tree 20 (coast live oak) has a large cavity in the trunk and many dead branches; however, the tree exhibits new growth, is downslope from hiking trails, and does not currently pose a hazard to people.

Please note that the identification numbers in the Stantec Arborist Report Tree Location Map (Appendix B, Figure 2) did not match the physical tags for five trees; these trees have been relabeled in this report with the corresponding physical tag: Tree 7 (Stantec Tree 5), Tree 9 (Stantec Tree 7), Tree 11 (Stantec Tree 9), Tree 12 (Stantec Tree 11), and Tree 5 (Stantec Tree 12).

4 Tree Impacts

Of the 16 protected trees, eight trees are proposed to be removed, trees are expected to have up to 15% of their TPZs impacted by the project, and four trees are not anticipated to be impacted or encroached upon as shown in Table 4 below and Appendix A. Two elderberries may need be removed and are not considered protected trees.

Table 4 Impact Type

Tree ID #	Species	Aggregate Trunk Diameter (inches)	Proposed TPZ Impact Status	Proposed TPZ Impact Percentage
1	southern live oak (*Quercus virginiana*)	8	Remove	100%, entire TPZ within grading limits
2	southern live oak (*Quercus virginiana*)	7	Remove	100%, entire TPZ within grading limits
3	southern live oak (*Quercus virginiana*)	6	Encroach	15%, TPZ within grading limits
4	southern live oak (*Quercus virginiana*)	7	No Impact	None, outside project site
5	southern live oak (*Quercus virginiana*)	5	No Impact	None, TPZ in staging area will be completely avoided
7	southern live oak (*Quercus virginiana*)	6	Remove	100%, trunk within grading limits
9	southern live oak (*Quercus virginiana*)	5.5	Remove	100%, entire TPZ within grading limits
10	southern live oak (*Quercus virginiana*)	6	Encroach	15%, TPZ within grading limits
11	southern live oak (*Quercus virginiana*)	7	Remove	100%, entire TPZ within grading limits
12	southern live oak (*Quercus virginiana*)	6	No Impact	None, TPZ in staging area will be completely avoided
13	southern live oak (*Quercus virginiana*)	4.5	Remove	100%, entire TPZ within grading limits
14	southern live oak (*Quercus virginiana*)	5	Encroach	15%, TPZ within grading limits; TPZ in staging area will be completely avoided
15	southern live oak (*Quercus virginiana*)	5	Remove	100%, entire TPZ within grading limits
19	scrub oak (*Quercus berberidifolia*)	15	Encroach	5%, TPZ within bridge span but may not be impacted if tree is shorter than vertical clearance of bridge
20	coast live oak (*Quercus agrifolia*)	21	Remove	100%, entire TPZ within bridge span and tree is taller than vertical clearance of bridge
21	southern live oak (*Quercus virginiana*)	6	No Impact	None, TPZ outside project site

Estimated impact percentages are based on location data collected during the tree survey overlain onto the project plans. As previously stated, project areas with the potential to impact protected trees include the staging areas, bridge span, access road/bridge supports, and grading limits. Eight trees will be removed as they are within the limits of grading, bridge supports, and/or the bridge span. This includes Tree 20, which is in the path of the bridge span and exceeds the vertical clearance under the bridge. Four trees have at least a portion of their TPZs within the project site but have trunks located outside of the grading limits and bridge span; these trees are anticipated to be impacted less than 15%. Impacts to protected trees are anticipated to be limited to trimming of branches in the crown, possible soil compaction, and/or severing of roots. Impact percentages are calculated based on anticipated cumulative impacts to protected tree crown and root systems. Four trees are not anticipated to be impacted and will be protected in place to the full extent of their TPZs. TPZs within the staging area will be fully protected by fencing and measures proposed in the Tree Protection Plan.

Root systems vary by depth and the lateral extent based on tree species, age, slope, and soil type. Typically, tree roots are less abundant in paved areas and access roads due to the compacted nature of the soil. In addition, trees that are leaning typically have roots that extend further in the direction away from the lean. Similarly, trees that are on slopes typically have roots that extend further on the uphill side to anchor the tree. The full root zone may extend two to three times beyond the TPZ or may be smaller if the roots are impeded by physical barriers. Since the exact extent of root systems are unknown, actual impacts will not be known until the time of construction and will depend upon the tree structure and the construction activities (e.g., trench depth and width, need for trimming of crown for equipment clearance, etc.). All the protected trees in the survey area are growing in landscaped or natural areas and are expected to have roots extending the full TPZ or beyond as appropriate for the species/maturity.

Activities that may occur in association this project that could typically affect tree health and mortality when conducted nearby include but are not limited to the following:

- Excavation/trenching—root severance
- Soil compaction (during and post-construction)
- Grading (cut and/or fill)
- Substantial trimming of crown or roots
- Damage to limbs and branches from project equipment collision (mechanical damage)

Due to the nature of grading and trenching, the greatest concern to tree health and mortality associated with the project is root damage. The ISA acknowledges that removing 20-25% of the roots of a tree could result in mortality. Removal of larger roots (particularly lateral or sinker roots and roots greater than two inches in diameter) can severely impact the stability of the tree. However, healthy and young trees may tolerate impacts to as much as 50% of their crown or root system (Sinclair, Lyon, and Johnson 1987). Trees that are relatively large and/or old for the species or already under stress will have lower tolerances.

Adherence to the mitigation measures below would minimize impacts to protected trees that are remaining on site and help prevent impacts to trees that are outside of the project site.

5 Tree Protection Plan

The following measures should be implemented to reduce impacts to protected trees, pursuant to the City's Ordinances and Guidelines. The City's Ordinances do not provide specific standards and requirements for tree protection; as such the standards and requirements from the Guidelines will be applied to both protected oak and landmark trees.

5.1 Pre-Construction

Worker Awareness

All personnel should receive a training/presentation by a certified arborist or qualified personnel under the arborist's direct supervision, about the TPZs prior to working within or adjacent to these areas. The training should include explanation of the importance of TPZ signage and the protocol for working within TPZs, which is discussed below.

5.2 During Construction

Oversight of Impacts to Trees

No person should impact protected trees without oversight by a certified arborist or qualified personnel under the arborist's direct supervision. A daily log will be completed by the arborist that documents all root and branch cuts (size, number, and location) for each tree. In addition, a copy of this report, the protected tree location map, and the approved City of Thousand Oaks permit, should be on site at all times.

Fencing/Signage

A minimum 5-foot-high new chain link fence or approved material (e.g., orange snow fence) shall be installed at the outermost edge of the TPZ of each oak tree or group of trees that are immediately adjacent to construction. Exceptions may occur in cases where oak trees are located on slopes that would be avoided. However, approval must be obtained from the Community Development Department to omit fences around protected trees. The fencing shall be installed and then inspected by the Community Development Department prior to the start of grading operations. Additionally, signs should be installed at four locations equidistant around each tree; around a grove of trees, signs shall be placed at approximately 50-foot intervals. The size of each sign must be two (2') feet by two (2') feet in size. The signs shall indicate "WARNING. This fence shall not be removed or relocated without the written authorization from the Community Development Director" and should remain in place throughout the period of construction.

Setback Requirements

A minimum 15-foot setback from the trunk of an oak tree shall be maintained at all times. No encroachments, unless otherwise exempt in Title 5, Chapter 14 of the Municipal Code, shall be permitted to occur closer than 15 feet away from the trunk of a tree. Any deviation from a 15-foot setback shall be approved by the Community Development Department.

Grading/Excavation/Trenching

Where potholing, trenching, or any other ground disturbing activity occurs and/or is specifically shown on the project plans within a tree's TPZ, the activity should be done slowly so that when roots are encountered, they are not ripped or damaged by equipment. Hand tools or small hand-held power equipment should be utilized, as feasible. Any subsurface work that must be conducted by mechanical equipment shall be directly monitored by a certified arborist. Cutting roots one inch in diameter or greater should be avoided wherever possible.

Root Severance

When root cutting occurs, exposed major roots that are greater than one inch in diameter (per the Guidelines) should not be ripped by construction equipment and should be preserved to the extent feasible. If roots greater than one inch are required to be cut to allow for construction, cuts should be clean and made at right angles to the roots. New cuts should be covered with absorbent tarp or heavy cloth fabric.

Where structural footings are required and roots will be impacted, the footing(s) shall be bridged and the roots protected. Cover all such roots with a layer of plastic cloth and 2 to 4 inches of Styrofoam matting or other protective measure as approved by permit, prior to pouring the footing.

Pruning/Trimming

All pruning/trimming should be performed consistent with the ANSI A300 Pruning Standard (ANSI 2017) and should adhere to the most recent edition of ANSI Z133.1. Pruning/trimming of protected trees will be limited to only what is necessary for construction. Climbing spurs and spikes should not be used, except in cases of emergency.

