

Initial Study/Mitigated Negative Declaration

Bollea Road Bridge Replacement Project

JUNE 2020

Prepared for:
San Joaquin County
Department of Public Works
1810 E. Hazelton Avenue
Stockton, CA 95205

Prepared by:



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SECTION 1.0 – INTRODUCTION

The proposed Bollea Road Bridge Replacement Project is a project as defined under the California Environmental Quality Act (CEQA). This Initial Study (IS) was prepared for the San Joaquin County Public Works Department (County) pursuant to California Environmental Quality Act of 1970, Public Resources Code § 21000, et seq., as amended and implementing State CEQA Guidelines, Title 14, Chapter 3 of the California Code of Regulations (collectively, CEQA).

- 1. Project Title:** Bollea Road Bridge Replacement (Bridge Number 29C-041)
- 2. Lead Agency Name and Address:** San Joaquin County Public Works Department
1810 East Hazelton Ave.
Stockton, CA 95201
- 3. Contact Person and Phone Number:** Michael Chung, P.E., Interim Bridge Engineering Manager
msaqq@sjgov.org
(209) 468-8924
- 4. Project Location:** County line between San Joaquin and Calaveras Counties
Bollea Road crossing Bear Creek
Approximately 1,500 feet west of CA Highway 12
Wallace Census-designated area
Unincorporated San Joaquin and Calaveras Counties
Assessor's Parcel Numbers (A.P.N.) 02322011, 02322012, 48019145 and 48019045
- 5. Project Sponsor** County of San Joaquin
- 6. General Plan Land Use Designation:** San Joaquin County: General Agriculture, Resource Conservation/Open Space
Calaveras County: Community Center, Rural Residential
- 7. Zoning:** San Joaquin County: Agricultural/Grazing-80 acres
Calaveras County: Business Park, Rural Residential
- 8. Surrounding Land Uses and Setting:** Rural Residential, Agriculture, Undeveloped Open Space
- 9. Description of Project:** The County would replace the existing bridge across Bear Creek considered structurally deficient with a new structurally sound bridge. A temporary single lane detour has been constructed to the east side of the bridge for a prior emergency repair project and will remain in place over the course of construction.

Date Initial Study Completed: June 2020

1.1 PURPOSE OF STUDY

This IS examines the potential effects on the environment of the San Joaquin County Public Works Department's (County's) proposed Bollea Road Bridge Replacement Project and associated construction of a temporary access road to facilitate project construction (Proposed Project).

The Proposed Project assessed within this IS is described in Section 2.0 and includes provisions to address known environmental concerns. The project description, including these provisions, provides the project baseline for which environmental impacts are analyzed in Section 3.0. This IS was prepared pursuant to CEQA.

This IS has identified potentially significant impacts and mitigation measures, which, when incorporated into the Proposed Project as described in Section 2.0, would reduce these impacts to less than significant levels. Therefore, this IS would support a Mitigated Negative Declaration under CEQA Guidelines Section 15070.

This IS is organized into the following sections:

Section 1.0 - Introduction: Provides an overview of the Proposed Project, location, sponsor, when the IS was completed, environmental resources potentially affected by the Proposed Project, and the significance determination of the Proposed Project on the environment by the lead agency.

Section 2.0 - Project Description: Includes project a detailed description of the Proposed Project and background information.

Section 3.0 - Environmental Checklist and Discussion: Contains the Environmental Checklist form together with a discussion of the environmental issues. Mitigation measures, if necessary, are noted, following each impact discussion. The numbering sequence for each of the mitigation measures is related to their associated topical sections.

Section 4.0 – List of Preparers

Section 5.0 – Bibliography

1.2 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

Impacts to all resources listed below are evaluated using the checklist included in **Section 3.0**. However, only the environmental factors that have been checked could be potentially affected by the Proposed Project, involving impacts requiring mitigation to bring it to a less-than-significant level. The unchecked resource areas were determined to have a less-than-significant impact or no impact, even without mitigation.

- | | |
|---|--|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Land Use and Planning |
| <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Mineral Resources |
| <input type="checkbox"/> Air Quality | <input checked="" type="checkbox"/> Noise |
| <input checked="" type="checkbox"/> Biological Resources | <input type="checkbox"/> Population and Housing |
| <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Energy | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Geology and Soils | <input type="checkbox"/> Transportation and Circulation |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Tribal Cultural Resources |
| <input checked="" type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Utilities and Service Systems |
| <input checked="" type="checkbox"/> Hydrology and Water Quality | <input type="checkbox"/> Wildfire |
| | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

1.3 SIGNIFICANCE DETERMINATION

On the basis of the environmental evaluation presented in **Section 3.0**:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to the earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Date

Printed Name

San Joaquin County Public Works Department
Lead Agency

SECTION 2.0 – PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

This IS/MND provides project-level CEQA review for the Proposed Project as described in detail in this section.

2.1.1 EXISTING SETTING

Project Site Location

The Proposed Project site is located in a rural area on the eastern border of the County of San Joaquin and the western border of the County of Calaveras, along Bollea Road and crossing over Bear Creek (**Figure 2-1, Figure 2-2**). The site is approximately 1,500 feet west of California State Route 12 and west of the unincorporated census-designated area of Wallace. It is surrounded by rural residential land, agricultural land and undeveloped open space (**Figure 2-3**). The Proposed Project site includes the Bollea Road Bridge (No. 29C-413) and encompasses a total of 4.434 acres. A 60-foot wide railroad easement crosses Bollea Road approximately 280 feet north of the site.

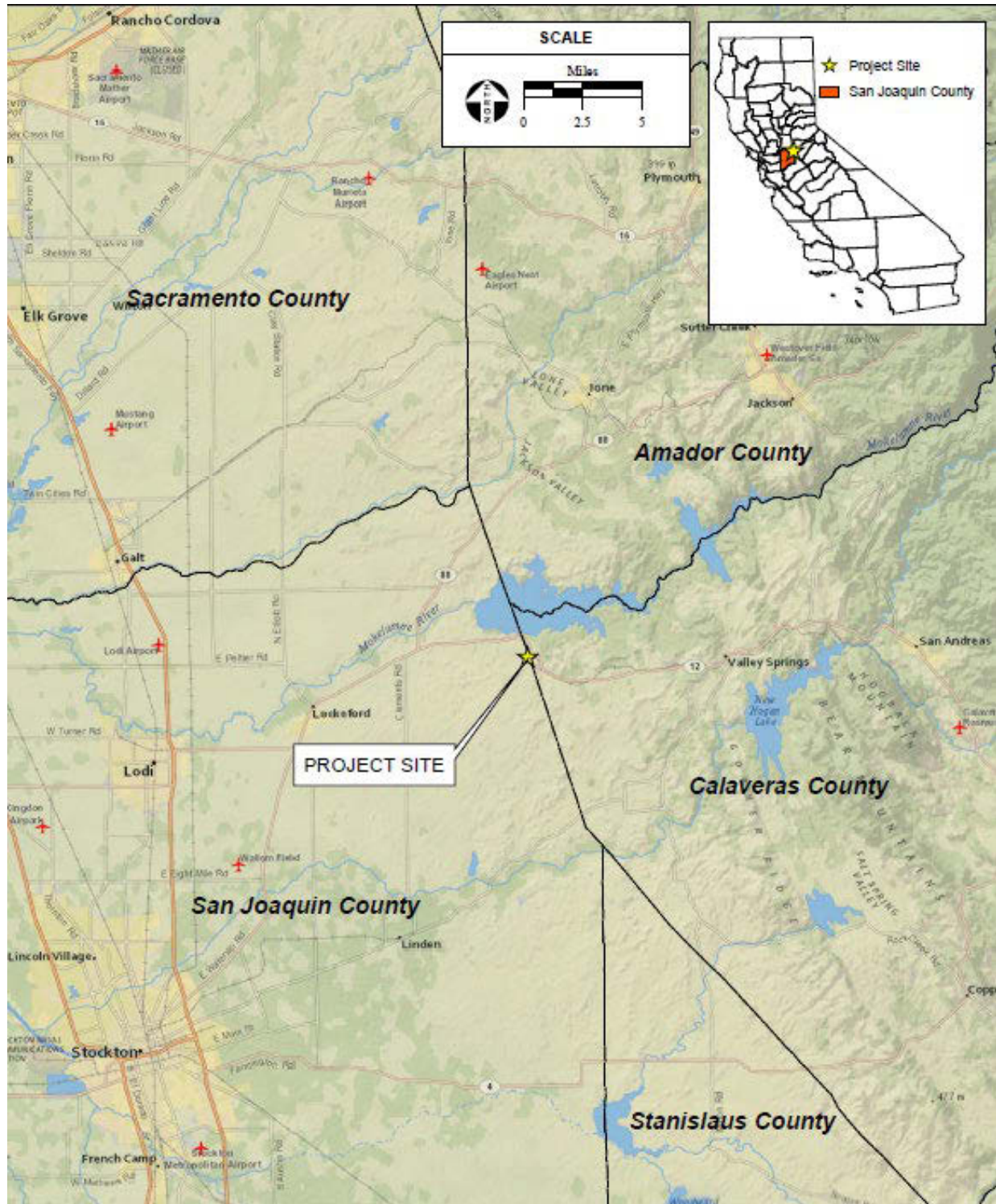
Surrounding land ownership includes privately held parcels (Assessor's Parcel Number (APN): 02322011 and 02322012 in San Joaquin County, 48019145 and 48019045 in Calaveras County) as well as County-owned right-of-way (ROW) (SJC Assessor 2015, MGE 2018). The location of Bollea Road within the existing ROW varies based on location. In Calaveras County, the road is centered within the 50-foot ROW. In San Joaquin County, the roadway centerline is shifted approximately 5 feet to the east.

The Proposed Project site extends approximately 450 feet north of the existing bridge to 420 south of the bridge, and 100 feet on either edge of Bollea Road (**Figure 2-4**). Abutment piles may be driven approximately 37 feet below ground; these areas are also considered part of the project site. This horizontal and vertical area encompasses the maximum extent of potential ground-disturbing activities reasonably expected from the project, and is referred to as the "Proposed Project site" throughout the remainder of this document.

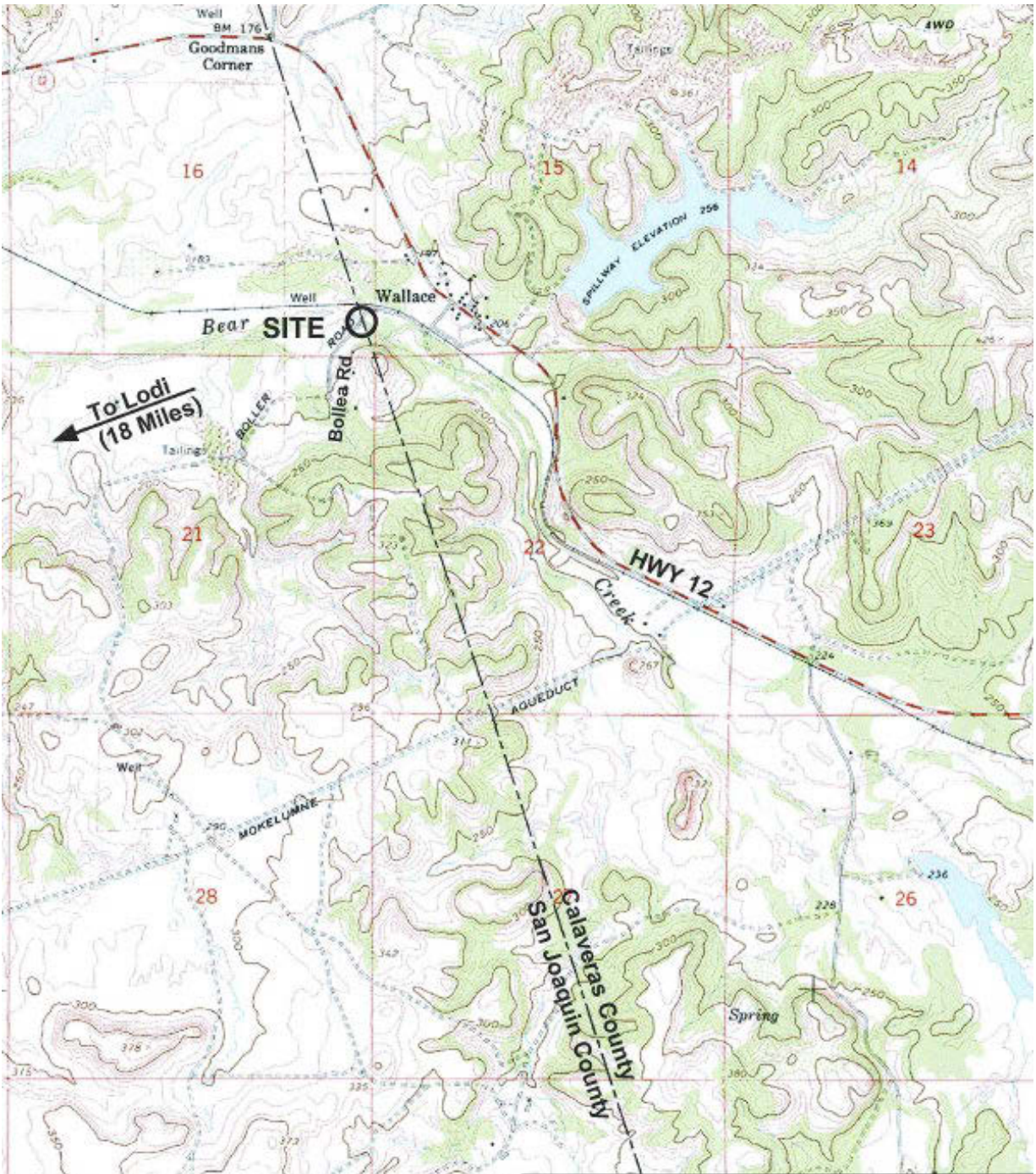
Project Site Existing Conditions

The Proposed Project site crosses western San Joaquin County and eastern Calaveras County on the existing paved Bollea Road. Bollea Road is a rural road that serves fewer than ten residential parcels and ends approximately 1,500 feet south of the project site. Bollea Road has a prima facie 55 mile per hour speed limit, except in the vicinity of the bridge where the curves are posted for 25 miles per hour. The road has an Average Daily Traffic (ADT) of approximately 26 vehicles per day and projected ADT of 42 vehicles per day in 2032. The existing bridge crossing Bear Creek was determined structurally deficient in 2010, with a sufficiency rating of 46.8, and is eligible under the Federal Highway Bridge Program (HBP) for replacement. The bridge is composed of two welded railcars and spans 56 feet by 19 feet wide. The south abutment of the bridge was undermined due to heavy storms during the winter of 2017, causing the bridge to become impassable. An emergency detour consisting for four corrugated metal

Figure 2-1 — Regional Location



Source: Appendix D.

Figure 2-2 — Project Location

Source: Appendix D.

Figure 2-3 — Aerial Photograph



Source : MGE 2017.

Figure 2-4 —Proposed Project Site



Source: Appendix D.

pipes, a layer of rip-rap covered with matting and compacted earth, was installed approximately 15 feet east of the bridge to provide access for the six residences located south of the bridge. An emergency repair to the south abutment was performed, which allowed the bridge to be reopened; however, the detour has been left in place for use during project construction.

The Proposed Project site would span approximately 475 feet along Bollea Road and approximately 100 feet from either edge, north and south, of the road. The 0.32-acre staging area would be located adjacent to the existing road bed west of the existing bridge, as shown on **Figure 2-4**. The completed replacement bridge would span 67 feet by 20 feet wide, slightly lengthening the bridge and decreasing the approaching profile from the existing bridge. The temporary culverts would remain in place over the course of construction. A majority of the site is located in unincorporated San Joaquin and Calaveras Counties. Minimal acquisition of temporary and permanent ROW would be required for roadway alignment and the roadway embankment. Temporary ROW would be required on private rural residential land.

Project Site General Plan and Zoning Designations

The San Joaquin County General Plan designates the land parcel southwest of Bollea Road west of the existing bridge along the county border as A/G (General Agriculture) with AG-80 zoning, and the two land parcels northeast of the road adjacent to the existing bridge as OS/RC (Resource Conservation) and A/G, both with AG-80 zoning (SJCDD 2019, 2016). The A/G designation is for agricultural and grazing uses outside of urban development and the OS/RC designation is for areas with significant resources that are generally to remain open space (SJCDD, 2016). AG-80 refers to commercial agricultural lands with a minimum size of 80 acres (SJC, 2016b). The Calaveras County General Plan designates the land use along Bollea Road north of the county boundary as CC (Community Center) with M4 zoning (Business Park), and a small portion paralleling the road northeast of the county boundary as RR (Rural Residential). Community Center zoning is for mixed residential and commercial use to serve community residents and visitors (CC, 2019a, 2020).

Existing Adjacent Land Uses

Adjacent land uses are rural residential, agricultural and undeveloped open space. Three residences are located within 1,000 feet of the Proposed Project site. The nearest residence is approximately 325 feet southeast of the bridge. The second nearest residence is located approximately 650 feet southeast of the Proposed Project site. Adjacent properties do not have structures that would be potentially affected by the project; however, the project area includes banks of Bear Creek, pasture land and a vehicle storage yard on both sides of Bollea Road. A 60-foot wide railroad easement crosses Bollea Road approximately 280 feet north of the site: part of the Kentucky House Branch of the San Joaquin and Sierra Nevada Railroad.