Soil Compaction

Soil compaction imposes a complex set of physical, chemical, and biological constraints on tree growth. Principal components leading to limited growth are the loss of aeration and pore space, poor gas exchange with the atmosphere, lack of available water, and mechanical impedance of root growth. Soil compaction is the largest single factor responsible for the decline of trees on construction sites. The following guidelines are recommended to protect trees from soil compaction that may occur due to project activities:

- No equipment or materials will be stored under canopies, or within the TPZ of protected trees. On-site staging, storage and washing of construction materials and equipment will be limited to designated and approved areas. In areas where vehicles or equipment may impact tree roots, steel plates or plywood should be installed to protect sensitive root zones as needed.

Exhaust Exposure

Equipment should limit or avoid travel within TPZs (under tree canopies) to reduce impacts from equipment exhaust exposure. If equipment must operate within TPZs, the exhaust should be directed away from the foliage of protected trees, as feasible. When equipment is operating within TPZs, a certified arborist should monitor and document the activity.

Mechanical Damage

Damage to limbs and branches from project equipment (mechanical damage) may occur if work, including staging and access, occurs within TPZs. If damage occurs to limbs and branches, immediate trimming with clean cuts should occur in accordance with the ANSI standards discussed above. If damage to the bark or trunk occurs, wound dressings are not recommended. Treatment of said damages may be applied in accordance with the ANSI A300 Management of Trees and Shrubs during Site Planning, Site Development, and Construction (ANSI 2012). A certified arborist or qualified personnel under the arborist's direct supervision should monitor and document this activity.

New Plants in Protected Zone

Although it is best not to allow any plants within the protected zone, only drought tolerant plants will be permitted. If landscaping is proposed and such plants are installed, no spray-type irrigation systems are allowed.

Damage

If a protected tree is damaged[1] during construction to the point where removal is required, or the tree may not survive as determined by a certified arborist and approved by the Community Development Department, replacement may be required as detailed in the Section 5.1.2 below.

5.3 Post-Construction

The Guidelines provide detailed standards and requirements for protected oak removal replacement. If additional protected tree removals are required based on final design plans, then a Protected Tree Replacement and Planting Plan may be needed as an addendum to this report.

Oak Tree Replacement

The Guidelines require the following tree replacement ratios for removed trees for residential, commercial, and industrial properties:

- Dead or Hazardous oaks shall be replaced with one fifteen-gallon oak tree.
- Healthy oaks not exceeding forty-eight (48") inches in diameter shall be replaced with two twenty-four (24") inch box trees and one thirty-six (36") inch or sixty (60") inch box tree.
- Healthy oaks exceeding forty-eight (48") inches in diameter shall be replaced with two twenty-four 24"-inch box trees and either the largest available nursery grown tree or two sixty (60")-inch box trees.

Per the Guidelines, replacement trees will be of the species coast live oak, valley oak, or other oak tree varieties as approved by the Community Development Department. In some cases where it is not possible to obtain nursery grown trees in the sizes required, an equivalent number of large and small container oak trees will be planted in an amount equal to the cost of the larger but unavailable trees.

[1] Damage is defined by the Oak Tree Ordinance as any action which causes injury, death, or disfigurement to a tree (including but not limited to cutting, overwatering, relocation, transplanting, trenching, excavating or paving within the protected zone).

The City plans to replace removed trees at a 1:4 ratio with 24-inch box trees (32 oak trees as mitigation for the eight removed). Approximately 20 trees will be planted adjacent to the newly constructed bridge in an area that has been historically maintained free of vegetation. The remaining 12 trees will be planted within the City at a location to be determined. The majority of removed trees (southern live oaks) are not native to California; and the southern live oaks are growing in disturbed, non-native vegetation that is anticipated to be restored to a native habitat area. Rincon recommends that the replacement trees be coast live oaks to mimic the natural habitat.

Though not required by the City's Ordinances or Guidelines, the City will plant 20 elderberries to replace the two removed elderberries in the habitat restoration areas on either side of the newly constructed bridge access road, in conjunction with mitigation requirements specified by the California Department of Fish and Wildlife.

A summary of the tree replacements is below in Table 5.

Table 5 Tree Replacement Summary

Tree ID# Proposed for Removal	Species	Appearance Rating	Aggregate Trunk Diameter (inches)	# of Replacement Trees	Replacement Tree Size
1	southern live oak	B	6	4	24" box)
2	southern live oak	B	6	4	24" box
7	southern live oak	B	6	4	24" box
9	southern live oak	B	6	4	24" box
11	southern live oak	B	5	4	24" box
13	southern live oak	B	5	4	24" box
15	southern live oak	B	5	4	24" box
20	coast live oak	D	21	4	24" box
Total				**32**	**24" box**

The location of replacement trees shall consider, but not be limited to the following:

- The vegetative character of the surrounding area near the project site
- The number of oak trees which are proposed to be removed in relation to the number of such trees currently existing on the project site
- The probability of long-term success of the replacement oak trees in a healthy condition with no or minimal conflict with the approved construction on the site over time

6 References

American National Standards Institute (ANSI). 2012. Tree, Shrub, and Other Woody Plant Management - Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction)

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Appendix A

Protected Tree Matrix

Tree ID #	Common Name/ Scientific Name	# of Trunks	Individual Trunk Diameters (inches)	Aggregate Trunk Diameter (inches)	Height (feet)	Crown Spread (N, NE, E, SE, S, SW, W, NW)[1]	Crown Clearance (N, NE, E, SE, S, SW, W, NW)[2]	Appearance Rating[3]	Proposed TPZ Impact Status	Proposed TPZ Impact Percentage	Horticultural Evaluation/Notes	Recommended Mitigation/Maintenance
1	southern live oak (*Quercus virginiana*)	1	8	8	20	9, 9, 9, 9, 9, 9, 9, 9	2, 3, 3, 2, 2, 4, 4, 3	B	Remove	100%, entire TPZ within grading limits	irrigated, new growth, previous tag missing	Replace at 1:4
2	southern live oak (*Quercus virginiana*)	1	7	7	20	9, 9, 9, 9, 9, 8, 8, 8	1, 2, 3, 1, 3, 4, 4, 1	B	Remove	100%, entire TPZ within grading limits	previous tag missing	Replace at 1:4
3	southern live oak (*Quercus virginiana*)	1	6	6	20	8, 7, 6, 7, 8, 7, 7, 7	1, 2, 2, 1, 4, 4, 1, 4	B	Encroach	15%, TPZ within grading limits	dead branches at base, previous tag missing	Fence TPZ at edge of construction
4	southern live oak (*Quercus virginiana*)	1	7	7	20	9, 6, 6, 7, 6, 7, 8, 7	1, 3, 2, 3, 1, 3, 4, 3	B	No Impact	None, outside project area	some roots exposed from erosion on slope, previous tag missing	Fence entire TPZ
5	southern live oak (*Quercus virginiana*)	1	5	5	15	8, 9, 7, 7, 6, 6, 5, 7	1, 1, 1, 1, 1, 1, 1	B	No Impact	None, TPZ in staging area will be completely avoided	weeds in root zone	Remove weeds, fence entire TPZ
7	southern live oak (*Quercus virginiana*)	1	6	6	15	6, 6, 6, 6, 7, 6, 7, 6	4, 4, 4, 3, 3, 4, 5, 4	B	Remove	100%, trunk within grading limits	weeds in root zone	Replace at 1:4
9	southern live oak (*Quercus virginiana*)	1	5.5	5.5	15	8, 9, 8, 10, 9, 8, 8, 8	1, 1, 1, 2, 1, 1, 1, 1	B	Remove	100%, entire TPZ within grading limits	sparse foliage at tips but new growth present	Replace at 1:4
10	southern live oak (*Quercus virginiana*)	1	6	6	15	7, 6, 7, 6, 7, 6, 6, 6	1, 1, 1, 1, 1, 1, 1, 1	B	Encroach	15%, TPZ within grading limits. TPZ in staging area will be completely avoided	tree is vigorous	TPZ fencing
11	southern live oak (*Quercus virginiana*)	1	7	7	15	7, 7, 9, 9, 9, 8, 7, 8	4, 3, 4, 4, 3, 3, 2, 3	B	Remove	100%, entire TPZ within grading limits	tree is vigorous	Replace at 1:4
12	southern live oak (*Quercus virginiana*)	1	6	6	15	6, 7, 7, 7, 7, 6, 6, 7	3, 3, 4, 4, 3, 2, 1, 4	B	No Impact	None, TPZ in staging area will be completely avoided	weeds in root zone	remove weeds, fence entire TPZ
13	southern live oak (*Quercus virginiana*)	1	4.5	4.5	10	5, 6, 6, 5, 5, 6, 5, 6	1, 1, 1, 2, 1, 1, 1, 1	B	Remove	100%, entire TPZ within grading limits	weeds in root zone, sparse foliage at tips but new growth emerging	Replace at 1:4
14	southern live oak (*Quercus virginiana*)	1	5	5	15	10, 7, 7, 7, 8, 8, 7, 7	1, 1, 1, 1, 1, 1, 1, 1	B	Encroach	15%, TPZ within grading limits. TPZ in staging area will be completely avoided	weeds in root zone	Remove weeds, fence entire TPZ
15	southern live oak (*Quercus virginiana*)	1	5	5	15	6, 6, 6, 7, 7, 7, 6, 6	1, 1, 1, 1, 2, 2, 2, 3, 2, 2	B	Remove	100%, entire TPZ within grading limits	previous tag missing	Replace at 1:4
19	scrub oak (*Quercus berberidifolia*)	3	9, 5, 1	15	10	1, 1, 5, 10, 10, 9, 12, 6	-, -, 2, 2, 2, 0, 0, 0	D	Encroach	5%, TPZ within bridge span but may not be impacted if tree is shorter than vertical clearance of bridge	north half of crown is dead likely due to fire damage, cracks and burns visible on trunk. Tree was burned during 3018 Hill Fire and exhibits charred bark/cavities	TPZ fencing
20	coast live oak (*Quercus agrifolia*)	1	21	21	25	11, 13, 19, 15, 20, 15, 11, 9	16, 20, 11, 12, 5, 10, 8, 5	C	Remove	100%, entire TPZ within bridge span and tree is taller than vertical clearance of bridge	broken branches on north side, sparse lower canopy, decay, sycamore borer frass on trunk. Tree was burned during 2018 Hill Fire and exhibits charred bark/cavities	Replace at 1:4
21	southern live oak (*Quercus virginiana*)	1	6	6	20	7, 7, 6, 6, 5, 5, 4, 4	4, 3, 4, 4,4 4, 4, 4	B	No Impact	None, TPZ outside project area	weeds in root zone	Remove weeds, TPZ fencing