2.2 PROJECT DESCRIPTION

2.2.2 CONSTRUCTION

The project involves replacement of an existing bridge along Bollea Road considered structurally deficient, and the removal on the temporary emergency bypass located approximately 15 feet to the east of the existing Bollea Road Bridge (No. 29C-413) at the conclusion of construction. The existing bridge has a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for the Federal Highway Administration (FHWA) by Caltrans (MGE, 2017). Construction would occur in coordination with the County of Calaveras and California Department of Transportation (Caltrans) District 10.

The replacement bridge would measure 67 feet long by 20 feet wide, to replace the current 56-foot by 19-foot bridge (MGE 2017). The existing bridge is composed of two welded rail cars. The new two-lane bridge would be a post-tensioned concrete slab bridge supported on seat-type abutments and a 24-inch cast-in-drilled-hole concrete piles (MGE, 2017). The new structure would be composed of two 10-foot-wide traffic lanes. It would have Caltrans standard Type 80 barrier rails and would meet current American Association of State Highway and Transportation Officials (AASHTO) standard width requirements for a two-lane facility (MGE, 2017). The profile grade would be raised approximately 0.55 feet to set the elevation of the low side of the bridge soffit at the 100-year water surface flow elevation. In addition, the new structure would include minor grading, depending on in-field and final designs. In fill sections, the embankment side slopes would be in a ratio of three high to one vertical (3H:1V), except behind the guard rail where it would be 2H:1V (MGE, 2017).

In addition, the new bridge alignment would be curved with a four percent super-elevation to improve drivability and sight distance, requiring a shift in the road alignment approximately four feet to the east (MGE, 2017). The west edge of the bridge would closely match the west edge of the existing bridge. The new alignment would require acquisition of additional permanent right-of-way (ROW), consisting of 0.03 acres east of Bollea Road within San Joaquin County and the entire roadway within Calaveras County (between the County line and the railroad easement) (MGE, 2017). The realignment is based on a 375-foot radius, compatible with a 40 mile per hour design speed, with the profiles on the approaches raised to eliminate the current low spots near the north and south abutments (MGE, 2017).

The Proposed Project site includes an approximately 475-foot area running north-south along Bollea Road, and approximately 100-foot area from either edge of the road (MGE, 2017). A 0.32-acre staging area would be used during the construction and be located just southeast of the existing bridge adjacent to the current road bed. Abutment piles may be driven approximately 37 feet below ground in some areas (MGE, 2017). This Proposed Project site includes all construction elements necessary for the project and staging areas.

Construction activities could include pile driving, structure demolition, excavation, and construction, roadway excavation and construction, and stream channel work. A Structure Type Selection Report (Report) was prepared for the Proposed Project (MGE, 2017). Three potential foundations were evaluated: Cast-in-Drilled Hole Piles, Spread Footings, and Driven Piles. Due

to the potential for future scour, spread footings were not considered feasible. Driven piles (displacement, concrete, open-end steel, or H-piles) are not considered feasible at the site due to likely hard driving conditions and the inability to achieve the adequate embedment to provide structural support. Instead, Caltrans Standard 24-inch Cast-in-Drilled Hole Piles are identified as the most suitable bridge foundation (MGE, 2017).

The work proposed within the creek channel would be limited to removal of the remnants of the old south bridge abutment, removal of the north bridge abutments, removal of the detour, and restoration of the south bank upstream of the bridge (MGE, 2017). Removal of the existing temporary bypass road would include restoration of the north and south banks to their pre-project condition (MGE, 2017). Removal would occur after the new bridge is capable of supporting vehicles. The gravel road base and associated culverts would be extracted from Bear Creek, and the stream channel would be restored to its pre-emergency bypass road conditions.

The expected period of construction for all work outside of Bear Creek is proposed to be between May 1 and October 31. In-stream work is anticipated to be conducted during the dry season, defined as between June 15 and October 31, or the first significant rainfall, whichever comes first. This period coincides with the time of year when Bear Creek has little to no flow. Dewatering may be required during removal and installation of the support structure. Dewatering may also be required during installation of the abutment piles if groundwater is encountered. During in-water work, all best management practices (BMPs) would be used to reduce the amount of sediment and debris that may be produced and avoid or minimize impacts to fish, flora and wildlife, in accordance with the San Joaquin County General Plan Natural and Cultural Resources Element (SJC, 2016a). The Proposed Project would comply with the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit, including the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that identifies erosion, sediment, and stormwater BMPs to protect water quality during construction of the Proposed Project (MGE, 2017).

During construction, work hours would be limited to 6:00 a.m. to 9:00 p.m. to comply with the San Joaquin County Development Title (SJC, 2019b, Section 9-1025.9). This title specifically exempts construction-related noise impacts associated with the maintenance of public utilities if activities are conducted during daytime hours (6 a.m. to 9 p.m.).

2.2.3 PROJECT APPROVAL PROCESS

The project may require the following permits:

- U.S. Army Corps of Engineers Clean Water Act Section 404 Permit
- California Department of Water Resources Clean Act Section 401 Certification
- State Water Resources Control Board (SWRCB) General Construction Permit for Stormwater
- California Department of Fish and Wildlife California Fish and Game Code Section 1602 Stream Alteration Agreement

SECTION 3.0 – ENVIRONMENTAL CHECKLIST

Pursuant to CEQA *Guidelines* Section 15063, an IS should provide the lead agency with sufficient information to determine whether to prepare an environmental impact report (EIR), negative declaration (ND), or Mitigated ND (MND) for a proposed project. The CEQA *Guidelines* state that an IS may identify environmental impacts by use of a checklist, matrix, or other method, provided that conclusions are briefly explained and supported by relevant evidence. If it is determined that a particular physical impact to the environment could occur, then the checklist must indicate whether the impact is Potentially Significant, Less Than Significant with Mitigation, or Less Than Significant. Findings of No Impact for issues that can be demonstrated not to apply to a proposed project do not require further discussion.

This IS was prepared to assess the environmental impacts of the Proposed Project in accordance with CEQA to provide State permitting agencies with sufficient information to determine whether to prepare an EIR, ND or MND for the Proposed Project.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.1 AESTHETICS				
Except as provided in Public Resources Code 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.1.1 ENVIRONMENTAL SETTING

The Bollea Road Bridge over Bear Creek (Bridge Number 29C-0413) is located in a rural area west of the unincorporated community of Wallace, adjacent to undeveloped open space, in addition to agricultural fields and rural residential areas. The nearest residence is approximately 325 feet southeast of the existing bridge and proposed construction zone. The project area includes banks of Bear Creek, pasture land and a vehicle storage yard on both sides of Bollea Road. A 60-foot wide railroad easement crosses Bollea Road approximately 280 feet north of the site: part of the Kentucky House Branch of the San Joaquin and Sierra Nevada Railroad.

The scenic quality of the project site is characterized by undeveloped open space, agricultural fields, and rural residential areas. The project site is composed of relatively flat to gently rolling terrain at an elevation of approximately 200 feet above mean sea level.

The proposed project is not located on an officially designated state or county scenic highway (Caltrans, 2019; Caltrans, 2015). The site of the proposed project is not located within or immediately adjacent to a Wild and Scenic River System.

3.1.2 IMPACT DISCUSSION

QUESTION A

The project area includes banks of Bear Creek, pasture land and a vehicle storage yard on both sides of Bollea Road. A 60-foot wide railroad easement crosses Bollea Road approximately 280 feet north of the site: part of the Kentucky House Branch of the San Joaquin and Sierra Nevada Railroad. The Proposed project would consist of construction activities which include pile driving, excavation, construction, and stream channel work. Stream channel work includes removal of the old south abutment, north bridge abutment, followed by removal of the detour once construction of the bridge is complete. In addition, the south bank upstream of the bridge will be restored with rip-rap placed on the bank to mitigate against scour. There are no scenic vistas in the area and the Proposed Project would result in the replacement of an existing bridge. **Less-Than-Significant Impact.**

QUESTION B

The project area includes banks of Bear Creek, pasture land and a vehicle storage yard on both sides of Bollea Road. A 60-foot wide railroad easement crosses Bollea Road approximately 280 feet north of the site: part of the Kentucky House Branch of the San Joaquin and Sierra Nevada Railroad.

The project site is not located on a state scenic highway nor a county scenic highway for San Joaquin County or Calaveras County, and thus will not damage any scenic resources such as trees, rock outcroppings, or historic buildings within the viewshed of any scenic highway. Agricultural open spaces located around the project site are considered scenic resources, however, they will not be affected by construction activities. **No impact.**

QUESTION C

The Proposed Project is located on a rural road along Bollea Road, which receives low traffic (26 average vehicles per day). The bridge, as constructed currently, is approached by a road from the north which continues to the south. The location of Bollea Road within the existing right-of-way varies in alignment based on location (MGE, 2017). In Calaveras County, the road is centered within the 50-foot right-of-way, however, the roadway centerline is shifted 5 feet to the east when transitioning to San Joaquin County, based on field surveys that located the centerline stripe of the road (MGE, 2017).

As a result of the Proposed Project, the change in the visual character of the site during construction and operation would be minimal. Construction will last for a temporary period and would mainly consist of excavating, construction, and stream channel work. The change in visual character of the site during operation would include a staging area of approximately 0.32 acres (70 feet by 200 feet long) which is proposed to be located south of the bridge, and adjacent to the east right-of-way line on the Kackley property. Additionally, a minimal expansion to the right-of-way to correct and align the centerline strip through the transition through the county line, which is expected to improve the aesthetic quality. The County aesthetic requirement for the installation of the Caltrans Type 85 concrete barrier on the bridge to conform to the rural nature of the surrounding area will be incorporated.

During project work, construction activities will affect the visual quality for a short period, which will affect a minimum number of travelers, given the low traffic volume of 26 vehicles per day. Onlookers from the rural residential area (Kackley property and Doll property) are located adjacently south of the bridge, less than 1000 feet from the project location, and will be in viewing distance during construction. Given the rural nature of the project site and limited access points, the project site is not anticipated to draw in additional onlookers. However, the replacement of the currently structurally deficient bridge and realignment of the road right-of-ways are expected to improve the aesthetic quality of the area. The remaining areas of the site would appear visually unchanged. **Less-Than-Significant Impact.**

QUESTION D

Currently the site does not contain any form of lighting. The Proposed Project does not include the installation of any temporary lighting as construction activities would occur during the day. Furthermore, no permanent lights are included in the bridge design. Therefore, the Proposed Project would not add substantial sources of new daytime or nighttime lighting or glare and thus would not adversely affect day or nighttime views in the area. **No Impact.**

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.2 AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest Range Assessment Project and Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.2.1 ENVIRONMENTAL SETTING

The Proposed Project site is located in a rural area west of the unincorporated community of Wallace. Central Wallace is located across CA Highway 12 northeast of the Proposed Project site approximately 0.3-mile. Wallace has a population of less than 900. The Proposed Project

site is surrounded by grazing land, open space and agricultural fields, and rural residential properties (DLRP, 2015). The Proposed Project site crosses the bed of Bear Creek, a narrow channel with seasonally flowing water that is a tributary to the San Joaquin River. The creek runs in an east-west direction beneath the existing bridge and topography in the vicinity of the site slopes toward Bear Creek. The land contains mixed riparian vegetation, overflow and scour channels, and disturbed habitat. Unpaved vehicular storage lots are adjacent to Bollea Road on the east and west sides. While the site has been used for agricultural purposes and grazing, it does not contain substantial woody vegetation or vegetation. It has not been used as forest land or for timber harvest.

The Natural Resource Conservation Service collects soil data and categorizes farmland. Only partial data is available for the project area, however. The NRCS has mapped and classified soils on the San Joaquin County side, but tabular data is not currently available for the Calaveras County foothills. The majority of the project area in San Joaquin County contains soils that are classified as prime farmland if irrigated (DLRP, 2015).

3.2.2 REGULATORY SETTING

FARMLAND MAPPING AND MONITORING PROGRAM

The U.S. Department of Agriculture (USDA) and the California Department of Conservation (DOC) analyze farmland losses. In 1975, the USDA Soil Conservation Service (SCS) began a mapping program to produce agricultural resource maps based on soil quality and land use nationwide. In 1982, the State of California created the Farmland Mapping and Monitoring Program (FMMP) within the DOC to carry out the mapping activity from the USDA-SCS on a continuing basis. The FMMP produces maps and statistical data used for analyzing impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status and is based on information obtained from aerial photographs and data from the NRCS. For farmland to be considered "Prime" or of "Statewide Importance" in California, land must have been used for irrigated agricultural production at some time during the four years prior to the Important Farmland Map date.

WILLIAMSON ACT

The California Legislature passed the California Land Conservation Act (commonly referred to as the "Williamson Act") in 1965 to preserve agricultural lands and open space by discouraging premature and unnecessary conversion to urban uses. Under the Williamson Act, private landowners contract with counties and cities to voluntarily restrict privately-owned land to agricultural and compatible open-space uses. In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual use, rather than their potential market value. The vehicle for these agreements is a rolling-term, ten-year contract that is automatically renewed unless either party files a "notice of nonrenewal." Although lands near the Proposed Project site to the west and south are in Williamson Act contracts, none of the Proposed Project site is subject to a Williamson Act contract (San Joaquin County, 2015).

COUNTY PLANNING

Various lands within the County of Calaveras are zoned as General Forestry (GF), with General Plan land use designations as Resource Management (RM), Resource Production (RP), and Working Lands (WL). Lands of the Proposed Project site within Calaveras County are designated as Rural Residential (RR) and Community Center (CC); they are not designated for agricultural or forestry use. Various lands within the County of San Joaquin are zoned as General Agriculture (AG), Limited Agriculture (AL) and Agriculture-Urban Reserve (AU) with complementary General Plan land use designations A/G, A/L and A/UR, respectively. Some lands within the County are also designated as Resource Conservation (OS/RC), intended to provide for areas with significant resources and to remain open space. This may include some forestry resources, as well as open grasslands and shrubbery. Lands of the Proposed Project site within San Joaquin County are zoned as AG with General Plan land use designations of A/G and OS/RC. Although Prime Farmland, Unique Farmland, and Farmland of Statewide Importance have been identified within the County, none occur within the Proposed Project site, which consists only of Farmland of Local Importance and Grazing Land (DLRP, 2015). Additionally, the Proposed Project site is predominantly undeveloped and uncultivated; it is not currently used for intensive agriculture.

3.2.3 IMPACT DISCUSSION

QUESTIONS A THROUGH E

The Proposed Project is not located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; however, it is located on Grazing Land and Farmland of Local Importance. Additionally, the Proposed Project site is not subject to a Williamson Act contract. Although lands within San Joaquin County are zoned for agriculture, with AG and OS/RC land use designations, the Proposed Project site is largely uncultivated and is not used for intensive agriculture. Lands of the Proposed Project site within Calaveras County are zoned as RR and CC and are similarly not used for intensive agriculture or grazing. As stated above, there is no existing forest land, timberland, or timberland zoned as RP within the Proposed Project site. Accordingly, there would be no conflict with existing zoning for forest land. Additionally, because the land use would not change as a result of the Proposed Project, there would be no conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. Therefore, the Proposed Project would have **no impact** on agricultural resources, forest resources or Williamson Act lands, nor would it conflict with existing zoning for these lands.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.3.1 ENVIRONMENTAL SETTING

San Joaquin County is located at the northern end of the San Joaquin Valley Air Basin (SJVAB), and is within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Calaveras County is located within the Mountain Counties Air Basin (MCAB) and is within the jurisdiction of the Calaveras County Air Pollution Control District (CCAPCD), a Special District governed by the Calaveras County Air Pollution Control Board. Because the Proposed Project site crosses county borders, it is subject to both the SJVAPCD and CCAPCD air quality regulations.

The MCAB is an approximately 11,000-square-mile area that encompasses Amador, Calaveras, Mariposa, Nevada, Plumas, Sierra, and Tuolumne Counties. Relatively few sources of air quality emissions are located within Calaveras County. However, air quality impacts occur through the transport of air quality pollutants from the more developed Central Valley to the County. Therefore, while sources of emissions within the County may be limited, the transport of emissions from outside of the County into the County can negatively impact air quality within Calaveras County. The pollution potential for the SJVAB and San Joaquin County is very high due to the topographic and meteorological conditions which often trap air pollutants in the valley (SJC, 2016a).

In compliance with the federal Clean Air Act (CAA), United States Environmental Protection Agency (EPA) and California Air Resources Board (CARB) standards for ambient air quality of

common pollutants requirements, the SJVAPCD and CCAPD prepare plans for reducing pollutants, particularly ozone, fine and ultrafine particulate matter (PM₁₀ and PM_{2.5}), and carbon monoxide emissions to meet the EPA's National Ambient Air Quality Standards (NAAQS) as well as the more stringent California standards. An air basin is in "nonattainment" when pollutant concentrations exceed these levels.