[1]Crown (leaves and branches) spread in eight cardinal directions at points equidistant around the circumference of the tree.

[2]Crown clearance above natural grade in eight cardinal directions at points equidistant around the circumference of the tree.

[3]A-Outstanding, B-Above Average, C-Average, D-Below Average/Poor, E-Dead

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Appendix B

Stantec Arborist Report

Arborist Report

Conejo Canyons Bridge at HCTP

Report Date

Prepared for:

City of Thousand Oaks
Public Works Department
2100 Thousand Oaks Blvd.
Thousand Oaks, CA 91362

Prepared by:

Stantec Consulting Services Inc.
290 Conejo Ridge Avenue
Thousand Oaks, California 91361

Sign-off Sheet

This arborist report was prepared by Stantec Consulting Services Inc. (Stantec) for City of Thousand Oaks (Client) Conejo Canyons Bridge at HCTP Project. Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Ethan Martin

(signature)

Ethan Martin, Biologist/ISA Certified Arborist #WE-6832A

Independently Reviewed by Michael P. Weber

(signature)

Michael Weber, Principal Scientist

Technically Reviewed and Approved by

(signature)

Jared Varonin, Principal Biologist

Table of Contents

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) conducted a tree survey in support of the Conejo Canyons Bridge at HCTP Project (proposed project). The purpose of the tree survey, led by an International Society of Arboriculture (ISA) certified arborist, was to collect data on the trees present within and adjacent to the project footprint for inclusion in the project planning and design, and to support the issuance of permits/authorizations from the City of Thousand Oaks (City) for the removal/trimming of trees within the project footprint. This report summarizes the information collected during the survey, provides details on the applicable tree ordinances/regulations that apply to the proposed project, and presents proposed mitigation efforts for the replacement of removed trees.

2.0 PROJECT DESCRIPTION

The proposed project is located in the City of Thousand Oaks in Ventura County, California. The proposed project is located in the Newbury Park, California 7.5-minute U.S. Geological Survey quadrangle within a parcel (APN 6670120160) zoned as Open Space (City of Thousand Oaks 2015). The area surveyed encompasses all currently planned project activities and infrastructure along with an approximate 25 foot buffer (Biological Study Area). The Biological Study Area for the arborist survey covers approximately 1.4 acres and is located to the west of the Hill Canyon Wastewater Treatment Plant, between Hill Canyon Fire Road and Rancho Conejo Boulevard (Appendix A, Figure 1).

3.0 REGULATORY REQUIREMENTS

Articles 42 and 43 of Chapter 4 of Title 9 of the City's Municipal Code state that no person shall cut, remove, encroach into the protected zone or relocate any oak tree on any public or private property within the City unless a valid permit has been issued by the City. The City defines an "oak tree" under Municipal Code Section 9-4.4202 as "any oak tree of the Genus Quercus including, but not limited to, Valley Oak (*Quercus lobata*), California Live Oak (*Quercus agrifolia*) and Scrub Oak (*Quercus berberidifolia*), regardless of size."

City of Thousand Oaks Municipal Code Article 42, Oak Tree Preservation and Protection, Section 9-4.4205 states "Trees that do not exceed two (2") inches in diameter when measured at a point four and a half (4.5) feet above trees natural grade" are exempt from municipal code requirements.

Article 43, Landmark Tree Preservation and Protection covers trees that are not oaks, Section 9-4.4302 parts (f) and (g) defines historic and landmark trees. "Historic tree shall mean a tree that because of its historic or cultural significance will be preserved and safeguarded as a symbol of the City's heritage and to the beauty and image of the City of Thousand Oaks. All historic trees shall be designated pursuant to the procedure set forth within this article." A landmark tree is defined as "a tree that because of its size, age, or unique and irreplaceable values to the community preserved and safeguarded as symbolic of the City's heritage, beauty and image." The City Municipal Code lists several tree species as Landmark Trees. The listed trees are California sycamore (*Platanus racemosa*), California bay laurel (*Umbellularia californica*), California black walnut (*Juglans californica*), and California holly (*Heteromeles arbutifolia*).

4.0 METHODS

The tree survey was conducted by Stantec biologist/ISA Certified Arborist Ethan Martin and Staff Biologist Mayra Martinez on May 28, 2019. All trees in the Biological Study Area were inventoried during the survey (Appendix A, Figure 2). Data collected during the arborist survey included tree species, trunk diameter at 4.5 feet off the ground (diameter at breast height [DBH]), and the overall health and structural condition. The trunk locations of all recorded trees were recorded using a Global Positioning System receiver capable of sub-meter accuracy.

Evaluation of the health and structural condition of each tree was observed using the following scale of 1 to 5:

- **5:** A healthy, vigorous tree, reasonably free of disease, with good structure and form typical of the species.
- **4:** A tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
- **3:** A tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that may be mitigated with care.
- **2:** A tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
- **1:** A tree in severe decline, dieback of scaffold branches and or trunk, mostly epicormic growth; extensive structural defects that cannot be abated.

5.0 RESULTS

A total of 21 trees were tagged and 22 mapped in the Biological Study Area. These trees were comprised of six different species which included 1 Mexican fan palm (*Washingtonian robusta*), 2 willow (*Salix* sp.), 3 elderberry (*Sambucus nigra*), 1 scrub oak (*Quercus berberidifolia*), 1 coast live oak (*Quercus agrifolia*), and 14 southern live oak (*Quercus virginiana)*. One of the mapped trees was unable to be measured and tagged because it was surrounded by poison hemlock. The data collected and photographs for each tree can be found in Table 1 below and Appendix B respectively.

Articles 42 and 43 of Chapter 4 of Title 9 of the City's Municipal Code protects oak trees within the City. In total, all 15 of the oak trees mapped within the Biological Study Area are considered ordinance-size (i.e., greater than 2 inches DBH at 4.5 feet above ground; refer to Appendix B for additional information). No exemptions listed in the Municipal Code were found to be applicable to the oak trees within the extent of the proposed grading limits (refer to Figure 2, Appendix A). Therefore, a permit will be required to remove any oaks within and adjacent to the project's construction footprint.