CARB operates the San Andreas-Goldstrike Road air quality monitoring station at 501 Gold Strike Road in San Andreas. This is the nearest air quality monitoring station to the Proposed Project site, approximately 16.5 miles east of the Proposed Project site in Calaveras County. **Table 3.3-1** shows historical occurrences of air pollutant levels exceeding State and federal ambient air quality standards between 2016 and 2018. The highest annual measurement and the number of days that each standard was exceeded are presented. The one-hour ozone, eight-hour ozone, PM_{2.5} and PM₁₀ thresholds were exceeded in 2017 and 2018, while only the eight-hour ozone threshold was exceeded in 2016 (CARB, 2020c).

**TABLE 3.3-1 AIR QUALITY EXCEEDANCES AT
SAN ANDREAS-GOLD STRIKE MONITORING STATION, 2016-2018**

		Highest Measurement, Days Standard Was Exceeded		
		2016	2017	2018
Pollutant	Measure			
1-Hour Ozone State Standard (0.090 ppm, 2016, 2017; 0.10ppm 2018)	Highest Value	0.094	0.109	0.105
	Days Standard was Exceeded	0	2	2
8-Hour Ozone Federal Standard (0.070 ppm)	Highest Value	0.085	0.094	0.086
	Days Standard was Exceeded	22	12	10
PM_{2.5} Federal Standard (35 µg/m ³)	Highest Value	27.6	59.2	67.7
	Days Standard was Exceeded	0	4	16
PM₁₀ State Standard (50 µg/m ³)	Highest Value	27.6	101.3	66.8
	Days Standard was Exceeded	0	4	5
Note: Data obtained from monitoring station at 501 Gold Strike Road, San Andreas, Calaveras County. Source: CARB 2020c.				

3.3.2 REGULATORY SETTING

The 1977 Federal CAA required the U.S. EPA to identify NAAQS to protect public health and welfare. NAAQS have been established for the six "criteria" air pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter (PM), and lead. PM is designated into two size classes, coarse particulate matter 10 micrometers or less in diameter (PM₁₀) and fine particulate matter 2.5 micrometers or less in diameter (PM_{2.5}). The smaller size of PM_{2.5} allows it to enter the cardiovascular system and cause more serious health problems. For this reason the NAAQS sets a more stringent standard on PM_{2.5} in ambient air quality. Pursuant to the 1990 CAA Amendments (CAAA), the EPA has classified air basins

(or portions thereof) as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the NAAQS have been achieved. The attainment status of San Joaquin and Calaveras Counties for the NAAQS are listed in **Table 3.3-2**.

CARB has adopted California ambient air quality standards (CAAQS) that are more stringent than the Federal standards for the criteria air pollutants. Under the California Clean Air Act (CCAA), patterned after the Federal CAA, areas have been designated as attainment or non-attainment with respect to CAAQS. Both the Calaveras and San Joaquin County attainment statuses for the CAAQS are listed in **Table 3.3-2**. The Proposed Project is in an NAAQS non-attainment area for ozone (both San Joaquin and Calaveras Counties); in a CAAQS non-attainment area for PM_{2.5} (San Joaquin County); in an NAAQS non-attainment area for PM_{2.5} (Calaveras County); and in a CAAQS non-attainment area for PM₁₀. It is in an NAAQS and CAAQS maintenance area for CO in San Joaquin County and in an attainment area for CO in Calaveras County.

TABLE 3.3-2 SAN JOAQUIN AND CALAVERAS COUNTIES ATTAINMENT STATUS

Pollutant	Averaging Time	California			National		
		Standard	Calaveras County Attainment Status	San Joaquin County Attainment Status	Standard	Calaveras County Attainment Status	San Joaquin County Attainment Status
Ozone	8 Hour	0.070 ppm (137 µg/m ³)	Non-attainment	Non-attainment	0.070 ppm Primary same as secondary	Non-attainment	Non-attainment
	1 Hour	0.09 ppm (180 µg/m ³)	Non-attainment	Non-attainment	N/A	Unclassified/Attainment	Non-attainment
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m ³)	Attainment	Attainment	9 ppm (10 mg/m ³)	Unclassified	Unclassified
	1 Hour	20 ppm (23 mg/m ³)	Unclassified/Attainment	Attainment	35 ppm (40 mg/m ³)	Unclassified/Attainment	Maintenance
Nitrogen Dioxide	1 Hour	0.18 ppm (339 µg/m ³)	Attainment	Attainment	0.100 ppm	Unclassified/Attainment	Unclassified/Attainment
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	Attainment	Attainment	0.053 ppm (100 µg/m ³)	Attainment	Attainment
Sulfur Dioxide	24 Hour	0.04 ppm (105 µg/m ³)	Attainment	Attainment	0.14 ppm (365 µg/m ³)	Unclassified	Unclassified
	1 Hour	0.25 ppm (655 µg/m ³)	Attainment	Attainment	0.075 ppm (196 µg/m ³)	Unclassified	Unclassified
Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	Unclassified	Unclassified	N/A	N/A	N/A
	24 Hour	50 µg/m ³	Non-attainment	Non-attainment	150 µg/m ³	Unclassified	Maintenance

Pollutant	Averaging Time	California			National		
		Standard	Calaveras County Attainment Status	San Joaquin County Attainment Status	Standard	Calaveras County Attainment Status	San Joaquin County Attainment Status
Particulate Matter Fine (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	Attainment	Non-attainment	12 µg/m ³	Unclassified	Non-attainment
	24 Hour	N/A	N/A	N/A	35 µg/m ³	Unclassified/Attainment	Non-attainment
Sulfates	24 Hour	25 µg/m ³	Attainment	Attainment	N/A	N/A	N/A
Lead	30 Day Average	1.5 µg/m ³	Attainment	Attainment	N/A	Unclassified/Attainment	Unclassified/Attainment
	Calendar Quarter	N/A	N/A	N/A	1.5 µg/m ³	Unclassified/Attainment	Unclassified/Attainment
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Unclassified	Unclassified	N/A	N/A	N/A
Vinyl Chloride (chloro-ethene)	24 Hour	0.010 ppm (26 µg/m ³)	Unclassified	Unclassified	N/A	N/A	N/A
Visibility Reducing particles	8 Hour (10:00 to 18:00 PST)	10-mile nominal visual range	Unclassified	Unclassified	N/A	N/A	N/A
µg/m ³ = micrograms per cubic meter; PST= Pacific Standard Time Source: CARB, 2020a; CARB, 2019b; U.S. EPA, 2020; U.S. EPA, 2019. Note: N/A indicates no standard has been set.							

The CCAPCD and SJVAPCD have developed rules and regulations to help achieve the NAAQS and CAAQS (CARB, 2019b; SJCOG, 2012b). Pertinent rules and regulations for CCAPCD include, but are not limited to:

- Regulation II – Prohibitions
 - Rule 202 – Visible Emissions
 - Rule 205 – Nuisance
 - Rule 207 – Particulate Matter
 - Rule 210 – Specific Contaminants
- Regulation III – Open Burning
- Regulation IV – Authority to Construct Regulations
- Regulation V – Permit to Operate Regulations
- Regulation IX – Air Toxics Control Measures

Pertinent rules and regulations for SJVAPCD include, but are not limited to:

- Regulation II – Permits
 - Rule 2010 – Permits Required
 - Rule 2092 – Standards for Permits to Operate
- Regulation IV – Prohibitions

- Rule 4101 – Visible Emissions
- Rule 4102 – Nuisance
- Rule 4103 – Open Burning
- Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters
- Rule 4201 – PM Concentration
- Rule 4202 – PM Emission Rate
- Rule 4203 – PM Emissions from Incineration of Combustible Refuse
- Regulation VII – Toxic Air Pollutants
- Regulation VIII – Fugitive PM₁₀ Prohibition
- Regulation IX – Mobile and Direct Sources

The SJVAPCD and CCAPCD have also set thresholds of significance for “criteria” pollutants, as shown respectively in **Table 3.3-3** and **Table 3.3-4** below. These thresholds allow for the determination of significant air quality impacts at a project-level scale. As shown, the SJVAPCD’s criteria for emissions from both nitrogen oxides (NO_x) and/or volatile organic compounds (VOC)¹ is 10 tons per year (SJVAPCD, 2015). For all criteria pollutants, emissions must not exceed 100 pounds per day. The CCAPCD established project-level significance thresholds for emissions of reactive organic gases (ROG)¹, NO_x, and PM₁₀. Project emissions that exceed these thresholds are considered to have a significant effect on regional air quality and attainment of NAAQS and CAAQS, and therefore require mitigation. Additionally, exposure of sensitive receptors to substantial pollutant concentrations are considered a significant impact.

TABLE 3.3-3 SJVAPCD THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS

Pollutant/Precursor	Construction Emissions (Tons/Yr)/(Lb/day)	Operational Emissions ¹ (Tons/Yr)/(Lb/day)
CO	100/100	100/100
NO _x	10/100	10/100
VOC	10/100	10/100
SO _x	27/100	27/100
PM ₁₀	15/100	15/100
PM _{2.5}	15/100	15/100
¹ Both Permitted and Non-Permitted Equipment and Activities Source: SJVAPCD 2015.		

TABLE 3.3-4 CCAPCD THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS

Pollutant	Construction Emissions (Lbs/day)	Operational Emissions (Lbs/day)
NO _x	150	150
ROG	150	150
PM ₁₀	150	150
Source: CC 2018. From CCAPCD's <i>Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects</i> .		

The CCAPCD has not established a threshold of significance for PM_{2.5}; however, because PM_{2.5} is a subset of PM₁₀, it is appropriate to also establish a threshold of 150 pounds per day of

¹ VOC are also referred to as Reactive Organic Gases (ROG). Preferred terminology varies by air district. SJVAPCD uses the term VOC, while CCAPCD uses the term ROG. The US EPA uses the term VOC.

PM_{2.5}. The CCAPCD portion of the State Implementation Plan (SIP) is presently under review by the US EPA for revisions related to VOCs and NO_x in non-attainment areas (EPA 2019). Additionally, CCAPCD has worked with the Amador Air District (AAD), to prepare attainment plans for PM and ozone emissions (CC, 2018).

The SJVAPCD adopted a 2018 Particulate Matter Plan for the 1997, 2006, and 2012 PM_{2.5} Standards to reduce overall PM, particularly PM_{2.5}, in order to achieve EPA attainment status. The Plan includes regulatory measures for stationary sources, such as industrial flares, internal combustion engines, boilers/steam generators, glass melting furnaces, and agricultural operations; as well as for construction equipment or practices, such as requiring catalyzed engines or watering of soil surfaces one or more times per day; and for mobile sources (SJVAPCD, 2018). Measures also address concentrated PM sources that create “hot spots,” such as residential wood burning and commercial charbroilers. The Plan includes public outreach measures as well as research on and demonstration of new clean air technologies for reducing emissions (SJVAPCD, 2018). These PM reduction efforts have proven effective: the number of days that air quality exceeded the federal 2006 24-hour PM_{2.5} Standard (35 µg/m³) dropped from approximately 130 days in 2002 to 50 days in 2017 (SJVAPCD, 2018). With compliance, the Plan is expected to reduce approximately 4.2 tons per day of directly-emitted PM_{2.5} and 173.5 tons per day of NO_x from the baseline year of 2013 to the final attainment year of 2025 (SJVAPCD, 2018).

SENSITIVE RECEPTORS

Sensitive receptors are places typically occupied for extended periods by individuals with greater susceptibility to air pollution’s hazardous effects (such as children, the elderly, the acutely ill, and the chronically ill). Land uses typically associated with sensitive receptors include residences, hospitals, medical clinics, schools, day care centers, playgrounds, retirement homes, and convalescent facilities where there is reasonable expectation of continuous human exposure to poor air quality standards (CARB 2020b).

The nearest sensitive receptors to the Proposed Project site are three residences located within 1,000 feet of the Proposed Project site. The nearest residence is approximately 325 feet southeast of the existing Bollea Road bridge.

3.3.3 IMPACT DISCUSSION

QUESTION A

A project is generally deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates set forth in the applicable air quality plan. Accordingly, a proposed project must be evaluated to determine whether it would generate population and employment growth, and if so, whether that growth would exceed the growth rates specified in the relevant air plans. The Proposed Project would replace an existing bridge, and would not introduce new housing or employment-related construction, and thus would not induce population or employment growth. Therefore, impacts to applicable air quality plans of the SJVAPCD and CCAPCD would be **less than significant**.

QUESTION B

Air quality impacts potentially associated with the Proposed Project include those resulting from short-term construction and demolition activities. Construction-related emissions could include exhaust from construction equipment and fugitive dust from land clearing, earthmoving, movement of vehicles, and wind erosion of exposed soil during construction. Construction of the project would result in short-term emissions and/or odors associated with construction equipment and dust from earthmoving activities.

Criteria pollutant emission thresholds for SJVAPCD and CCAPCD are 100 and 150 pounds per day, respectively, as noted in **Table 3.3-3** and **Table 3.3-4** above. Additionally, the SJVAPCD required that NO_x and ROG emissions are below 10 tons per year. As a bridge replacement project with a 0.32-acre staging area located directly adjacent to the existing bridge and construction of the bridge to occur on the existing road bed, the Proposed Project is not expected to require equipment or construction activities that would produce emissions in excess of these SJVAPCD and CCAPCD thresholds. Further, SJVAPCD fugitive dust control requirements for construction sites would apply to all earthmoving and ground-disturbing activities (Regulation VIII), which would reduce PM impacts to less than significant levels. Other emissions from construction and demolition equipment are not anticipated to be significant because they would be limited to the duration of project construction and would cease when the bridge is completed and the temporary bypass has been removed.

The Proposed Project was evaluated by Caltrans in conjunction with the federal funding obtained for project construction. According to the Transportation Air Quality Conformity Findings Checklist, the project is exempt from all project-level conformity requirements and all air quality conformity requirements have been met. Caltrans did not require additional air quality studies to determine whether additional mitigation measures were necessary. Further, the Proposed Project is classified as an Exempt Safety Project under 40 Code of Federal Regulations (CFR) 93.126, as “widening narrow pavements or reconstruction bridges (no additional travel lanes)”. Per the CFR, such projects can “proceed toward implementation even in the absence of a conforming transportation plan”.

Accordingly, with compliance with existing regulations, impacts associated with violations of air quality standards are anticipated to be less than significant. The Proposed Project would not violate air quality standards or substantially contribute to air quality violations. There would be a **less than significant impact**.

QUESTIONS C AND D

Construction of the Proposed Project could result in temporary emissions of pollutants from equipment and vehicles. Construction equipment also has the potential to emit odor in the vicinity of the Proposed Project site; however, construction odors are not anticipated to be detected beyond the Proposed Project site boundaries. Construction odors often dissipate quickly and are generally not noticeable off-site. As discussed above, as a bridge replacement project, the Proposed Project is not expected to require equipment or construction activities that would produce emissions in excess of the SJVAPCD and CCAPCD thresholds intended to determine potential significant impact of producing criteria air pollutants. Additionally, SJVAPCD

fugitive dust control requirements for construction sites (Regulation VIII) and SJVAPCD and CCAPCD PM regulations would apply to all construction and demolition activities, which would further reduce potential of transport of pollutants and odors from the Proposed Project site.

The nearest sensitive receptors to the Proposed Project site are residences located approximately 325 feet and 650 feet southeast of the Bollea Road bridge, respectively. While these sensitive receptors are in close proximity to the Proposed Project site, construction odors are not expected to be detected beyond the Proposed Project site. Construction activities would occur along the existing roadbed and 0.32-acre staging area adjacent to the existing bridge, and would require implementation of SJVAPCD and CCAPCD PM regulations and fugitive dust control measures. This would further reduce exposure of sensitive receptors to criteria pollutants.

The Proposed Project was evaluated by Caltrans in conjunction with the federal funding obtained for project construction. According to the Transportation Air Quality Conformity Findings Checklist, the project is exempt from all project-level conformity requirements and all air quality conformity requirements have been met. Caltrans did not require additional air quality studies to determine whether additional mitigation measures were necessary. Therefore, the Proposed Project would result in a **less than significant impact** of substantial pollutant concentrations affecting sensitive receptors or of objectionable odors that would affect a substantial number of people.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.4 BIOLOGICAL RESOURCES				
Would the project:				
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 CDFW or USFWS?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.4.1 ENVIRONMENTAL SETTING

The following summarizes special-status species, critical habitat/essential fish habitat, and describes the Proposed Project area setting. Results from the analysis were used in addressing the impacts and developing mitigation measures. A Biological Study Area (Proposed Project site) was developed to inventory biological resources, including habitat quality that could be affected by the Proposed Project, and existing disturbances. The Proposed Project site includes the project footprint of the Proposed Project Site, all access and staging areas, and lands beyond the footprint to the edge of the road right-of-way or that were determined necessary to inventory in order to perform an adequate analysis of Proposed Project impacts.

Critical Habitat

To determine if critical habitat, or essential fish habitat occurs on the project site, a National Marine Fisheries Service (NMFS) official Endangered Species Act species list was requested by Caltrans, the federal lead agency, as designated by FHWA, and San Joaquin County as the project proponent (nonfederal lead agency) and online mapper of listed Critical Habitat (CH). A California Native Diversity Database (CNDDDB) and United States Fish and Wildlife Service (USFWS) map was consulted for areas marked as critical habitat for listed species (see Appendix A of the NES (**Appendix C**)).