Since the remainder of the mapped/tagged trees are not a species of oak, their removal would not fall under the protection of Article 42 of Chapter 4 of Title 9 of the City's Municipal Code. Article 43 of Chapter 4 of Title 9, parts (f) and (g), of the City's Municipal Code defines historic and landmark trees. No tree mapped within the Biological Study Area meets the definition of historic or landmark trees as presented in the Municipal Code; therefore this category of permit will not be required for the proposed project. An inventory of the tagged trees, including health and DBH is as follows:

Table 1 – Tree Inventory

Tag Number	Common Name	Species	Diameter at Breast Height (in)	General Condition	Notes
1	Southern Live Oak	*Quercus virginiana*	5.89	4	Good structure and scaffolding; minor scorching
2	Southern Live Oak	*Quercus virginiana*	6.05	4	Good structure and scaffolding; minor scorching
3	Southern Live Oak	*Quercus virginiana*	5.73	4	Good structure and scaffolding; minor scorching
4	Southern Live Oak	*Quercus virginiana*	5.41	4	Good structure and scaffolding; minor scorching
5	Southern Live Oak	*Quercus virginiana*	5.41	4	Some branches with included bark[1]
6	Elderberry	*Sambucus nigra*	35.99	3	Poor branch structure, and included bark[1]
7	Southern Live Oak	*Quercus virginiana*	6.05	4	Included bark[1], good branch structure, girdling roots[3]
8	Elderberry	*Sambucus nigra*	28.98	3	Included bark[1], good structure; due to its size/height this elderberry, in its current condition, is considered a large shrub (instead of a tree).
9	Southern Live Oak	*Quercus virginiana*	4.46	3	Poor branch structure, many branches at 90 degrees, included bark[1]
10	Southern Live Oak	*Quercus virginiana*	4.78	4	Rubber tie grown into tree, good structure
11	Southern Live Oak	*Quercus virginiana*	5.73	4	Good branch structure, included bark[1], minor insect damage to the leaves
12	Southern Live Oak	*Quercus virginiana*	4.78	3	Too many branches growing straight up, a lot of branches rubbing together; included bark[1]
13	Southern Live Oak	*Quercus virginiana*	4.78	4	Fire damage, minor scorching, branching structure is moderate, many open spaces
14	Southern Live Oak	*Quercus virginiana*	4.78	5	Good branch structure; some branches rubbing
15	Southern Live Oak	*Quercus virginiana*	4.86	4	Good branch structure; minor scorching by fire, some branches close together, overgrown crown[2]
No Tree Tag	Elderberry	*Sambucs nigra*	Approx. 79.62	3	Declining, overgrown, several cracked branches, surrounded by poison hemlock
16	Mexican Fan Palm	*Washingtonia robusta*	10.19	5	Good health
17	Willow	*Salix* sp.	4.78	1	Declining health, many dead branches, all sprouts from a fallen tree
18	Willow	*Salix* sp.	52.55	2	Declining health, many dead branches, all sprouts from a fallen tree
19	Scrub Oak	*Quercus berberidifolia*	15.29	1	Fire damage, many dead branches, resprouting near base of trunk, new growth at tips of some branches

Tag Number	Common Name	Species	Diameter at Breast Height (in)	General Condition	Notes
20	Coast Live Oak	*Quercus agrifolia*	20.7	1	Boring insect damage, fire damage, major rot, large cavity in trunk
21	Southern Live Oak	*Quercus virginiana*	5.2	4	Good structure and scaffolding; minor scorching

1. Included bark is a place where the bark is turned inward, rather than pushed out.
2. An overgrown crown means the crown may be getting too heavy for the branches to support the weight.
3. Girdling roots are usually the result of a tree being kept in a container for too long and the roots begin to grow in a circular pattern. The result of this can sometimes be that the girdling roots choke off the trunk or another major root as the tree grows older, limiting the flow of nutrients and water.

6.0 RECOMMENDATIONS

There are a total of 10 trees (1 coast live oak, 7 southern live oaks and 2 elderberry) that will need to be removed as part of the project (tree numbers 1-2, 7-10, 13, 15, and 20 as depicted on Figure 2 [Appendix A]) will be removed as they are within the maximum extent of the proposed grading limits. Every oak tree that is removed will need to be replaced as per the City Municipal Code. Although not required per the Municipal Code the removed elderberry will be replaced in conjunction with mitigation requirements specified by the California Department of Fish and Wildlife. As shown on Figure 2 (Appendix A), tree numbers 14 and 19 are just outside the proposed grading/project limits and can be avoided during construction activities; therefore, they are not proposed for removal. Tree number 19 may require pruning of burnt limbs that extend into the proposed project area but the remaining limbs and root structure will remain intact.

For those trees occurring near, but not within, the extent of grading limits a tree protection zone should be set up around tree to protect them from accidental damage to their trunks, roots and canopies while heavy machinery and vehicles are operating in the vicinity. Tree protection zones of approximately eight feet in diameter, starting from the trunk (around the whole tree) and extending out towards the edge of the tree canopy, should be staked and barricaded from the active construction area. The approximate 8 foot diameter zone is based on the average canopy diameter for the trees within the Survey Area and can be adjusted a case by case basis depending on the size and/or species of tree.

For every oak tree that is removed another oak tree will be planted in its place. The City plans to replace the removed trees by planting a total of 32 oak trees as mitigation for the 8 removed. Approximately 20 of these trees will be planted adjacent to the newly constructed bridge in an area that has been historically maintained free of vegetation. The remaining 12 trees will be planted within City property at yet to be determined locations. To compensate for the removal of the 2 elderberries the City has included approximately 20 elderberries into the restoration palette that will be used within areas adjacent to the newly constructed bridge.

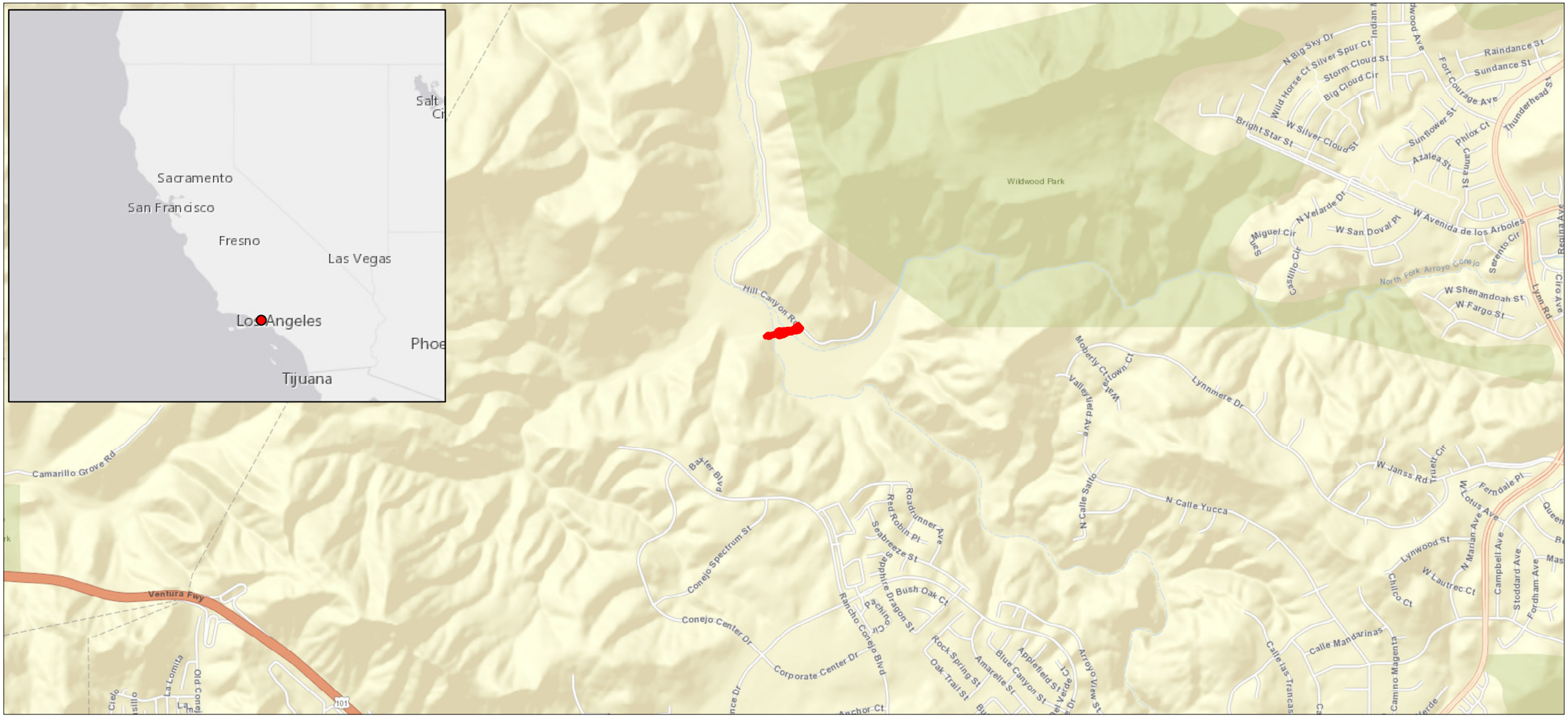
It is recommended that all replacement oak tree stock be 24-inch box trees as this size tree is generally able to establish its roots in a relatively short amount of time. A 24-inch box tree can catch up to and outgrow larger box trees because it takes less time for the smaller tree to establish a new root system if it is in good health.

7.0 REFERENCES

City of Thousand Oaks 1994. Oak Tree Preservation and Protection Standards. Amended January 15, 2016. Accessed online May 29, 2019. https://www.toaks.org/home/showdocument?id=21668

City of Thousand Oaks. 2015. Thousand Oaks General Plan: Land Use and Circulation Elements. Accessed online May 29, 2019. https://www.toaks.org/home/showdocument?id=336

APPENDIX A
Figures



Project Location

0 440 880 metres

(At original document size of 11x17)
1:23,279

N

Stantec

Project Location	Prepared by DL on 2019-05-31
	TR by EM on 2019-06-7
Thousand Oaks, CA	IR Review by JV on 2019-06-13
Client/Project	2064173900

Conejo Canyon Bridge

Figure No.

1

Title

Project Location Map

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Background: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Biological Study Area
Grading Limits (Impact Area)
Design Layout
Scrub Oak
Coast Live Oak
Elderberry
Mexican Fan Palm
Southern Live Oak
Willow
Elderberry (no tag)
Trees Proposed for Removal

0 10 20 metres
(At original document size of 11x17)
1:600

N

Stantec

Project Location
Thousand Oaks, CA

Prepared by JV on 2019-07-01
TR by EM on 2019-07-01
IR Review by JV on 2019-07-01

Client/Project
2064173900

Conejo Canyon Bridge

Figure No.
2

Title
Tree Location Map

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

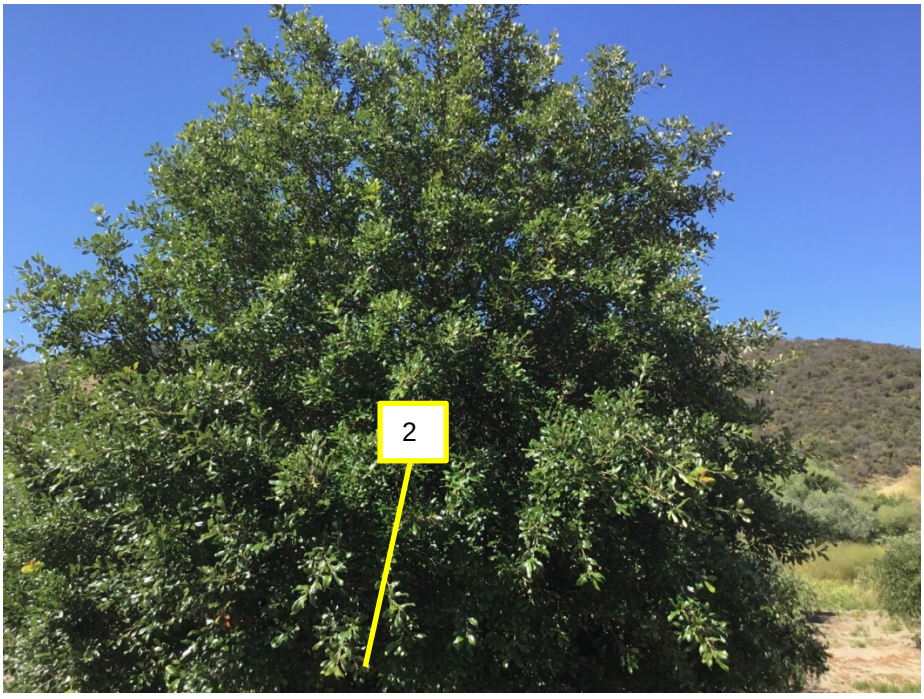
APPENDIX B

Photographic Log

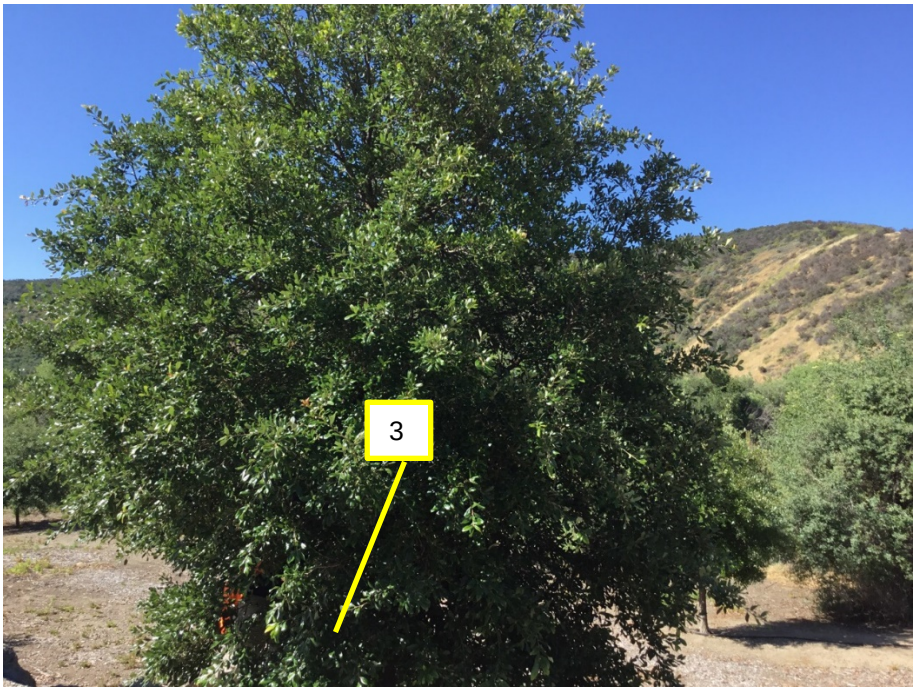
Photographs of Conejo Canyons Bridge at HCTP Project Tree Survey

Photographs Taken May 28. 2019

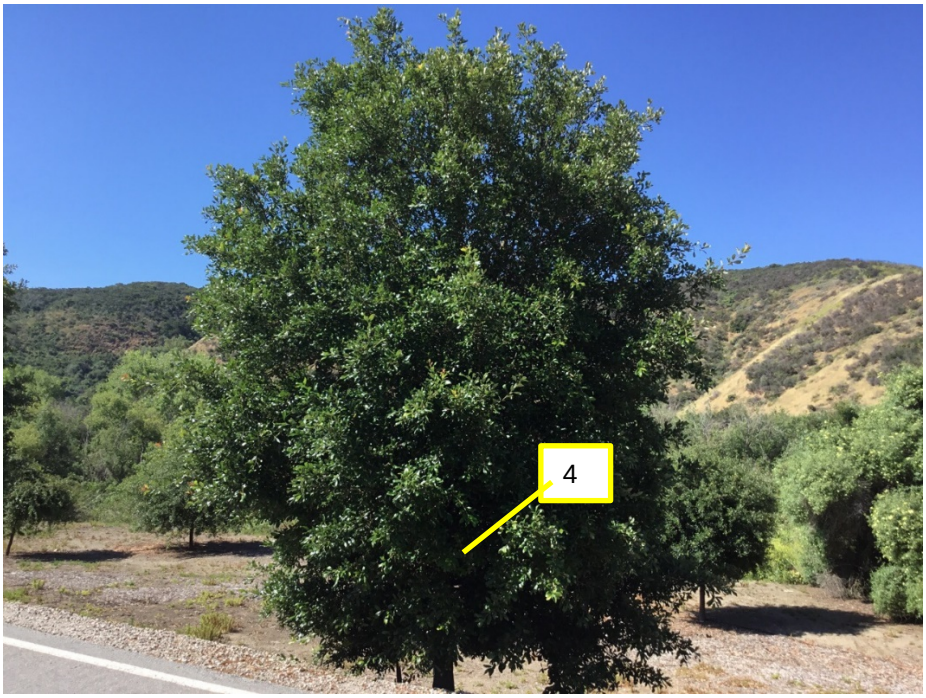
Photograph 1. Tree Number 1. Photograph taken facing southwest from Hill Canyon Fire Road.