Special-Status Species

For the purposes of this assessment, special status has been defined to include those species that are:

- Listed as endangered or threatened under the Federal Endangered Species Act (FESA) (or formally proposed for, or candidates for, listing);
- Listed as endangered or threatened under the California Endangered Species Act (CESA) (or proposed for listing);
- Designated as endangered or rare, pursuant to California Fish and Wildlife (CDFW) Code (§1901);
- Designated as fully protected, pursuant to CDFW Code (§3511, §4700, or §5050);
- Designated as species of concern to the CDFW;
- Covered under the International Migratory Bird Treaty Act; or
- Defined as rare or endangered under CEQA.

An official special-status species list was generated from the U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) system, CDFW's CNDDDB, and the California Native Plant Society *Electronic Inventory of Rare and Endangered Plants* referencing the *Wallace* quadrangle and the eight surrounding quads: *Goose Creek, Lone, Jackson, Clements, Linden, Valley Springs, Valley Springs SW, and Jenny Lind* United States Geological Survey 7.5-minute quadrangles (see Appendix A of NES (**Appendix C**)). These lists identify three amphibian species, seven bird species, 17 flowering plant species, three invertebrate species, three fish species, and two reptile species with the potential to occur in the region of the Proposed Project site. Essential fish habitat and details for each special-status species with potential to occur are further discussed in **Appendix A**.

Habitats

The Proposed Project Site or Action Area, consists of the project footprint and includes the project impact area totaling 4.434 acres. This Action Area contains a variety of terrestrial and aquatic habitat types. These habitats include: ruderal grassland, riparian, ruderal/disturbed, riverine (Bear Creek), lacustrine (man-made pond), a topographic depression, and drainage ditches. A summary of total acreages, the temporary, permanent acres of each habitat type to be impacted by the preferred alternative (375-foot curve) within the Action Area are shown in **Table 3** below (Appendix A of **Appendix C**). A map that illustrates the terrestrial and aquatic

habitat types within the Action Area is presented Figure 4 of Appendix A of the NES (**Appendix C**).

TABLE 3.4-1. SUMMARY OF TEMPORARY AND PERMANENT EFFECTS BY HABITAT TYPE

Habitat Community	Acreage	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Ruderal Grassland	2.522	0.014	0.007	0.210
Riparian	0.445	0.008	0.002	0.010
Ruderal/Disturbed	1.090	0.065	0.382	0.447
Riverine (Bear Creek)	0.102	0.007	0.004	0.011
Lacustrine (man-made pond)	0.220	0.000	0.000	0.000
Topographic Depression	0.021	0.000	0.000	0.000
Drainage Ditch	0.034	0.00004	0.00001	0.0005
Total Acreage	4.434	0.094	0.395	0.489

3.4.2 Regulatory Setting

Federal Endangered Species Act (FESA) of 1973

Under FESA, the Secretary of the Interior and the Secretary of Commerce have the joint authority to list a species as threatened or endangered (16 United States Code [U.S.C.] 1533c). The purposes of FESA are to provide a means to conserve the ecosystems that endangered and threatened species depend on and to provide a program for conservation and recovery of the species with the intent of removing the species from a listed, protected status. Regulatory protection is given to any species listed as endangered or threatened.

The USFWS and the National Marine Fisheries Service (NMFS) are the federal agencies that enforce FESA. Pursuant to the requirements of FESA, an agency reviewing a project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the project area and determine whether the Proposed Project will have an impact on such species. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed for listing under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 U.S.C. 1536).

Migratory Bird Treaty Act (MBTA)

Migratory birds are protected under the federal MBTA of 1918 (16 U.S.C 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season.

Bald and Golden Eagle Protection Act

In addition to protection offered through the MBTA, bald and golden eagles receive special protection under the Bald and Golden Eagle Protection Act. The Bald Eagle Protection Act was originally enacted in 1940 to protect bald eagles and was later amended to include golden eagles (16 USC Subsection 668-668). It prohibits the taking or possession of and commerce in bald and golden eagles, parts, feathers, nests, or eggs with limited exceptions. Bald and golden eagles may not be taken for any purpose unless a permit is issued prior to the taking. The statute imposes criminal and civil sanctions as well as an enhanced penalty provision for subsequent offenses.

California Endangered Species Act (CESA)

Under CESA, it is unlawful to take a State-listed endangered or threatened species. Fish and Game Code section 86 defines take as “hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture or kill.” CESA take authorization, over CDFW, if there is potential for take of a State-listed plant or wildlife species.

California Department of Fish and Wildlife (CDFW)

California Law, Fish and Game Code sections 3503 and 3503.5 provide protection of birds and birds’ nests by prohibiting the take of birds, their nests, or their eggs. California Law, Fish and Game Code section 1600 et seq., requires notification to the CDFW for proposed projects that may: divert, obstruct, or change the natural flow or the bed, channel or bank of any river, stream, or lake; use material from a streambed; or result in the disposal or deposition of debris, waste, or other material where it may pass into any river stream, or lake.

CEQA Guidelines

Several federal and state statutes protect rare, threatened, and endangered species. The CEQA Guidelines Article 20, Section 15380 provides that a species not listed on the federal or state list of protected species may be considered rare, threatened, or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions of endangered, rare, or threatened provided in FESA and CESA. This section of the Guidelines gives public agencies the ability to protect a species from any potential impacts of proposed projects until the respective government agency has the opportunity to designate (list) a species as protected, if warranted.

The California Native Plant Society (CNPS) maintains an extensive list of plant species that it considers to be rare, threatened, or endangered, but have no designated status or protection under federal or state endangered species legislation. Impacts to CNPS listed species (e.g., CNPS list 1B and 2) are considered pursuant during CEQA environmental review.

3.4.3 Impact Discussion

Potential impacts to biological, wetlands or waters of the U.S. resources were evaluated in the following Project technical reports, which are incorporated herein:

- Biological Assessment (BA; **Appendix A**)

- Wetland Study / Jurisdictional Delineation Report (**Appendix B**)
- Natural Environmental Study (NES; **Appendix C**)

The NES is a standard Caltrans report for documenting and evaluating the potential Project impacts to biological resources. The BA is prepared to support Endangered Species Act consultation with United States Fish and Wildlife Services (USFWS) and National Marine Fisheries Service (NMFS). The Wetland Study / Jurisdictional Delineation Report, NES and BA conclude the following regarding special-status resources:

- Within the Proposed Project site, riverine (Bear Creek) habitat, and lacustrine (man-made pond) habitat are likely to be considered jurisdictional waters of the U.S.
- Suitable habitat for federal-listed California red-legged frog occurs (CRF, *Rana draytonii*), California tiger salamander (CTS, *Ambystoma californiense*), and valley elderberry longhorn beetle (VELB, *Desmocerus californicus dimorphus*) occurs within the Proposed Project site.
- Habitat within the Proposed Project site provides marginal suitable habitat for federally-listed lone manzanita (*Arctostaphylos myrtifolia*). No lone manzanita were observed during surveys conducted to determine its presence within the Proposed Project site.
- The Action Area does not contain habitat for any other federal-listed or federal-proposed species.
- Migratory birds and other birds of prey, protected under the MBTA (50 CFR 10), have the potential to nest within the Proposed Project site.
- The Action Area provides suitable habitat for state-listed, CFLF, CTS, and Swainson's hawk (*Buteo swainsoni*).
- California Department of Fish and Wildlife (CDFW) special-status species with suitable habitat in the Project Site include western pond turtle (*Emys marmorata*), and Hardhead (*Mylopharodon conocephalus*).
- The Action Area provides habitat for three special-status plants ranked by the California Native Plant Society (CNPS). No special-status plants were observed during reconnaissance surveys and focused botanical surveys conducted during the evident and identifiable period for special-status plants with potential to occur.
- The riparian habitat along Bear Creek in the Project Site is a habitat of significant biological and an ecological resource protected under the San Joaquin County General Plan, and CDFW pursuant to Section 1602 of the California Fish and Game Code (CFGF).

QUESTION A

Impacts to candidate, sensitive, or special status species in the Action Area consist of the following.

Special-status Plant Species

Surveys were conducted to determine the presence and/or potential for presence of special-status plant species within the Proposed Project site during the appropriate bloom season, and no special-status plant species were found to be present within the Proposed Project site. However, due to the presence of appropriate habitat for lone manzanita (*Arctostaphylos myrtifolia*), Hoover's calycadenia (*Calycadenia hooveri*), and Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*). Avoidance and minimization efforts BIO-4 through BIO-6, are recommended to reduce any unforeseeable potential impacts to a **less-than-significant** level in addition to mitigation measures BIO-1 through BIO-3.

California tiger salamander

California Tiger Salamanders (CTS: *Ambystoma californiense*) is a federal and state-listed threatened species. CTS require suitable aquatic habitat for breeding and upland habitat for estivation (dry-season hibernation). Aquatic breeding habitats, including vernal pools and seasonal and perennial ponds, are typically found in grassland habitats and oak savannah plant communities at elevations in the range of sea level to approximately 610 meters above sea level. CTS do not breed in fast-flowing ephemeral streams because eggs or larva would be washed away or may be exposed to predation. CTS do not use permanent pools because potential for predation of eggs or larvae stages exist where more permanent waters exist. Breeding typically occurs between December and March. CTS spend most of their lives in upland habitats, which consist of grassland and oak savannah burrows of small mammals such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*). They cannot dig or maintain their own burrows and consequently require the presence of burrowing mammals for burrow construction and maintenance.

There are 14 CNDDDB records within 5 miles of the Proposed Project site, the closest non-breeding sighting of which is located 0.2 miles away. CH for this species is identified approximately 4 miles to the southeast and approximately 4 miles to the northwest. No CTS were observed within the Proposed Project site during the biological survey on March 8, 2017. Although no ground squirrel population was observed during the site survey, low-quality burrows were found in several locations in the Proposed Project site within the ruderal/grassland habitats west of Bollea Rd. Two other locations west of the Proposed Project site were also identified as having low-quality burrows. While the pond habitat and topographic depression may provide suitable aquatic breeding habitat for CTS they are both well outside of the known breeding locations. Bear Creek is not considered suitable breeding habitat for CTS given that it is an intermittent, fast-flowing creek during the rainy season. No CTS or burrows were observed in or around the topographic depression. The man-made pond is fenced within private property and therefore was not surveyed for burrows or to verify if it is stocked with fish or it provides watering for livestock. No CTS were encountered in the topographic depression or within the entire

Proposed Project site. Construction activities associated with the Proposed Project could impact CTS, since low-quality estivation habitat for this species is present within the Proposed Project site, if it was to enter the project work limits. However, all burrow areas observed west of Bollea Road would not be impacted under the preferred alternative (Figure 5 of **Appendix A**). Direct and indirect impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Bio-1 through BIO-13**, would be implemented to reduce any potential impacts to CTS, including preconstruction surveys, worker awareness training conducted prior to construction initiation, and avoidance of habitat through the placement of exclusionary fencing around the impact area. With implementation of these measures, the Proposed Project would result in a determination of **may affect**, but **not likely to adversely affect** CTS.

California red-legged frog

California red-legged frogs (CRLF: *Rana aurora draytonii*) is a federal and state-listed threatened species and a CDFW species of special concern. CRLF require suitable aquatic habitat, embedded within a matrix of riparian and upland dispersal habitats, for breeding. Aquatic breeding habitats, including pools and backwaters within streams, creeks, ponds, marshes, springs, sag ponds, dune ponds, lagoons, and artificial impoundments, are typically found in upland habitats at elevations in the range of sea level to approximately 1160 meters above sea level. Breeding typically occurs between November and March and CRLF require 11-30 weeks of permanent water for larval development (CDFG, 2008). Beginning with the first rains of fall, CRLF make overland excursions through upland habitats at night and move up to 1.6 kilometers throughout one wet season. CRLF rest and forage in riparian vegetation and disperse from their aquatic breeding habitats to forage and seek summer habitat when water is not available (USFWS, 2002). Summer habitats include spaces under boulders or rocks and organic debris, such as downed trees or logs, industrial debris, and agricultural features, such as drains, water troughs, abandoned sheds, or hay-ricks (USFWS, 2002).

There are no CNDDDB records of CRLF within 5 miles of the Proposed Project site. Bear Creek is not a suitable aquatic habitat for breeding, given that it is a perennial, fast-flowing creek during the rainy season. The lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF. Construction activities associated with the Proposed Project could impact CRLF, since the lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF, and even though these areas are outside of the impact area, CRLF could pass through the construction areas while accessing these aquatic habitats if barriers to passage are not in place. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Bio-1 through BIO-13**, including preconstruction surveys, worker awareness training, and the placement of exclusionary fencing prior to construction initiation. With implementation of these measures, the Proposed Project would result in a determination of **may affect**, but **not likely to adversely affect** CRLF.

Swainson's hawk

Swainson's hawks (*Buteo swainsoni*), require suitable terrestrial habitat for nesting. Swainson's hawks arrive in the Central Valley and nest peripherally in valley riparian systems, as well as in lone trees or groves of trees in agricultural fields. Suitable habitat for nesting, including Valley oak, Fremont cottonwood, walnut, and willow trees, are typically found in riparian and grassland habitats at elevations in the range of 41 to 82 feet above sea level. Nesting typically occurs between March and August. Breeding pairs construct nests composed of sticks, leaves, and bark. Eggs are laid from mid- to late-April and are incubated into mid-May when young begin to hatch. Young remain near the nest and depend on adults for approximately four weeks after fledging until they permanently leave the breeding territory. Swainson's hawks feed on small mammals, birds, and insects; young are fed rodents, rabbits, and reptiles. When not breeding, Swainson's hawks are atypical because they are almost exclusively insectivorous (England et al., 1997). Typical foraging habitat includes annual grasslands, alfalfa, and other dry farm crops that provide suitable habitat for small mammals.

Suitable foraging habitat nearby nesting sites is critical for fledging success. No raptor nests were observed within or adjacent to the Proposed Project site. There are five CNDDDB records of Swainson's hawks within 5 miles of the Proposed Project site. Construction activities associated with the Proposed Project could impact Swainson's hawks, since habitat for this species may be present within the Proposed Project site, if it was to enter the project work limits. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Bio-1 through BIO-13**, including preconstruction nesting surveys and worker awareness training conducted prior to construction initiation. With implementation of these measures, the Proposed Project would have **no impacts** to Swainson's hawks.

Hardhead (*Mylopharodon conocephalus*)

Hardhead was designated as a species of special concern by CDFW in 1995 and is listed as a Class 3 Watch List Species by CDFW. There is no CNDDDB record within 5 miles of the Proposed Project site. Bear Creek may provide suitable aquatic habitat for this species within the Proposed Project site during high levels of precipitation. Construction activities associated with the Proposed Project could impact hardhead, since habitat for this species may be present within the Proposed Project site, if it was to enter the project work limits. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts **Bio-1 through BIO-13**, as these measures will eliminate the chance of fish being present within the construction area. With implementation of these measures, the Proposed Project would have **no impacts** to hardhead.

Steelhead (*Oncorhynchus mykiss*) – Central Valley distinct population segment

Central Valley steelhead distinct population segment (DPS) is a federal-listed threatened species. There is one CNDDDB record within 5 miles of the Proposed Project site on the Mokelumne River, downstream of the Camanche Dam to the southwest of the Project Site. Bear Creek is not designated CH or EFH for Central Valley steelhead but suitable aquatic

habitat may be present in the Proposed Project site during high levels of precipitation (USFWS 2019a, NOAA, 2019a). In addition several potential fish barriers that could impede steelhead access were identified downstream of Bear Creek (CDFW, 2019b). CH for this species exists within 5 miles of the Proposed Project site, approximately 4.75 miles to the northwest. Construction activities will not impact Steelhead due the presence of multiple fish barriers downstream and the lack of flowing water through the Proposed Project site during the dry season which make the Project inaccessible to Steelhead. Avoidance measures **Bio-1 through BIO-13**, will ensure there will be no adverse effect to Steelhead downstream of the Proposed Project site. There will be **no effect** to Central Valley Steelhead.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

The valley elderberry longhorn beetle (VELB) is a federal-listed threatened and CDFW species of special concern. VELB completely dependent on its host plant, elderberry (*Sambucus* spp.), in and around California's Central Valley during its entire life cycle (USFWS, 1984). USFWS has designated Critical Habitat for this species in Sacramento County. There are two CNDDDB records of VELB within 5 miles of the Proposed Project site. One record is located one mile to the north east (#210) and the second is approximately 4.75 miles to the west (#160). There is no CH within 5 miles of the project site. Riparian habitat along Bear Creek and the northwestern portion of the Proposed Project site contains potentially suitable habitat for VELB.