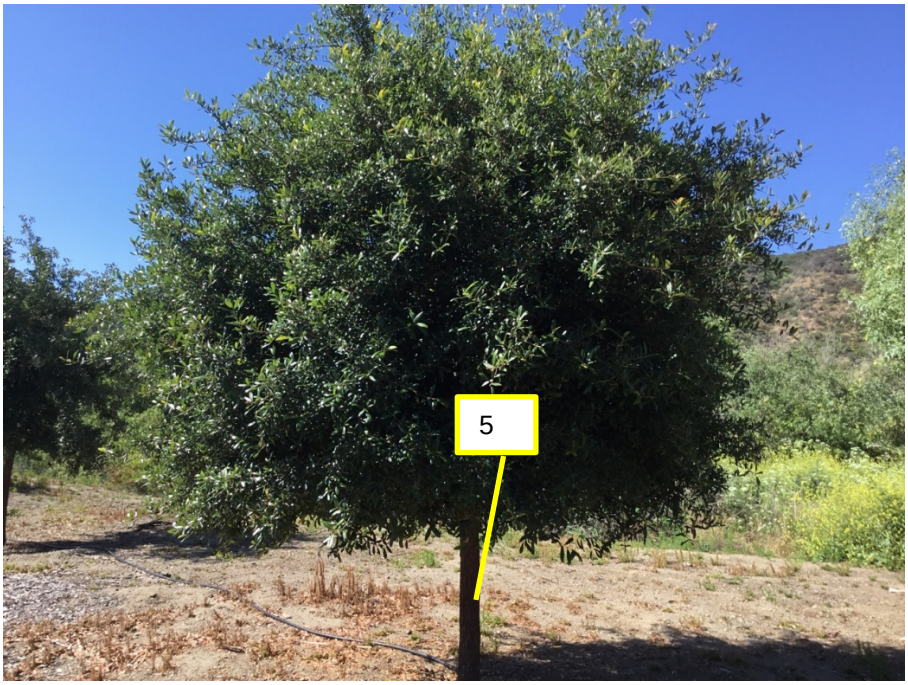
Photograph 2. Tree Number 2. Photograph taken facing southwest from Hill Canyon Fire Road.



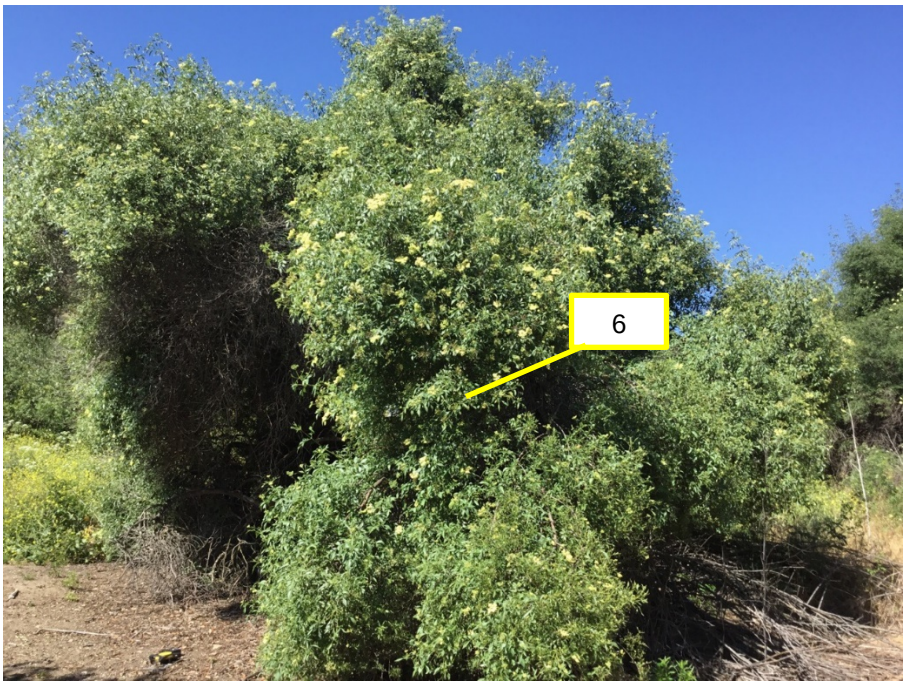
Photograph 3. Tree Number 3. Photograph taken facing south from Hill Canyon Fire Road.



Photograph 4. Tree Number 4. Photograph taken facing south from Hill Canyon Fire Road.

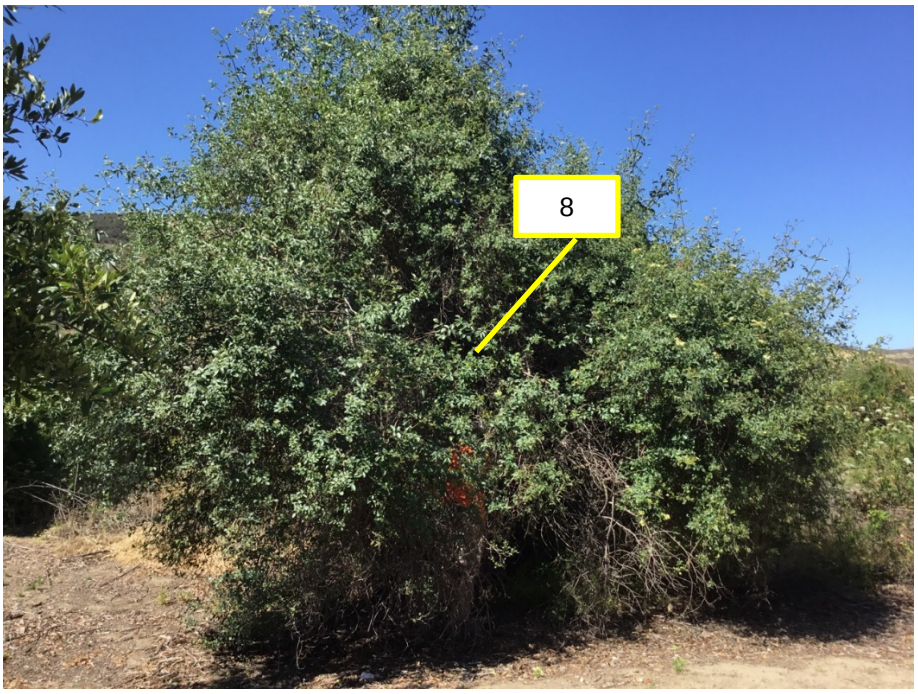


Photograph 5. Tree Number 5. Photograph taken facing south from Hill Canyon Fire Road.

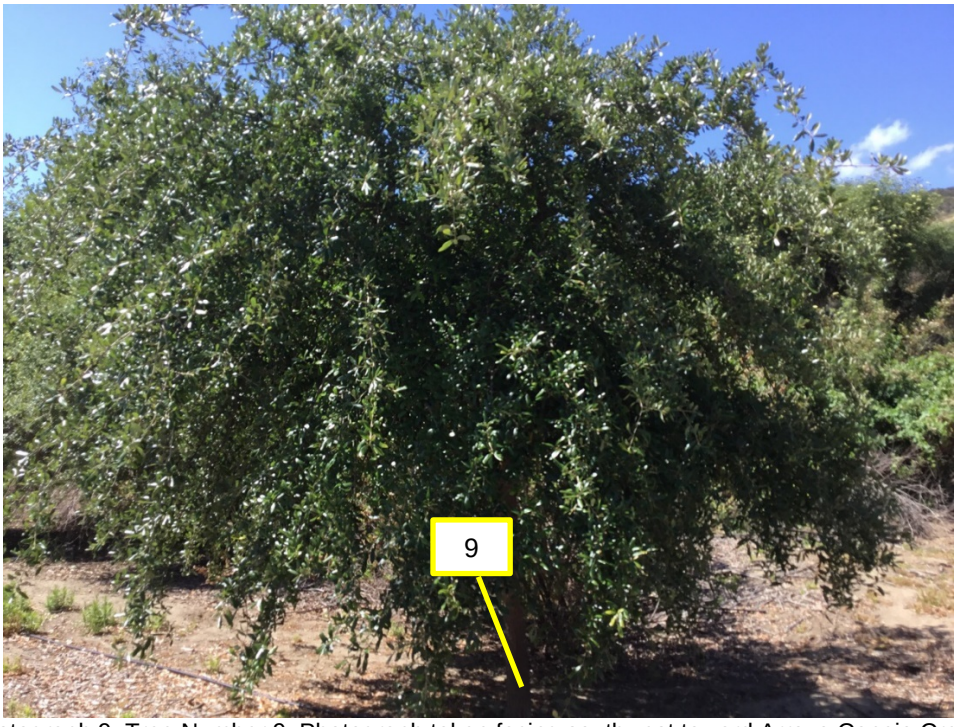


Photograph 6. Tree Number 6. Photograph taken facing west.

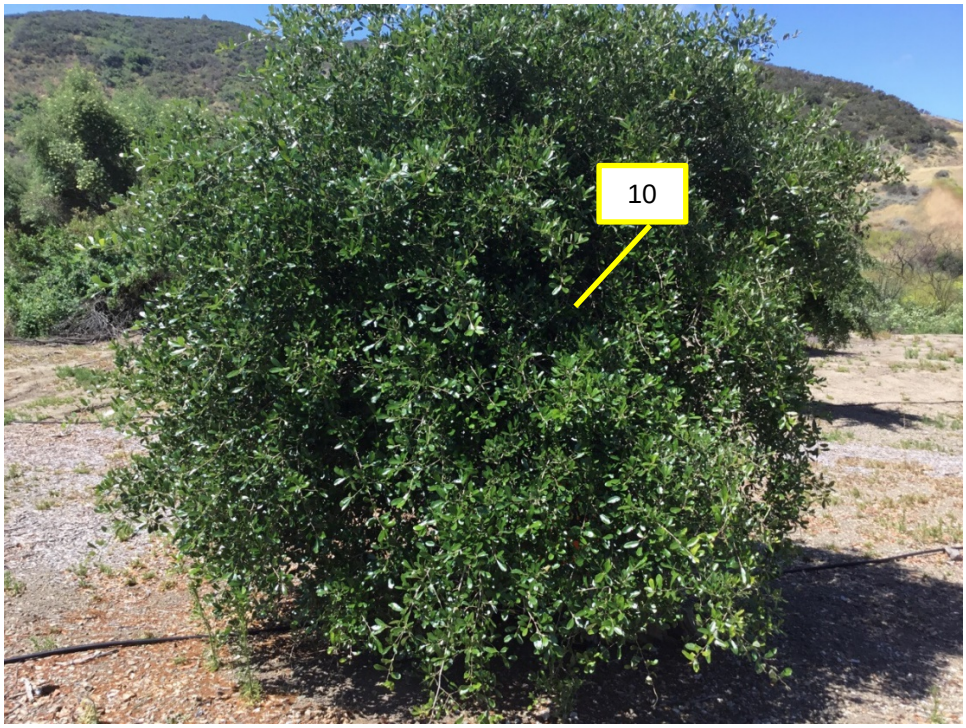
Photograph 7. Tree Number 7. Photograph taken facing northwest.



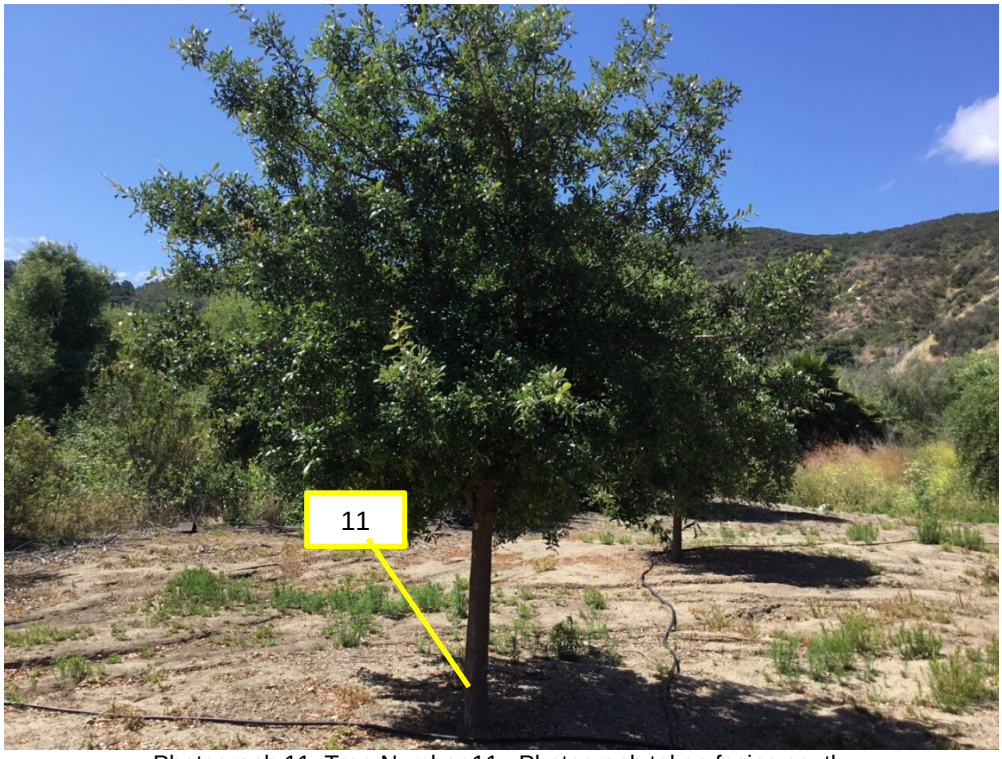
Photograph 8. Tree Number 8. Photograph taken facing southwest.



Photograph 9. Tree Number 9. Photograph taken facing southwest toward Arroyo Conejo Creek.

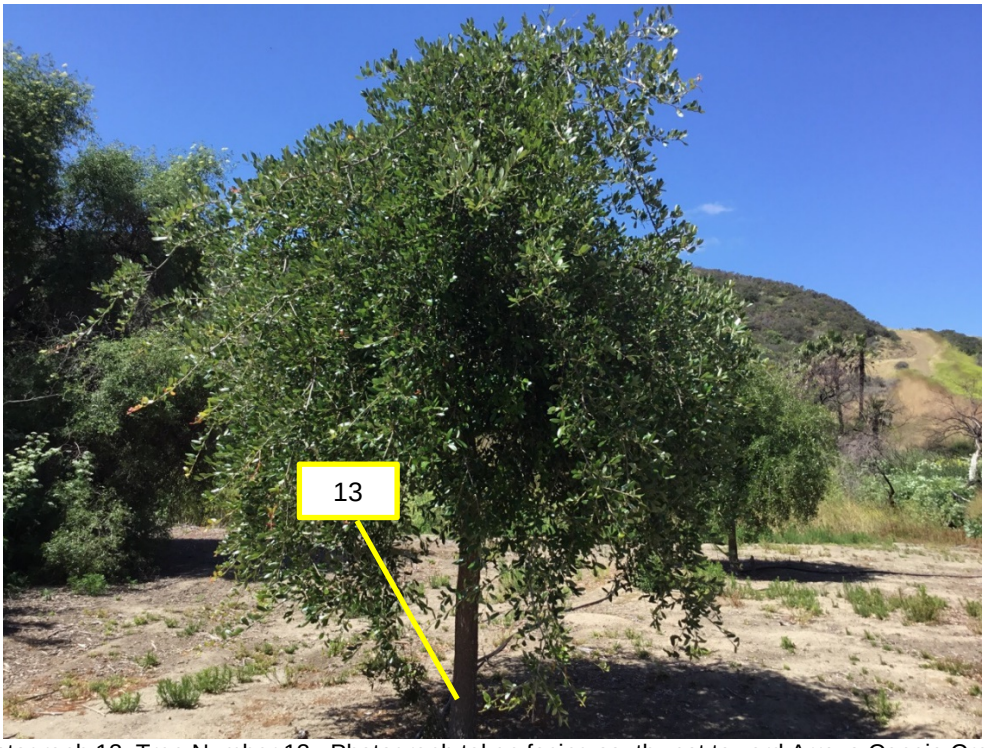


Photograph 10. Tree Number 10. Photograph taken facing southwest toward Arroyo Conejo Creek.

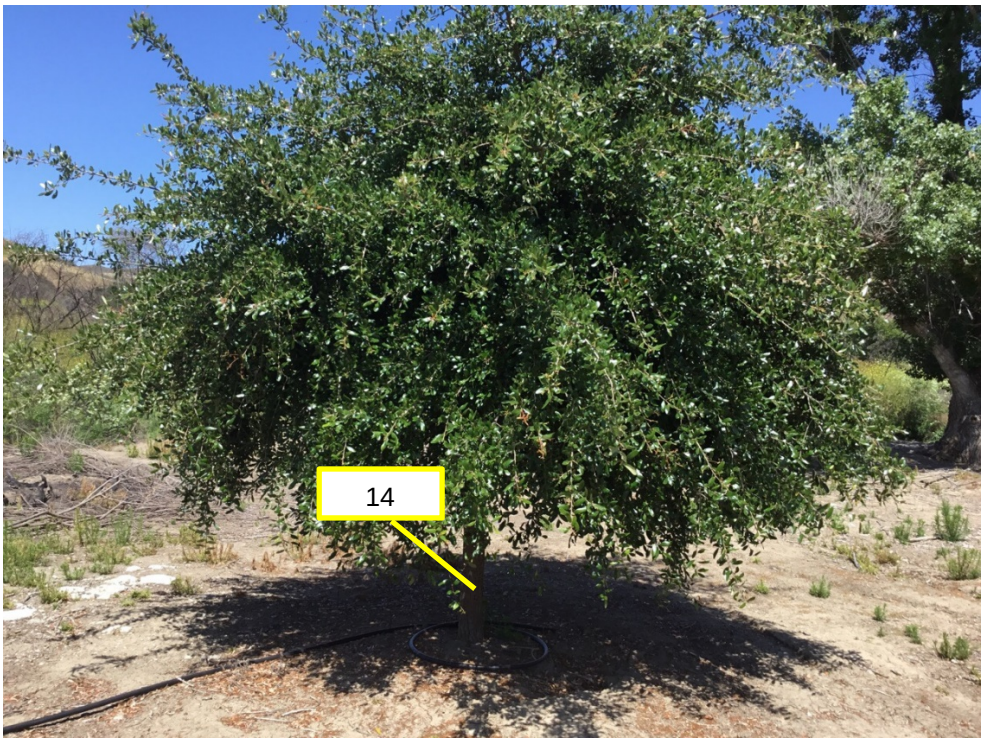


Photograph 11. Tree Number 11. Photograph taken facing south.