Although suitable habitat for this species is present within the Proposed Project site, construction activities associated with the Proposed Project will not impact VELB since all known elderberry shrubs will be completely avoided. Direct and indirect impacts to this species would be avoided through the implementation of avoidance and minimization measures **Bio-1 through BIO-13**, including worker awareness training conducted prior to construction initiation, and avoidance of elderberry shrubs through the placement of exclusionary fencing 20 feet from any shrub. With implementation of these measures, the Proposed Project would result in a determination of ***may affect, but not likely to adversely affect VELB.***

Western pond turtle

Western pond turtle (*Actinemys marmorata*), is a CDFW species of special concern. There is one CNDDDB records of western pond turtles within 5 miles of the Proposed Project site. Bear Creek is not a suitable aquatic habitat for breeding, given that it is a perennial, fast-flowing creek during the rainy season. The uplands adjacent to the lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for western pond turtle. Construction activities associated with the Proposed Project could impact western pond turtles, since habitat for this species may be present within the Proposed Project site, if it was to enter the project work limits. Direct impacts to this species would be avoided through the implementation of avoidance and minimization measures outlined in **Bio-1 through BIO-13**, will eliminate the chance of western pond turtle being present within the construction area. With implementation of these measures, the Proposed Project would have **no impacts** to western pond turtles.

Migratory Birds and Other Birds of Prey

The following avoidance and minimization measures shall be implemented to avoid project-related impacts to nest sites for birds of prey and migratory birds. In addition to the avoidance measures **BIO-3 through BIO-13**, measures **BIO-14 and BIO-15**, would help avoid project-related impacts to migratory birds. Implementation of Avoidance and Minimization Measures BIO-1 through BIO-15 would reduce impacts on sensitive species to less than significant. **Less than Significant with Mitigation.**

QUESTION B

Natural communities of concern (i.e. riparian, wetlands, and oak woodlands) are considered sensitive under CEQA and may be regulated by the CDFW pursuant to Section 1602 of the California Fish and Game Code (CFGF). Riparian communities and wetlands may also be regulated by the USACE and/or Regional Water Quality Control Board (RWQCB) if the community is determined to be waters of the United States, or waters of the State.

Riparian Habitat

Proposed Project designs would result in 0.002 acres of permanent impacts and 0.008 acres of temporary impact to riparian habitat under the preferred alternative. Impacts from the Proposed Project and associated stream bank stabilization of Bear Creek would be a net positive to this habitat. Riparian areas may be indirectly affected by stormwater runoff during construction. With implementation of avoidance and minimization efforts **BIO-1 through BIO-4**, and all applicable conditions within the permits shall ensure that impacts to riparian habitat would be less than significant. **Less than Significant with Mitigation.**

QUESTION C

A preliminary jurisdictional delineation has been prepared to identify jurisdictional Waters within the Proposed Project site (**Appendix B**). The preliminary jurisdictional delineation report identifies riverine (Bear Creek) habitat and the lacustrine habitat as the only Waters of the U.S. within the Proposed Project site; no wetlands were identified. The proposed Project would impact non-wetland waters subject to regulation by the USACE, RWQCB, and CDFW as discussed above under Question B. **Less than Significant.**

QUESTION D

Construction of the new bridge would not interfere with any movement corridors or the movement of any native resident or migratory fish or wildlife species. The Proposed Project would result in a net positive for any native resident or migratory fish or wildlife species, as the current conditions force the water from Bear Creek through a set of culverts under a temporary road, which will be removed.

Nesting habitat for migratory birds and other birds of prey protected under the MBTA may include the trees scheduled for removal within the project site and vicinity. Potential disruption of nesting migratory birds and other birds of prey during construction could result in nest abandonment or mortality. Disturbance of migratory birds during nesting season (February 1 to

August 31) could result in “take”, which is prohibited under the Migratory Bird Treaty Act and Section 3513 of the CFGC. Implementation of avoidance measures **BIO-1 through BIO-15** would reduce impacts to less than significant. **Less than Significant with Mitigation**

QUESTION E

The Proposed Project is subject to Goal NCR-2.1 of County of San Joaquin General Plan (San Joaquin County 2016). Impacts to riparian habitat will be minimized to the maximum extent possible. The Proposed Project would not conflict with any other ordinances, plans or policies protecting biological resources. With implementation of avoidance measures **BIO-1 through BIO-15** would reduce impacts to less than significant. **Less than Significant with Mitigation**

QUESTION F

The Proposed Project is not subject to any approved local, regional, or state habitat conservation plan and thus would not affect any such plans or areas. **No Impact.**

MITIGATION MEASURES

BIO-1: Obtain All Required Permits

Prior to construction, the Proposed Project shall obtain all required permits. Permits may include, but not be limited to, the following: CDFW Section 1602 permit, a USACE Section 404 permit, and a RWQCB Section 401 permit. Coverage under a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Construction General Permit (CGP), Order 2009-009-DWQ. All conditions within the issued permits shall be adhered to.

BIO-2: Limit In-Stream Work to Dry Season

All in-stream construction activities shall be performed during the dry season, defined as the timeframe between June 15 and October 31, or the first significant rainfall, whichever comes first. This period coincides with the time of year when Bear Creek has little to no flow. The required permits are anticipated to include provisions for any required ensuring dewatering does not impact the stream, removal of fill within the stream, and sediment control during and immediately after the work.

If the work site needs to be temporarily dewatered by pumping, water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any diversion or barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

Alternation of the stream bed will be minimized to the maximum extent possible; any imported material will be removed from the stream bed upon completion of the project.

BIO-3: Restoration of Stream Channel after Construction

Before the end of construction, any work done to the new bridge alignment within the Bear Creek stream channel and during the removal of the temporary bypass road, the stream channel shall be restored to a condition allowing for connectivity of the Ordinary

High Water Mark (OHWM) and the bed and bank between the upstream and downstream sections of the Proposed Project site. All temporarily disturbed areas shall be returned to pre-project conditions upon completion of construction, including habitat contours. These areas will be properly protected from washout and erosion using appropriate erosion control devices including coir netting, hydroseeding, and revegetation. The un-impacted areas above and below the work areas will serve as baseline for restoration evaluation.

BIO-4: Demarcate Work Area Boundary

In consultation with a qualified biologist, construction personnel shall demarcate the outer perimeter of the surveyed work area to prevent damage to adjacent habitat even though no suitable for special-status species were seen there during the detailed survey of the Proposed Project site. This fencing shall provide visual orientation to its limits of the work and survey cleared areas. Material appropriate for creating a barrier for animal species, such as properly installed silt fencing, shall be used, shall be installed prior to the start of construction, and shall be maintained in place and in good working order during all periods of construction. All persons employed or otherwise working on the project site shall be instructed about the restrictions that the marking represents.

BIO-5: Conduct Preconstruction Surveys for Special-Status Plant Species

To re-verify the absence of listed plants within the impact area, a qualified biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines no less than 14 days prior to initiating ground-disturbing activities for the following special-status species: lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush. If any unanticipated evidence of species presence is found during the preconstruction survey, the biologist shall contact the County within one day following the survey and contact CDFW and/or USFWS for consultation on the identified species. All requirements provided by CDFW and/or USFWS at the time of consultation shall be adhered to.

BIO-6: Conduct Environmental Awareness Training for Special-Status Species

Prior to construction commencement, all construction personnel shall participate in environmental awareness training regarding identification, descriptions, behavior and habitat indicators for all special-status species with the potential to be found within the Proposed Project site. If new construction personnel are added, they must receive the mandatory training prior to initiating work. As part of the training, an environmental awareness handout shall be distributed to all personnel that describes and illustrates all special-status animal species with the potential to occur within the Proposed Project site. In addition information on general measures that will be taken to protect these species as they relate to the Proposed Project, the penalties for non-compliance, and the boundaries of the Proposed Project site will be included. The handout shall also list any applicable permit conditions provided by each regulatory agency. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

BIO-7: Avoidance and Minimization Measure for California Tiger Salamander

While no impacts are anticipated, the following measures shall be implemented to avoid and minimize adverse effects to CTS as a result of the Proposed Project:

- No less than 14 days prior to initiating ground-disturbing activities, a Service-approved biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines for CTS or burrows capable of supporting CTS estivation or as refugia. These areas will be clearly marked and avoided by at least 50 feet. In accordance with mitigation measure **BIO-4**, will be fenced with appropriate exclusion fencing to avoid CTS from inadvertently accessing the construction area. It is anticipated that all low quality burrows will thus also be avoided. If the burrows cannot be avoided, Caltrans will contact the Service to discuss additional measures that may be needed and obtain an Incidental Take Statement if needed.
- Prior to the start of construction activities, a Service-approved biologist will provide education and training sessions for all individuals that will be involved with site preparation or construction. The training will focus on habitat sensitivity and identification of salamanders. The training will include species description and behavior, general measures that will be taken to protect these species as they relate to the proposed project, the penalties for non-compliance, and the boundaries of the proposed project site. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
- Construction activities will be timed to occur during the dry season (May 1 - October 15) between 30 minutes after sunrise to 30 minutes before sunset to minimize potential effects to salamander dispersal. Work will not be conducted if raining. A Service-approved biologist will check the National Weather Service prior to each scheduled work day. No construction activities will be conducted in upland habitat areas where salamanders may occur if it is raining, if there is a greater than 70% chance of rain based on the National Oceanic and Atmospheric Administration's National Weather Service forecast on that work day, or within 48 hours following a rain even greater than 0.25 inch.
- The contractor will confine all equipment to designated work zones (including access roads and material/ equipment storage and staging area).
- All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from any water body.
- All construction pipe, culverts, or similar structures that are laid underground or stored at the construction site for one or more overnight periods will be capped or covered in a manner that excludes salamanders from entering the pipe. Long-term storage of pipes and other construction material should be placed on asphalt and raised above the ground by no less than 1.5 inches. All pipes shall be thoroughly inspected before being moved, buried, or capped. If during inspected a CTS is discovered inside a pipe, that

section of pipe shall not be moved until the salamander has escaped on its own or USFWS and CDFW will be contacted for further instruction.

- Project personnel will exercise caution when commuting to the construction area to minimize any chance for the inadvertent injury or mortality of species encountered on major roads leading to and from the construction area. Project-related vehicles and equipment will not exceed 20 mph in the action area.
- Vehicles and equipment will be thoroughly inspected for the presence of CTS prior to movement. If a CTS is found, USFWS and CDFW shall be contacted for further guidance. No equipment will be moved until the CTS have left voluntarily.
- Excavated areas 6 inches deep or more will be covered in a manner that exclude salamander or will be provided with escape ramps at a 3:1 slope. No gaps greater than 1 inch will be allowed within cover materials. Each covered excavation should be checked daily until the excavation is filled.
- All stakes, flagging, and fencing used to delineate the construction area will be removed no later than 30 days after construction and restoration are complete.
- A litter control program shall be instituted at the entire Project site. Contractors will provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage will be removed daily from the Project site.
- All fencing, flagging, debris, trash, and materials from work areas will be removed following completion of construction and habitat restoration activities.
- The USFWS- and CDFW-approved biologist shall have oversight over the implementation of all conservation measures, and shall have the authority to stop Project activities if any of the requirements associated with these measures are not being fulfilled.
- While highly unlikely, in the case of injured and/or dead CTS, USFWS and CDFW shall be notified of events within one day and the animals shall only be handled by a USFWS- and CDFW-approved biologist. Injured CTS shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal shall be preserved and held in a secure location until instructions are received from the USFWS and CDFW regarding the disposition of the specimen or until USFWS or CDFW takes custody of the specimen. The applicant must report to USFWS and CDFW within one calendar day any information about take or suspected take of CTS. Notification must include the date, time, and location of the incident or of the finding of a dead or injured CTS. Work will stop immediately if an incident occurs until corrective actions are provided by the USFWS.

BIO-8: Avoidance and Minimization Measure for California Red-Legged Frog

In conjunction with avoidance and minimization measures **Bio-1 through BIO-6** those listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to CRLF as a result of the Project:

- Before the project activities begin, all construction personnel shall attend a Worker Environmental Awareness Training session conducted by a Service-approved biologist. The session shall describe CRLF and its habitat, address proper implementation of avoidance measures, and clarify the boundaries within which the project may be accomplished
- While there are no sightings within 5 miles to be safe, the potential breeding habitats, including the pond and topographic depression, shall be avoided as part of project design. In accordance with mitigation measure **BIO-4**, these habitats will be fenced off with barrier material to prevent CRLF from moving into the project site. This barrier will be constructed out of properly-installed silt fencing or an equivalent material to prevent movement of amphibians into the project site.
- Prior to commencing site disturbance, including vegetation and/ or ground disturbance, a Service-approved biologist(s) will be identified to monitor implementation of biological mitigation measures. The Service-approved biologist will be present for all initial ground disturbing activities.
- If any CRLF are observed in the Project work limits during construction, work will immediately stop, and the CRLF will be allowed to move out of harm's way on its own accord, and the Service will be contacted within 24 hours to reinitiate consultation.

BIO-9: Avoidance and Minimization Measure for Swainson's hawk

If construction is to begin within the nesting season (March 15 to October 15), a survey for nesting Swainson's hawks will occur within a 500-foot buffer of, and including, the Proposed Project site within 14 days of the start of construction. Using standard nest-searching methods, a qualified biologist will determine whether any nesting Swainson's hawks occur within this area. If any active nests are located, coordination with the CDFW will occur to determine the appropriate buffer for construction activities and timing of work within that buffer. If a gap in construction activities of greater than 14 days occurs, or 14 days lapses from the time of survey to the start of construction, an additional survey for nesting birds will occur following the same protocols.

BIO-10: Avoidance and Minimization Measure for Hardhead

To ensure no impacts on hardhead, all work within the delineated stream boundary shall be limited to the timeframe between June 15 and October 31, or the first significant rainfall, whichever comes first.

BIO-11: Avoidance and Minimization Measure for Hardhead

While presence is unlikely, avoid any potential impacts of the project on hardhead, **BIO-10** shall be used as an avoidance and minimization measure.

BIO-12: Avoidance and Minimization Measure for VELB

In conjunction with avoidance and minimization measures listed in **Bio-1 through BIO-6** and those listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to VELB as a result of the Project:

- In addition to mitigation measure **BIO-4**, prior to initiating construction, highly visible fencing will be installed at the 20-foot setback around the perimeter of each elderberry plant or plant group. ESA fencing will consist of highly visible construction fencing or equivalent, and will be maintained until construction is complete. A qualified biologist will be present during the installation of fencing. If a minimum 20-foot setback from the dripline of all elderberry plants in the Action Area cannot be maintained for all project activities, the Service will be contacted and additional mitigation measures may be required
- Signs will be erected every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be clearly readable from a distance of 20 feet, and will be maintained for the duration of construction.
- In conjunction with avoidance and minimization measure BIO-6, an employee awareness training will be provided for the contractor the status of VELB, and emphasize the need to avoid impacting its habitat and host elderberry shrubs, and the possible penalties for not complying with these requirements.
- A qualified biologist will periodically inspect the construction area to assure that fencing and signs are intact and that the two elderberry shrubs adjacent to the proposed project are being avoided.
- No insecticides, fertilizers, or other chemicals that might harm the beetle or elderberry plants will be used within 100 feet of any elderberry plant with stems measuring greater than 1-inch in diameter. Herbicides may be used within 100 feet at the discretion of the permitting agencies. Any damage occurring within the elderberry buffer areas (within 100 foot of the elderberry plants) will be restored and revegetated with appropriate native species at the completion of construction.
- As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, should be conducted outside of the flight season of the VELB (March – July).

BIO-13: Avoidance and Minimization Measure for Western Pond Turtle

While the presence of the western pond turtle is unlikely, to reduce any potential impacts of the project on western pond turtle, **BIO-8** and **BIO-4** shall be used as an avoidance measures.

BIO-14: Install Exclusionary Netting beneath the Existing Bridge

To prevent potential impacts to nesting birds or roosting bats, the underside of the existing bridge shall be netted with tightly strung netting with less than half-inch mesh and no opening greater than half-inch along any seams, transitions, or connection points with the bridge during the timeframe from late October through early March. Netting shall be checked weekly and repairs made immediately. Demolition and removal of the

existing bridge shall only be initiated after the bridge has been confirmed to be free of roosting bats and nesting migratory birds.

BIO-15: Conduct Preconstruction Surveys for Active Nests

A qualified biologist shall conduct a preconstruction survey for active nests should construction commence during the nesting season for birds of prey and migratory birds (between February 15 and September 1). Cavities within trees proposed to be removed shall be surveyed for nesting birds. The preconstruction survey will be conducted within 14 days prior to commencement of construction activities. If surveys show that there is no evidence of nests, then no additional mitigation will be required so long as construction commences within 14 days of the survey.

If any active nests are located within the study area, a buffer zone shall be established by a qualified biologist around the nests. The biologist shall delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of breeding season or the young have fledged. Consultation with CDFW will be requested if establishing a 250-foot buffer zone is impractical.

Trees anticipated for removal should be removed prior to nesting season. The dates outside of the nesting season include from September 2 to February 14. If trees are anticipated to be removed during the nesting season, a preconstruction survey shall be conducted by a qualified biologist. If the survey shows that there is no evidence of active nests, then the tree shall be removed within ten days following the survey. If active nests are located within trees identified for removal, a 250-foot buffer shall be installed around the tree by a qualified biologist. Consultation with CDFW will be requested if establishing a 250-foot buffer zone is impractical.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.5 CULTURAL RESOURCES				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.5.1 ENVIRONMENTAL SETTING

PREHISTORIC SETTING

Prehistorically, regional drainages would have offered variations in biotic zones. The dominant natural vegetative communities in the project region would have been California steppe, prairie grasslands, and tule marshes, with some areas of riparian woodland (**Appendix D**). Valley oak, cottonwood, sycamore, and willows once grew on the verge of streams and rivers. Tule marshes were represented by stands of tules, cattails, sedges, rushes, and clumps of willows. Vegetation tended to be sparse in the prairie grasslands, limited to grasses and flowering herbs. However, a single valley oak could produce 300–500 pounds of acorns each year and tule roots could be ground into meal to supplement the abundant faunal resources (**Appendix D**) as well as supplying reeds for housing, clothing, rafts, and baskets. Native Americans burned off the grasslands annually to increase the following year's seed crop (**Appendix D**).