Photograph 12. Tree Number 12. Photograph taken facing southwest toward Arroyo Conejo Creek.



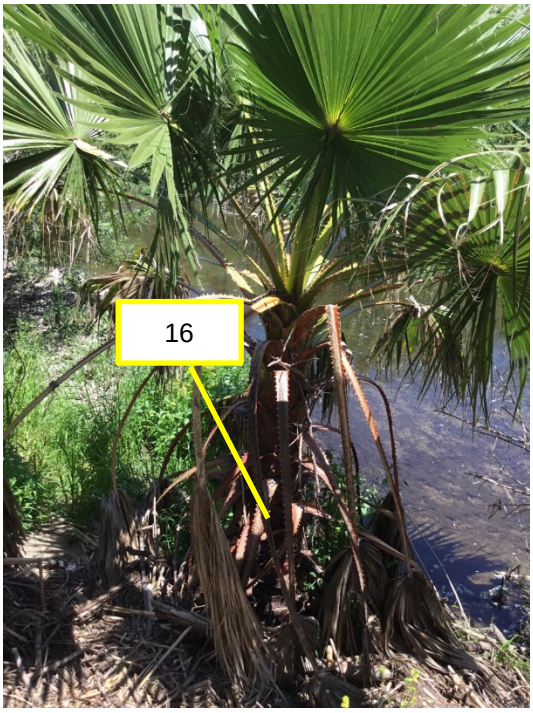
Photograph 13. Tree Number 13. Photograph taken facing southwest toward Arroyo Conejo Creek.



Photograph 14. Tree Number 14. Photograph taken facing northwest.

Photograph 15. Tree Number 15. Photograph taken facing southwest toward Arroyo Conejo Creek.

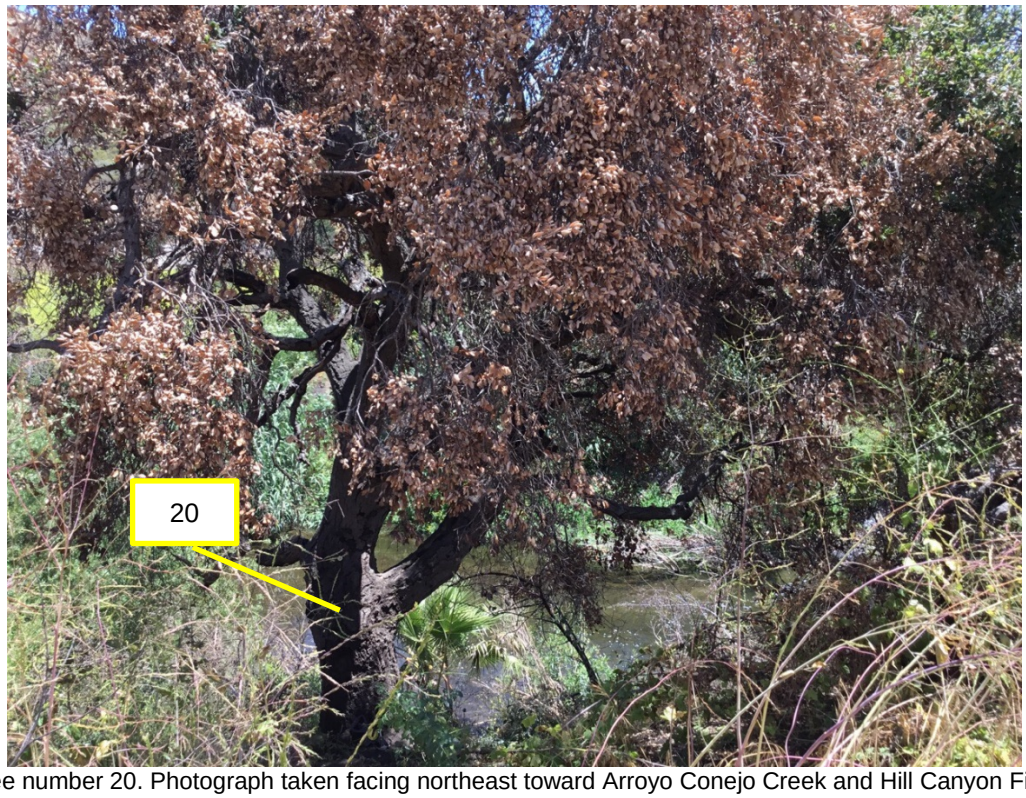
Photograph 16. Tree not tagged. Photograph taken facing south toward Arroyo Conejo Creek.



Photograph 17. Tree Number 16. Photograph taken facing northeast toward Arroyo Conejo Creek.

Photograph 18. Tree Number 18. Photograph taken facing west.

Photograph 19. Tree Number 19. Photograph taken facing west.



Photograph 20. Tree number 20. Photograph taken facing northeast toward Arroyo Conejo Creek and Hill Canyon Fire Road.

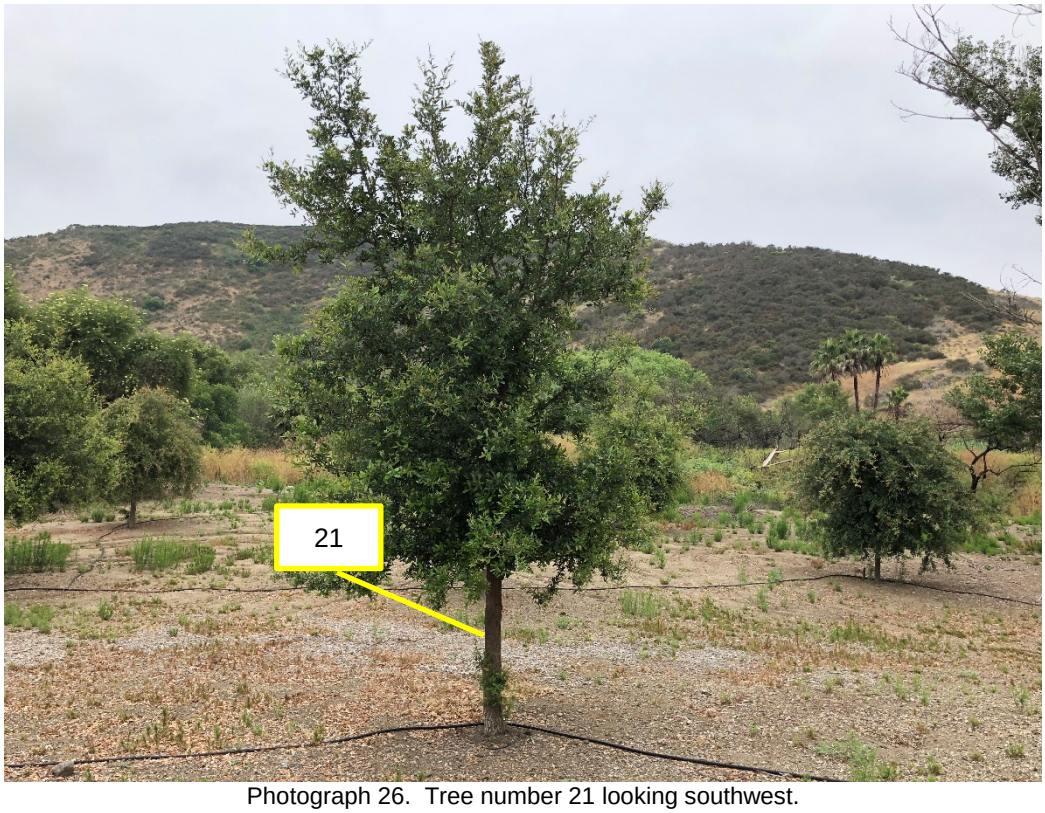
Photograph 21. Photograph of included bark on tree.

Photograph 22. Tree number 10. Photograph of rubber support tie grown into tree trunk.

Photograph 23. Photograph of cracked and broken branches on unnumbered elderberry.

Photograph 24. Tree number 20. Photograph of branch rot and frass from boring insects.

Photograph 25. Tree number 20. Photograph of large trunk cavity.



Photograph 26. Tree number 21 looking southwest.