Faunal species that frequented the prehistoric prairie grasslands and tule marshes included mule deer, tule elk, pronghorn antelope, weasel, river otter, raccoon, and beaver. Migratory waterfowl such as Canada geese and swans passed through during the winter, joining great blue and black-crowned herons, ibis, cranes, cormorants, and bald eagles. Badgers, coyotes, skunks, jackrabbits, and cottontail rabbits inhabited higher ground. In the waterways, Chinook salmon, steelhead trout, Pacific lamprey, and white sturgeon seasonally joined other fish species indigenous to the region. Predators such as mountain lions, grizzly bears, wolves, kit fox, and bobcats also roamed the area (**Appendix D**).

The San Joaquin Valley was a focus of early research in California. Archaeological work during the 1920s and 1930s led to the cultural chronology for central California presented by Lillard, Heizer, and Fenenga in 1939 (**Appendix D**). They identified three archaeological cultures, named Early, Transitional, and Late (**Appendix D**). Heizer (1949) added subsequent refinements, but Beardsley (1948, 1954) developed the Central California Taxonomic System (CCTS), proposing a sequence of cultural succession in Central California defined by cultural changes (**Appendix D**). More recently, Fredrickson and Rosenthal et al. have added further refinements, including correlating sequences within the Archaic Period with climate changes (**Appendix D**). These periods are detailed below.

The **Paleo-Indian Period (12,000 to 8000 B.P.)** saw the first demonstrated entry and spread of humans into California. Sites were situated along lake shores, and a developed milling tool technology may have existed during this period. Social units were not heavily dependent upon exchange of resources, with exchange activities occurring on an ad hoc, individual basis. Most resources were acquired by seasonal migration calculated to take advantage of appropriate habitats. Characteristic artifacts included fluted projectile points and chipped stone crescents (**Appendix D**).

The beginning of the **Lower Archaic Period (8000 to 5000 B.P.)** coincided with a middle Holocene climatic change to generally drier conditions. Subsistence was focused on the consumption of plant foods over those obtained by hunting. Settlement appears to have been semi-sedentary with little emphasis on wealth. Most tools were manufactured of local materials, and exchange activities remained limited. Distinctive artifact types included large dart points and the milling slab and handstone (**Appendix D**).

The **Middle Archaic Period (5000 to 3000 B.P.)** began at the end of mid-Holocene climatic conditions when the climate became similar to present-day conditions. Cultural change was primarily in response to this changing environment. Economies were more diversified, possibly with the introduction of acorn technology. Hunting remained an important source of food. Sedentism became more fully developed and there was general population growth and expansion, but there is little evidence for development of regularized exchange relationships. Artifacts diagnostic of this period include the bowl mortar and pestle and the continued use of large projectile points (**Appendix D**).

The growth of sociopolitical complexity marked the **Upper Archaic Period (3000 to 1500 B.P.)**. The development of status distinctions based upon wealth has been well documented. There was greater complexity of exchange systems with evidence of regular, sustained trading between groups. Shell beads gained in significance as possible indicators of personal status and as important trade items. Groups who occupied the lowland valleys of central California appear to have lived in comparatively high- density villages, utilized a broad range of specialized technologies, and worked logistically from permanent or semi-permanent settlements. Group-oriented religions emerged and may be the origins of the Kuksu religious system at the end of the period (**Appendix D**).

Sometime after about 800 years ago, a significant change in obsidian production and exchange is recognized throughout central California. In the Northern San Joaquin Valley, this change is identified through shifts in obsidian source frequencies. Napa Valley obsidian becomes the primary source material used in this region, supplanting material obtained from eastern quarries (**Appendix D**). Haliotis ornaments and large quantities of shell beads manufactured in southern California and along the central and northern California coast are found in residential sites throughout the Sacramento Valley and lower foothills of the Sierra and Coast ranges. Clam shell disk beads occur widely throughout the Central Valley and adjacent foothills (**Appendix D**).

Several technological and social changes distinguish the **Emergent Period (1500 A.D. to 200 B.P.)**. The bow and arrow were introduced, ultimately replacing the dart and atlatl. Territorial boundaries between groups became well established and resembled those documented in the ethnographic literature. It became increasingly common that distinctions in an individual's social status could be linked to acquired wealth. Exchange of goods between groups became more regularized and increasingly sophisticated after AD 1500. The clamshell disk bead was adopted as a monetary unit for exchange, and increasing quantities of goods moved greater distances. It was during the latter decades of this period that large-scale Euroamerican-related impacts to Native American groups took place (**Appendix D**).

HISTORIC SETTING

Gabriel Moraga led a series of expeditions into Fresno County in the early 19th century while in search of appropriate sites for Spanish missions. Later exploration by John C. Fremont and Kit Carson followed. However, European settlement began in earnest with the Gold Rush, when miners began working along the San Joaquin River. The miners soon recognized the agricultural potential of the land and turned to grain farming, orchards, and ranching. Arable land was found along the major river corridors and valley bottom, while cattle and sheep ranching was established in the foothills (**Appendix D**).

One of the key components to the settlement of the region arrived in the 1870s, when the Central Pacific Railroad constructed its line through the San Joaquin Valley to reach Southern California. This revolutionized the transportation network, passenger travel, and the ability of farmers and ranchers to sell their goods in distant markets. During the late 1800s, the San Joaquin Valley became the center of California's wheat belt. While ranching remained an important industry, large-scale irrigation in the early 1900s led to diversified crops and orchards (**Appendix D**).

RESEARCH METHODS

A cultural resources record search was performed by the Central California Information Center (CCIC) of the California Historical Resources Information System on February 27, 2017 (**Appendix D**). The record search encompassed a 0.5-mile radius around the Proposed Project site. The CCIC reviewed maps showing recorded cultural resource sites and lists of cultural resource studies carried out in the area. This record search included, but was not necessarily restricted, to a review of the National Register of Historic Places (NRHP), California Inventory of Historical Resources, the Office of Historic Preservation (OHP) Archaeological Determinations

of Eligibility, and the OHP Directory of Properties in the Historic Property Data File. This last directory includes information relating to the NRHP, California Register of Historical Resources (CRHR), California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys. The CCIC found that one cultural resource has been previously recorded within the Proposed Project site, the Kentucky House Branch segment of the Southern Pacific Railroad (SPRR) and that five other resources have been documented within 0.5 miles (**Table 3.5-1**). Because the project lies within two counties, the SPRR Kentucky House Branch has two different trinomials (**Appendix D**).

The current bridge was erected in 1998 and intended to be a temporary replacement for an older bridge.

TABLE 3.5-1 ARCHAEOLOGICAL SITES WITHIN 0.5 MILES OF PROJECT SITE

Site Trinomial	Site Primary Number	Site Description	Recorders	Year	Within Project Site	Previous Evaluation for NRHP/CRHR
CA-CAL-1757, CA-CAL-1451H	P-05-1757	Kentucky House Branch, SPRR bed	Foothill Resources; Newland et al.; ARC; L. Harville; R. Werner; P. Hampson	2006, 2003, 2001, 1999, 1995, 1994, 1993	Yes	6Y (found ineligible for NRHP by consensus through Section 106 process)
CA-SJO-250H	P-39- 00002	Southern Pacific San Joaquin Valley Mainline	Foundations, debris scatters, railroad, walls	2012, 2011, 2010, 2008, 2007, 2006, 2005, 2003, 2002, 2001, 1997, 1994	Yes	
	P-39-3075	Roberts residence	L. Crow	2003	No	
	P-39-3077	Culvert	P. Hampson	2003	No	
	P-39-3078	Culvert	P. Hampson	2003	No	
CA-CAL-2060H	P-39-3384	Machinery base	Peak & Associates	2006	No	

Source: **Appendix D**.

The record search also identified three reports pertaining to archaeological studies within the Proposed Project site and another five within 0.5 miles (**Table 3.5-2**); again, because the project spans two counties, some reports have two separate identification numbers.

TABLE 3.5-2 PREVIOUS CULTURAL RESOURCE STUDIES WITHIN 0.5 MILES OF PROJECT SITE

Report Number	Author	Date	Summary Title	Within Project Site
CA-142/ SJ- 142	Derr, E.H.	1981	Underground Cable Project, Highway 12, Clements (Junction Highway 88) to San Andreas, Calaveras and San Joaquin Counties, California.	Yes
CA-1970	Napton, L.K.	1993	Cultural Resources Investigations of the Proposed Pacific Bell Fiber Optic Cable Installation Project, Amador, Calaveras and San Joaquin Counties, California.	No
CA-3379/ SJ-3379	Southern Pacific Transportation Co.	1994	Historic Report (49 C.F.R. 1105.8) Southern Pacific Transportation Company Proposed Abandonment In San Joaquin and Calaveras Counties, California ICC Docket No. AB-12 (Sub-No. 155X).	Yes
CA-5342/ SJ-5342	Wagers, J.C.	1975	The San Joaquin and Sierra Nevada Railroad. Las Calaveras, Quarterly Bulletin of the Calaveras County Historical Society, Vol. XI, No. 3, pages 81-90	Yes
CA-5739	Mampson, R., R. Werner, L. Crow	2003	Positive Archaeological Survey for Caltrans Encroachment Permit, Portion of Highway 12 Near Wallace, California, Mokelumne Oaks II Tentative Subdivision, 10- CAL-12, P.M. 1.1/1.6.	No
CA-6460	Peak & Assoc.	2007	Determination of Eligibility and Effect for the Wallace Lake Estates Project Area, Calaveras County, California.	No
CA-6591	Werner, R.	2005	Results of Cultural Resources Record Search, Windshield Survey, and Limited Prefield Research for Higgins Ranch, Wallace, California.	No
SJ-7205	Michael Brandman Associates	2010	Draft Section 106 Cultural Resources Assessment, Knife River Corporation Mine Expansion, San Joaquin and Calaveras Counties, California.	No
Source: Appendix D.				

Historic maps examined include the 1845 Official Map of Calaveras County, California; 1852-1870 General Land Office (GLO) Plat map; 1883 Town of Wallace map; 1962 Valley Springs 15' USGS quadrangle; and 1962 Wallace 7.5' USGS quadrangle. The historic maps did not indicate any development within the Proposed Project site. GLO Land Patent records show that the 120 acres of the southeast quarter of the southeast quarter of Township 4 North, Range 9 East Section 16 (which encompasses the Proposed Project site) was patented to Russell Hitchcock in 1864 (**Appendix D**). Hitchcock, originally from Ohio, is listed on the 1867 voter registry as a farmer living in Stockton though on the 1870 federal census, his residence is San Andreas, in Calaveras County (**Appendix D**).

A query was emailed to the San Joaquin County Historical Society (SJCHS) on March 13, 2017, asking if SJCHS provides background research; the reply from the outgoing archivist stated that they do not provide these services. Therefore, the SJCHS website was examined for background materials, context statements, or other relevant information. The SJCHS publishes a quarterly magazine, the San Joaquin Historian, copies of which are available on the SJCHS website. Two of these contained information on the branch of the railroad crossing the Proposed Project site, variously identified as the San Joaquin and Sierra Rail Road (**Appendix D**), the Southern Pacific Railroad, and the San Joaquin and Sierra Nevada Railroad (**Appendix D**). These are all the same facility, the San Joaquin and Sierra Rail Road which, after a short period of service, was purchased by the Central Pacific Railroad, and which subsequently became part of the Southern Pacific Railroad (**Appendix D**).

Letcher (1969) stated that the rail line was originally intended to run from Stockton to Lodi, then over the Sierras, stopping at Calaveras Big Trees on the way. The Lodi to Wallace section was completed in 1882, ending in Valley Springs in 1885. The branch carried mine and agricultural products to Lodi, where they could be transshipped to the SPRR, and the SPRR soon bought the narrow-gauge line and spread it to standard gauge (**Appendix D**). In 1922 deposits of high-grade limestone and shale suitable for the manufacture of cement were discovered near the Kentucky House Inn. The railroad tracks were extended from Valley Springs to Kentucky House, and served the new Calaveras Cement Company (**Appendix D**).

FIELD SURVEY

AES conducted a cultural resources field survey of the Proposed Project site on March 8, 2017 (**Appendix D**). Pedestrian transects spaced 15 meters apart were used to examine the entire project area. More intensive examination occurred on the creek banks. There were no bedrock outcrops to examine for signs of milling or plant processing activities. Throughout the survey area, visibility ranged from poor to very poor as thick seasonal grasses and other vegetation made it difficult to see the ground, with the notable exceptions of cow paths south of the bridge, small areas cleared for the emergency access road construction, and the creek banks in the general vicinity of the bridge (**Appendix D**).

3.5.2 REGULATORY SETTING

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that, for projects financed by, or requiring the discretionary approval of public agencies in California, the effects that a proposed project has on historical or unique archaeological resources be considered (Public Resources Code [PRC] Section 21083.2). Historical resources include: buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201). CEQA Guidelines Section 15064.5 define three cases in which a property may qualify as a historical resource for the purpose of CEQA review:

- If it is listed in, or determined to be eligible by the State Historical Resources Commission for listing in the CRHR; or

- It is included in a local register of historical resource or identified as significant in a qualifying historical resource survey; or
- The resource appears in, or is determined eligible for the listing, in the CRHR. Public Resources Code Section 5024.1 and CEQA Guidelines 15064.5 define eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:
 - 1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
 - 2) is associated with the lives of persons important in our past;
 - 3) embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
 - 4) has yielded, or may be likely to yield, information important in prehistory or history.

Sites younger than 45 years, unless of exceptional importance, are not eligible for listing in the CRHR. Properties must retain integrity to be eligible for listing on the CRHR. Properties that are listed in, or are eligible for, listing in the National Register of Historic Places are automatically considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC section 5024.1(d)(1)).

1. The resource is included in a local register of historic resources, as defined in section 5020.1(k) of the PRC, or is identified as significant in a historical resources survey that meets the requirements of section 5024.1(g) of the PRC (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
2. The lead agency determines that the resource may be a historical resource as defined in PRC section 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record.

Public Resources Code Section 21083.2 governs the treatment of unique archaeological resources, defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated" as meeting any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

3.5.3 IMPACT DISCUSSION

QUESTION A

No historical resources, as defined in CEQA Guidelines 15064.5, were identified within the Proposed Project site except for the Kentucky House Branch of the SPRR berm (CA-CAL-1757/ CA-CAL-1451H/ CA-SJO-250H), crossing the Proposed Project site north of the bridge. All ties and rails have long since been removed, and the berm itself is overgrown. That portion in San Joaquin County has been evaluated as Category 6Y (found ineligible for NRHP by consensus through Section 106 process) and it is presumed that the portion located within Calaveras County is the same. The existing Bollea Road bridge was constructed as a temporary replacement in 1998, is less than 50 years old, and is not a historical resource. Therefore, construction of the Proposed Project will have **no impact** on historical resources.

QUESTION B

No archaeological resources, as defined in CEQA Guidelines 15064.5, were identified within the Proposed Project site. The physical layout of the immediate vicinity of the bridge indicates an overall scour pattern; immediately downstream the creek bends northwards so that water shooting past the bridge abutments (after scouring the bridge abutment area) would strike the northern bank, causing erosion there; this pattern would seem to be confirmed by the presence of riprap and concrete slabs that appear to have been placed along that portion of the bank to inhibit erosion. Therefore, it is concluded that it is more likely that a general pattern of storm-water scour prevailed within the Proposed Project site in the past. As a result, the potential for buried archaeological deposits, particularly along the north bank of Bear Creek, is considered to be low, however there is always the potential that resources will be uncovered during project construction. With implementation of **Mitigation Measure CR-1**, impacts to archaeological resources discovered during construction of the Proposed Project would be reduced to **less than significant with mitigation**.

QUESTION C

It is unlikely that human remains are located within the Proposed Project site due to the general pattern of storm-water scour in the immediate vicinity of the existing bridge. However, if any human remains are encountered during ground-disturbing activities, impacts to these remains would be potentially significant. With implementation of **Mitigation Measure CR-2**, impacts to human remains discovered during construction would be reduced to **less than significant with mitigation**.

MITIGATION MEASURES

CR-1 Should unusual amounts of bone, stone, shell, features including foundations, wells, historic trash pits, or other features be uncovered during project construction, all work within 60 feet of the find shall halt immediately, and the Caltrans District 10 Local Assistance Archaeologist, and the Local Assistance Engineer shall be notified. Caltrans and County officials shall formulate appropriate measures for the evaluation and treatment of the find; these measures shall be implemented by the County prior to the resumption of construction. Potential treatment methods for significant and potentially

significant resources may include, but would not be limited to, avoidance of the resource through changes in construction methods or project design or implementation of a program of testing and data recovery, in accordance with all applicable federal and state requirements. Any efforts shall be documented in a cultural resource report to be filed with the CCIC.

- CR-2** Stop work within 60 feet if human remains are uncovered during construction, assess the significance of the find, and pursue appropriate management. California law recognizes the need to protect interred human remains, particularly Native American burials and items of cultural patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code §7050.5 and §7052 and California PRC §5097. If remains are uncovered, the Caltrans District 10 Local Assistance Archaeologist, the Local Assistance Engineer, and the County coroner shall be notified immediately. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The project applicant or its appointed representative and the professional archaeologist shall contact the Most Likely Descendent (MLD), as determined by the NAHC, regarding the remains. The MLD, in cooperation with the City shall determine the ultimate disposition of the remains and any associated artifacts.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.6 ENERGY				
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.6.1 ENVIRONMENTAL SETTING

The Proposed Project site is located in unincorporated San Joaquin and Calaveras Counties and is surrounded by agricultural and grazing land, open space and rural residential properties. High-voltage electrical lines are located to the south/east of the Proposed Project site; however, no electricity is supplied for usage to the Proposed Project site. As a roadway and bridge used for local residents and surrounded by open, largely uncultivated and unimproved land, the only the Proposed Project site's associated operational emissions include transportation emissions from vehicle use on Bollea Road and occasional roadway, bridge and utility infrastructure maintenance equipment.

3.6.2 REGULATORY SETTING

California Green Building Code Part 11 of the California Code of Regulations (CCR), also known as CalGreen, is a set of mandatory and voluntary requirements for residential and non-residential structures. Requirements of the CalGreen code focus on promoting the use of efficient materials, reducing the energy demand of new and substantially modified structures, and reducing construction waste. CalGreen is updated on a triennial basis. The 2019 CalGreen code became effective January 1, 2020. The current 2019 CalGreen code requires that all new residential construction meet zero net energy requirements, at least 15 percent of residential parking must include spaces provided for electric vehicle charging, buildings must have a minimum amount of onsite renewable energy generation, and buildings must achieve a given energy budget. Additionally construction activity must divert at least 65 percent of the construction waste generated during new construction, additions, alterations, and demolition through reuse or recycling.

The Calaveras and San Joaquin County General Plans also contain goals and policies to encourage energy efficiency and renewable energy. In the County of San Joaquin General Plan, these are included in the Community Development, Public Facilities and Services, and Natural

and Cultural Resources Elements, and include policies that support the use of solar panels, sustainable technologies, LEED-compliant buildings, energy retrofits and energy conservation (SJC, 2016a). In the Calaveras County General Plan, these are included in the Housing and Public Facilities Elements, and include policies that support CalGreen compliance and voluntary standards; weatherization programs; amendment of zoning codes to encourage alternative energy infrastructure; encouraging alternative energy incentives; and collaboration with Pacific Gas and Electric (PG&E) utility to improve energy efficiency, perform energy audits and provide funding for efficiency (CC, 2019a).

3.6.2 IMPACT DISCUSSION

QUESTIONS A AND B

The Proposed Project would replace the existing structurally deficient Bollea Road rail car bridge with a concrete slab bridge that meets AASHTO standards. Upon completed construction of the new bridge, the Proposed Project would remove the emergency bypass bridge located approximately 15 feet to the east of the existing bridge. The Proposed Project would require diesel and/or gasoline fuel for powering construction equipment. No electrical power or stationary fuel sources would be built on-site. The adjacent site usage would remain as agricultural and grazing land, open space and rural residential properties. Operational energy use of the Proposed Project is not expected to differ from that of the existing site use, as the Proposed Project would involve the same site use as prior to construction of the emergency bypass route as a transportation thoroughfare. Additionally, with bridge structural improvements, maintenance needs on the Proposed Project site would not increase. Because no building structures would be built on site, the Proposed Project would not be required to comply with CalGreen energy efficiency building requirements, nor would it conflict with San Joaquin or Calaveras County General Plan requirements. By improving roadway access and returning traffic to Bollea Road upon bridge completion, the Proposed Project would likely reduce operational energy intensity from on-road transportation. The Proposed Project would also comply with CalGreen's standard for construction waste diversion from landfills. Energy demands of the Proposed Project would therefore result in **less than significant** impacts to energy resources and would adhere to all state and local plans for renewable energy and energy efficiency.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.7 GEOLOGY AND SOILS				
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.7.1 ENVIRONMENTAL SETTING

The project is located on the boundary line between Calaveras and San Joaquin Counties. Calaveras County is located in the central-western portion of the Sierra Nevada geomorphic province, and its topography and geology are heavily influenced by the Sierra Mountain range. The western edge of Calaveras County and the eastern edge of San Joaquin County are characterized by rolling hills approaching the foothills of the Sierra Nevada range to the east. The Proposed Project site is situated at an approximate elevation of 200 feet above mean sea level.

The Proposed Project site is located within San Joaquin Valley, which occupies the southern two-thirds of the 700-mile long Central Valley of California. The valley is comprised of an asymmetric structural trough filled with a prism of Upper Mesozoic and Cenozoic sediments. Generally, the valley floor is composed of active alluvial fans along the mountain ranges, alkali basins, and river floodplains consisting of well-sorted flood deposited soils. Geologically, the San Joaquin Valley has undergone periods of uplift and subsidence over millions of years. The valley was filled with an interior ocean during the Jurassic and Cretaceous periods, up until the late Pliocene (circa [ca.] 5 million years ago). As a result, the valley partially filled with sediment while inundated, then continued to fill with alluvial fan soils washed down from the Sierra Nevada and the Coast Ranges during the Pleistocene and Holocene eras (**Appendix D**).

The Proposed Project site is located in Township 4 North, Range 9 East, Section 16, as depicted on the U.S. Geological Survey (USGS) "Wallace, CA" 7.5-minute topographic quadrangle. As noted in **Section 2.1.1 Existing Setting**, the site includes the Bollea Road Bridge (No. 29C-413) over Bear Creek in eastern San Joaquin County, west of the community of Wallace; the Proposed Project site extends far enough eastward to enter Calaveras County and encompasses a total of 4.4 acres. The study area is rural; surrounding land uses include rural residential uses, agriculture, grazing and undeveloped open space.

The Bear Creek drainage has, in part, scoured soils away and caused bank instability on either side of the bridge. Braided overflow channels, particularly northwest of the bridge, indicate the tendency for scour rather than deposition; the sandy deposits found just downstream of the bridge can be attributed to slowing waters after channel contraction caused by bridge abutments and are unlikely to represent prehistoric depositional patterns (**Appendix D**).

The existing bridge site underlain by Tertiary age Mehrten Formation. This unit is described as "andesitic conglomerate, sandstone, and breccias." Quaternary age Modesto-Riverbank Formations are shown bordering the site on the north (100±ft) and are described as "arkosic alluvium." Tertiary Valley Springs Formation, composed of rhyolitic tuff and sedimentary rocks is shown approximately 1,500 ft to the east of the Proposed Project site (**Appendix D**).

SEISMICITY

The Proposed Project site is located in an area of California with the lowest potential for catastrophic earthquakes compared to the western portions of the state. There is one fault system approximately 10 miles east of the project site, the Foothills Fault System of the Sierra Nevada's. This fault is considered potentially active, having known associated movement within

the past 1.6 million years; however, not within the last 10,000 years. Accordingly, the Proposed Project site is located in an area identified to have the lowest risk of damage from earthquakes in California (DOC, 2016).

SOIL AND SOIL HAZARDS

Soil survey reports for the project site are available online through the USDA Natural Resources Conservation Service. Each NRCS survey maps soil units and provides a summary of major physical characteristics with recommendations based on the soil characteristics. As shown in **Figure 3.7-1** below, mapped soil types within the Proposed Project site consist of Acampo sandy loam with 0 to 2 percent slopes along the southern portion of the site below the existing bridge; Pentz sandy loam with 2 to 15 percent slopes in a small portion of the southeastern corner; Mined Land-Anthraltic Xerorthentz complex with 1 to 15 percent slopes in the northern portion; and Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex with 0 to 8 percent slopes along the central portion (USDA, 2018). Acampo sandy loam is moderately well drained and comprised of alluvium derived from granite; Pentz sandy loam is derived from residuum weathered from basic andesitic tuffaceous sandstone (USDA, 2018). Acampo sandy loam is found on fan terraces and consists of alluvium derived from granite. The typical profile is an A horizon from 0 to 19 inches, and B horizon below that. As an A horizon, the time of deposition can range widely (USDA, 2017).

The initial soils report for the Proposed Project site indicates that Acampo sandy loam has a moderate rutting hazard rating and are very limited in their potential use in structural features such as embankments, dikes, and levees (NRCS, 2017). Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation and the Revised Universal Soil Loss Equation to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (KSAT). Erosion factor KW (whole soil) indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments, which are typical of the soils in the Proposed Project site and vicinity. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Acampo sandy loam has an overall mid-range K of .20. Overall, the factors analyzed in the USDA soils report indicates at least moderate susceptibility to erosion in the soils in the immediate vicinity of the bridge (NRCS, 2017).

The physical layout of the immediate vicinity of the bridge would also indicate an overall scour pattern; immediately downstream the creek bends northwards so that water shooting past the bridge abutments (after scouring the bridge abutment area) would strike the northern bank, causing erosion there; this pattern would seem to be confirmed by the presence of riprap and concrete slabs that appear to have been placed along that portion of the bank to inhibit erosion (**Appendix D**). Therefore, it is concluded that it is more likely that a general pattern of storm-water scour prevailed within the Proposed Project site in the past (NRCS, 2017).

FIGURE 3.7-1: Soil Types

Notes: Values correspond to the following soil types: 101—Acampo sandy loam; 206—Pentz sandy loam, 2-15% slope; 207—Pentz sandy loam, 15 to 50% slope; 8111—Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex; and 1013—Mined Land-Anthraltic Xerorthents complex. Areas labeled 207 do not lay within the Proposed Project site.

Source: USDA 2018.

3.7.2 REGULATORY SETTING

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972; it prohibits the placement of structures intended for human occupancy from being built across active fault traces in California. The Act requires delineation of zones (Alquist-Priolo zones) along active faults in order to address seismic concerns as they relate to public safety and project design. The Act only addresses the hazards of surface fault rupture and is not intended to regulate activities relating to other earthquake hazards such as liquefaction, landslides, or tsunamis. Cities and counties are required to regulate development projects within Alquist-Priolo zones.

SEISMIC HAZARDS MAPPING ACT

This Seismic Hazards Mapping Act provides cities, counties, and state agencies, which are prone to earthquake hazards of liquefaction, earthquake-induced landslides and amplified ground shaking, appropriate seismic hazard zone maps to be used during the planning and controlling of construction and development. Before a development permit can be granted to a proposed project located in a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design in hopes to minimize the loss of life and property. Because the Proposed Project does not include any structures, nor would in construct structures for the purpose of human habitation, the Seismic Hazards Mapping Act would not pertain to the Proposed Project.

3.7.3 IMPACT DISCUSSION

QUESTION A

The Proposed Project would not be developed in an areas showing recent seismic activity and is thereby located in an area with low potential for seismic shaking hazards. Therefore, no adverse impacts from fault rupture or seismic shaking would result from project development (DOC, 2016). Due to the relatively flat topography and soil structure, there would not be a risk for landslides based on the activities of the Proposed Project. The Proposed Project would not expose people or structures to potentially substantial adverse effects including the risk of loss, injury, or death. **Less Than Significant.**

QUESTION B

During the construction of the Proposed Project, underlying soils at the project site would be temporarily exposed during grading and underground activities, which could lead to an increase in erosion. Exposed soils are more likely to erode during rainfall or high winds because stabilizing vegetation has been removed. The State Water Resources Control Board requires the project applicant to obtain a National Pollutant Discharge Elimination System (NPDES) permit for construction activities. The NPDES permit is required for all projects that include construction activities, such as clearing, grading, and/or exaction that disturb at least one acre of land area. The NPDES permit requires that the Proposed Proponent prepare and submit to the City of approval a Project Specific Storm Water Prevention Plan (SWPPP) to control soil erosion during construction because the site is larger than one acre. The SWPPP would identify a combination of erosion control and sediment control measures (BMPs) to reduce or

eliminate sediment discharge to surface water during construction. With compliance to the requirements noted in the SWPPP, the potential for erosion impacts during construction would be less than significant. After completed, the bridge would not increase the potential for erosion compared to existing conditions. **Less Than Significant.**

QUESTION C

The Proposed Project is not located on a geological soil that is unstable or would become unstable as a result of the Proposed Project activities. There is no evidence of on-site landslides, lateral spreading, subsidence, liquefaction, or collapse on or near the project site. The site is relatively flat and not susceptible to landslides, lateral spreading, subsidence, liquefaction, or collapse. **No Impact.**

QUESTION D

The project site is not located on expansive soils as defined in Table 18-1-B of the Uniform Building Code. Impacts as a result of expansive soils during construction will be less-than-significant. **Less Than Significant.**

QUESTION E

No septic tanks or sewer lines are proposed to be used and therefore the Proposed Project site would not have an impact on the use of septic tanks or alternative wastewater disposal systems. **No Impact.**

QUESTION F

The Proposed Project is not located on a unique paleontological resource or site nor a unique geologic feature, and thus no unique paleontological resource or site nor a unique geologic feature would be directly or indirectly destroyed as a result of the Proposed Project (refer to **Section 3.5.3**). **No Impact.**

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.8 GREENHOUSE GAS EMISSIONS				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.8.1 ENVIRONMENTAL SETTING

Climate change is the change in average weather that can be measured by wind patterns, storms, precipitation, and temperature. Greenhouses gases (GHGs) are molecules that due to their chemical bonding structure have capacity to absorb and radiate heat, trapping heat in the atmosphere. GHGs are emitted into the atmosphere from both natural sources and human activities. Some of the most common GHGs include water (H₂O), carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

The heat-trapping or “global warming” potential (GWP) of a gas is compared to CO₂ as a baseline—which has a heat trapping potential of one—and is reported in terms of CO₂-equivalent (CO₂e), usually over a 100-year time frame. The GWP of a GHG decreases over time, however, and the length of time a GHG remains in the atmosphere can vary substantially. Lifetimes of GHGs can range from a decade to 50,000 years (US EPA, 2018). Aerosols and refrigerants are also GHGs, and although emitted in much smaller quantities, have far higher heat-trapping capacity than CO₂: 1,000 to 10,000 times greater or more (US EPA, 2018).

Global atmospheric concentrations of GHGs have risen consistently since the start of the Industrial Revolution in approximately 1750, due largely to combustion of fossil fuels, forest and land clearing, use of products such as aerosols and refrigerants, and raising of livestock. Carbon dioxide in the atmosphere was measured to be approximately 270 parts per million (ppm) in approximately 1750; today, the global concentration of CO₂ has been increasing at a rate of 2 to 3 ppm per year, with an average global concentration of 412 ppm in December 2019 (NOAA, 2020). The California Governor’s Office of Planning and Research (OPR) provide guidance on integrating analysis of climate change in California Environmental Quality Act (CEQA) documents (OPR, 2008).

Increased atmospheric GHG concentrations have caused a steady increase in global temperature (US EPA, 2018). From 1901 to 2016, the average land and ocean surface temperature has increased by approximately 1.8°F (USGCRP, 2017). The most recent

Intergovernmental Panel on Climate Change (IPCC) report indicates that global temperature is likely to increase between 0.5°F and 8.6°F by 2100 compared to the average between 1986 and 2005 (IPCC, 2013). This is likely to cause changes in rainfall patterns, snow and ice cover and sea level rise (US EPA, 2018). These, in turn, could affect California's flora and fauna, water supply, and climate, including those in the County of San Joaquin and Calaveras County.

The IPCC projects a number of future GHG emissions scenarios leading to varying severities of impacts on the environment and the global economy. According to the most recent IPCC report, the *Fifth Assessment Report* (AR5), released in full in 2014, if anthropogenic GHG emissions continue to increase, a "tipping point" will be reached at which the above impacts would become irreversible (IPCC, 2014). AR5 notes that it will be difficult to impossible for the climate system to revert to a previous state once it has reached this tipping point; the change is termed "irreversible" over a given timescale and forcing range (IPCC, 2014).

The Proposed Project site is located on the northwestern border of the County of San Joaquin and the northeastern border of Calaveras County. As noted in **Section 2.1.1 Existing Setting**, the Proposed Project site is located on unincorporated land surrounded by agricultural, grazing, open space and rural residential land. The California Department of Public Health (CDPH) developed a *Climate Change and Health Profile Report Calaveras County* in February 2017. The Profile Report indicates that Calaveras County may experience an increase in temperature between 3.8°F and 6.5°F by 2099 (CDPH, 2017). Health impacts due to heat include increased risk of heat stress; respiratory disease due to increased smog-related chemical reactions and pollen; foodborne and waterborne illness; food insecurity and increased food prices; exposure to mold; poor indoor air quality; flooding; drought; and water supply shortages. These could also impact associated social services, including healthcare, emergency response and water treatment services; infrastructure capacity; and energy production (CDPH, 2017).

While Calaveras County has not adopted a Climate Action Plan (CAP), the 2018 Draft Environmental Impact Report (EIR) to the County's Draft General Plan notes that Calaveras County is at risk of many of the potential statewide impacts of climate change, including changes to precipitation patterns and growing seasons, wildfires, ecosystem alternations, increased air pollution and temperatures (CC, 2018).

3.8.2 REGULATORY SETTING

The State of California has passed many regulations intended to reduce GHG emissions from the transportation sector, commercial and industrial facilities, and society-wide. Governors have also signed Executive Orders (EOs), with which state entities must comply, but which remain goals and recommendations for external entities until and unless they are signed into law. Some of the most prominent GHG-related legislation is described below.

EO S-3-05 was established in June 2005 by Governor Schwarzenegger. It established three GHG emission reduction targets: reduce to 2000 GHG emission levels by 2010; reduce to 1990 emission levels by 2020; and reduce 80 percent below 1990 emission levels by 2050. It also required that the Secretary of the California Environmental Protection Agency (EPA) submit biannual reports to the governor and state legislature describing progress toward achieving

these goals, impacts of climate change in the state, and mitigation and adaptation plans to address these impacts.

Assembly Bill (AB) 32, the California Climate Solutions Act of 2006, was passed in September 2006. The bill codified the first GHG target of EO S-3-05. AB 32 established the first comprehensive GHG regulatory program in the U.S. and required GHG emissions to be reduced to 1990 levels by 2020. This bill provided CARB authority to enforce a statewide GHG cap by identifying the statewide emissions level and implementing a Scoping Plan to identify all strategies necessary to fully achieve the required 2020 emissions reductions across sectors.

In the State Scoping Plan, CARB laid out the GHG reductions that would need to be achieved and the types of measures that would be used to reach them. The Plan predicted that under a “business as usual” (BAU) scenario, GHG emissions in 2020 would equal 596 million metric tons (MMT) CO₂e. Consequently, compared to the State’s 1990 GHG emissions inventory, emissions would need to be reduced by 169 MMT CO₂e in 2020. This represents a 30 percent GHG reduction from the 1990 level. The Scoping Plan provides the following key recommendations to reduce GHG emissions:

- Expand and strengthen existing energy efficiency programs as well as building and appliance standards;
- Achieve a statewide renewable energy mix of 33 percent;
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopt and implement measures pursuant to existing State laws and policies, including California’s clean car standards, goods movement measures, and the Low Carbon Fuel Standard.

The State Scoping Plan was initially approved in December 2008 and updated in 2014 and 2017. In each update, the Scoping Plan outlined progress California had made to date regarding near-term 2020 GHG limits, such as cleaner and more efficient energy, cleaner transportation, and CARB’s Cap-and-Trade Program. The 2017 State Scoping Plan also incorporated guidance for achieving the State’s 2030 GHG reduction goals, described further below (CARB, 2017).

In August 2007, Senate Bill (SB) 97 was adopted to recognize the need to address climate change under CEQA. The OPR was directed to prepare guidelines for mitigation of GHG emissions, including guidelines for public agencies in analyzing and mitigating GHG emissions. Particularly, it recognized the need to address cumulative contribution of emissions for a development project. It also required that lead agencies make a good-faith effort to calculate and describe GHG emissions potentially resulting from a project. SB 97 allowed on-site and off-site mitigation, including project design features to reduce emissions, as well as sequestration.

Senate Bill 375, the Sustainable Communities and Climate Protection Act, was adopted in September 2008. Building on AB 32, SB 375 directed CARB to develop regional GHG emission

reduction targets to be achieved by MPOs. MPOs became required to align their regional transportation, housing and land use plans and prepare Sustainable Communities Strategies (SCS) to reduce vehicular travel and GHG emissions. Through SB 375, the State encouraged alternative transportation planning in regional plans. CARB determines whether the SCS will achieve the region's GHG emissions reduction goals. Under SB 375, certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined CEQA review. The San Joaquin Council of Governments (SJCOG) is the Metropolitan Planning Organization (MPO) for the County of San Joaquin. SJCOG developed its associated RTP/SCS in 2018. Calaveras County is not included in an MPO and therefore is not required to have an SCS (CC, 2018).

In accordance with SB 97, the Natural Resources Agency adopted Amendments to the *CEQA Guidelines* for GHGs on December 30, 2009. The Amendments became effective in March 2010, and provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency;
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project;
- Significance may rely on qualitative analysis or performance based standards;
- The CEQA document shall discuss regional and/or local GHG reduction plans;
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable;
- A description of the effects of climate change on the environment shall be included in CEQA documents;
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions;
- GHG analysis in a CEQA document may be Tiered or Streamlined; and

Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

EO B-30-15 was signed by the Governor on April 29, 2015, and established a state GHG reduction target of 40 percent below 1990 levels by 2030. This intermediate GHG emissions reduction target would make it possible to meet the ultimate GHG emissions reduction target of 80 percent below 1990 levels by 2050 as established in EO S-3-05.

In September 2016, AB 197 and SB 32 were passed to further build on GHG reduction targets. SB 32 set new goals to reduce GHG emissions 40 percent below 1990 levels by 2030, supporting EO S-03-05's goal of 80 percent emissions reduction by 2050. To increase transparency of the required emissions reductions, AB 197 established a Joint Legislative Committee on Climate Change Policy to provide oversight and accountability of CARB. It also

focused on the need to consider social costs of emissions reduction regulations to further consider the impact on disadvantaged communities.

Several additional pieces of legislation have been passed by the State to reduce transportation-related and building-related emissions. These include AB 1493, also known as Pavley I, adopted in 2002 to reduce emissions of passenger vehicles and light-duty trucks; the Renewable Portfolio Standard (RPS) adopted in 2002 under SB 1078, to increase renewable energy procurement among investor-owned utilities (IOUs); SB 107 of 2006 and SB 2 of 2011 to accelerate the RPS to reach 33 percent procurement of renewable energy by 2020; EO S-01-07, which in 2007 established a Low Carbon Fuel Standard (LCFS) for transportation fuels and required a reduction of the carbon intensity of fuels of ten percent by 2020; the State Cap-and-Trade Program, envisioned in the 2008 State Scoping Plan for facilities and industries to trade permits to emit GHGs; and AB 398, which in 2017 authorized the continuation of the Cap-and-Trade program through 2030.

Lastly, in September 2018, Governor Brown signed SB 100 and EO B-55-18. SB 100 required that IOUs procure 50 percent renewable energy by 2026; 60 percent renewable energy by 2030; and 100 percent carbon-free energy by 2045, further accelerating the RPS. EO B-55-18 required that the state reach economy-wide carbon neutrality by 2045. Methods are left ambiguous in the bill, allowing for flexible options including nonrenewable, carbon-free energy sources such as nuclear and natural gas with carbon capture and storage.

As noted in **Section 3.3 Air Quality**, Calaveras County is located within the jurisdiction of the CCAPCD, a Special District governed by the Calaveras County Air Pollution Control Board. The CCAPCD does not have an adopted threshold of significance for construction-related greenhouse gas emissions, though it recommends consistency with Appendix G of the CEQA Guidelines. Further, the County has not yet adopted a Climate Action Plan (CAP) and is not required to develop an SCS.

SJCOG is the MPO for the County of San Joaquin. As noted above, in 2018, SJCOG prepared an RTP/SCS (SJCOG, 2018). To incorporate strategies set forth in this, it also performed a Climate Adaptation and Resiliency Study. In 2019, it published a Transportation Resiliency Briefing, setting forth plans and objectives to increase resiliency and adaptation actions. Recommendations based on this assessment are expected to be included in a Climate Adaptation Report and Climate Summit in 2020 (SJCOG 2019). Strategies noted in the briefing include reducing transportation-related emissions, but it does not set quantitative thresholds for GHG emissions.

The San Joaquin Valley Air Pollution Control District (SJVAPCD) provides guidance for GHG emissions reduction measures of development projects, adopted in 2019 based on goals of its 2008 Climate Change Action Plan (SJVAPCD, 2012). The guidance focuses on use of Best Performance Standards (BPS) to assess cumulative significance of a project's impact on GHG emissions and contribution to global climate change and is intended to align emissions reductions with the State Scoping Plan (CARB, 2017). The SJVAPCD GHG requirement does not provide a set emissions threshold; instead, it requires compliance with the BPS or

demonstrated reduction in GHG emissions of 29 percent compared to business as usual (BAU) (SJVAPCD, 2012).

3.8.3 IMPACT DISCUSSION

QUESTION A

The Proposed Project is composed of replacing the existing Bollea Road rail car bridge with a new concrete slab bridge meeting AASHTO standards, as well as removal of the emergency bypass crossing Bear Creek that was put in place after a December 2017 storm caused the Bollea Road bridge to become impassible by vehicle. The Proposed Project would involve realignment of the bridge with Bollea Road, requiring acquisition of ROW. Surrounding land uses would not be altered, nor would the use of Bollea Road as a transportation corridor serving rural residences. Further, the proposed bridge is not intended to increase roadway capacity or expected to require increased capacity beyond the expected business as usual growth of the local area. As noted in **Section 2.1.1 Existing Conditions**, the road has an ADT of approximately 26 vehicles per day and a projected ADT of 42 vehicles per day in 2032 (Caltrans, 2020c). The Proposed Project would also not alter location or distribution of traffic along Bollea Road, create new housing, commercial or other land uses that would generate new vehicle trips and associated GHG emissions.

Project construction and demolition of the existing bridge and bypass bridge would generate GHG emissions due to equipment operation and materials transport. Emissions would occur from vehicle and equipment exhaust due to the combustion of fuel and natural gas. These emissions would be limited in duration and would cease after construction. Emissions associated with operation of the Proposed Project include those from combustion of fuels used in periodic roadway maintenance. As the replacement bridge is intended to be more structurally sound, safe for driving, and permanent than the current Bollea Road Bridge and emergency bypass bridge, the Proposed Project may provide a decreased need for maintenance and decreased associated GHG emissions. Given the small scale of the Proposed Project, a **less than significant impact** of GHG emissions would be produced during construction and operation.

QUESTION B

As noted above, although Calaveras County is expected to experience impacts of climate change, it has not yet adopted a CAP, nor is it required to implement an SCS. The CCAPDC also does not have an adopted threshold of significance for construction-related greenhouse gas emissions. SJCOG is expected to release a Climate Adaptation Report in 2020 providing recommended actions to address climate change adaptation and mitigation; its RTP/SCS and Climate Adaptation and Resiliency Study suggest reducing transportation-related emissions but do not provide emissions thresholds. Similarly, the SJVAPCD GHG requirement does not provide a set threshold to assess cumulative significance of emissions; instead, it requires compliance with BPS or demonstrated reduction in GHG emissions of 29 percent compared to business as usual (SJVAPCD, 2012).

The Proposed Project is not intended to increase roadway capacity or expected to require increased capacity beyond the expected business as usual growth of the local area. The Proposed Project would also not alter location or distribution of traffic along Bollea Road, create new housing, commercial or other land uses that would generate new vehicle trips and associated GHG emissions. Further, the project is classified as an Exempt Safety Project under 40 CFR 93.126, as “widening narrow pavements or reconstruction bridges (no additional travel lanes)”. Per the CFR, such projects can “proceed toward implementation even in the absence of a conforming transportation plan”. Therefore, the Proposed Project is exempt from need for a transportation plan. The Proposed Project would not result in a cumulatively considerable net increase of GHGs and would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts associated with applicable plans, policies, or regulations of GHG emissions would be **less than significant**.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.9 HAZARDS AND HAZARDOUS MATERIALS				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.9.1 ENVIRONMENTAL SETTING

EXISTING CONDITIONS

Two database searches (Department of Toxic Substances Control (DTSC) Envirostor and the RWQCB Geotracker) were performed within 1000 ft of the project location to confirm that the Project area was not on or adjacent to a hazardous material site.

The Online Geotracker database was queried for LUST Cleanup Sites, Cleanup Program Sites, Military Clean-Up Sites, and DTSC Cleanup Sites (SWRCB, 2020). The aforementioned cleanup sites do not occur within 1000 feet of the project area. According to the online GeoTracker database, there are two closed leaking underground storage tank (LUST) cases located approximately 1,200 feet northeast of the project site, in addition active underground storage tank which is located adjacent to a gas distribution facility. The three underground storage tanks are listed in the table below. Due to its closure status, Wallace Stage Stop LUST site would not impact the project. Project activities including construction, pile driving, excavation, construction, and stream channel work do not occur in the direct vicinity of any cleanup sites will not disturb the underground storage tanks in the area.

Table 3.9-1: Underground Storage Tanks in neighborhood located approximately 1200 feet from the Proposed Project Location.

Site Name and Location	County	Type	Status	Cleanup Oversight Agencies
Wallace Stage Stop (Underground Storage Tank) - 8090 Hwy 12 E, Wallace, CA 95254	Calaveras County	LUST Clean-Up Site	Case Closed as of 12/23/1996	Central Valley RWQCB
Wallace Stage Stop #2 (Underground Storage Tank) - 8048 Hwy 12, Wallace, CA 95254	Calaveras County	LUST Clean-Up Site	Open - Site Assessment as of 2/6/2017	Central Valley RWQCB
Sierra Super Stop #38 (Underground Storage Tank) - 8048 Hwy 12, Wallace CA 95254	Calaveras County	Permitted UST	Active	Central Valley RWQCB

No Underground Storage Tanks, LUST Cleanup Sites, Cleanup Program Sites, Military Clean-Up Sites, and DTSC Cleanup Sites were identified within 1000 feet of the Project Site (SWRCB, 2020). Additionally, the Department of Toxic Substances Control (DTSC's) Envirostor database was queried to identify any cleanup sites in the area. No Federal Superfund, State Response, Voluntary Cleanup, School Cleanup, Evaluation, School Investigation, Military Evaluation, or other DTSC clean-up site was located. (DTSC, 2020).

2.4.1 LOCAL ENVIRONMENTAL AGENCY

The California State Water Resources Control Board (SWRCB) and Department of Toxic Substances Control (DTSC) databases provided search and documentation of local hazardous materials data. Additionally, an Environmental Database Research, Inc. (EDR) report was generated for this project location.

AIRPORT HAZARD ZONES

Airports and air strips are considered to contain harmful material and are considered a potential hazardous zone. The nearest airport is Howard Private Airport, which is located north of the Camanche Reservoir. The Proposed Project is located approximately 14 miles away from Howard Private Airport by road, and is not located near any public airport.

WILDLANDS

The project site is within a rural area surrounded by agricultural use and by scattered commercial and residential land use. The project site is not located in a Tier-2 Elevated Fire Threat Zone (CPUC, 2020). According to CalFire, the project site is located in a Local Responsibility area with a Moderate risk of fire, which is in a non-Very High Fire Hazard Severity Zone (non-VHFHSZ) (CalFIRE, 2007; CalFIRE, 2009).

3.9.2 REGULATORY SETTING

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, State, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as:

“A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed” (CCR, Title 22, Section 66260.10).

CORTESE LIST

California Government Code Section 65962.5(a) states that the DTSC shall compile and update as appropriate, but at least annually, a list detailing the following (commonly known as the Cortese List):

1. All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code
2. All land designated as hazardous waste property or border zone property pursuant to Article 11 (commencing with Section 25220) of Chapter 6.5 of Division 20 of the Health and Safety Code.
3. All information received by the Department of Toxic Substances Control pursuant to Section 25242 of the Health and Safety Code on hazardous waste disposals on public land.
4. All sites listed pursuant to Section 25356 of the Health and Safety Code.

DATABASE SEARCHES

EnviroStor is a DTSC data management system for tracking hazardous material incidents in California. The database includes information on contaminated sites and lists facilities that process or transfer toxic waste, including sites found on the Cortese List. The database includes federally designated sites, state response sites, military sites, school sites and voluntary cleanup sites. Each entry in the database contains a report that includes information on the current address, site status, past contaminating uses, history of the site, current and historical toxic substances present, land use restrictions, potential environmental impacts of

present toxic substances, and completed or planned projects. Sites that were once listed as contaminated, but have been cleaned up or been completed, are also specially listed.

A search of the Proposed Project area revealed that there are no sites listed on the EnviroStor database within 1,000 feet of the project site and the project site is not listed on the EnviroStor database (DTSC, 2020).

The State Water Resources Control Board (SWRCB) provides an online database system (GeoTracker) that provides information on hazardous materials incidents in California. The GeoTracker data management system indicates no sites on or within 1,000 feet of the project site (SWRCB, 2020).

Additionally, a search of available environmental records was conducted by Environmental Data Resources, Inc (EDR), in order to assist in meeting the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312; EDR, 2019).

3.9.3 IMPACT DISCUSSION

QUESTION A AND B

The Proposed Project would not create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials as there are no known hazards or hazardous materials onsite or within 1,000 feet of the project site. The proposed project will include replacing a bridge with a similar structure. Small amounts of hazardous materials would be transported and used during construction activities (i.e. fuel, solvents, equipment maintenance, roadway resurfacing, and re-striping materials. Hazardous materials would only be used during construction activities for the proposed project. Use of any hazardous materials would be done so with the required applicable local, state, and federal standards associated with the handling, transport, and storage of hazardous materials. Use of hazardous materials in accordance with applicable standards would ensure exposure of the public to hazardous materials would have a less-than-significant impact. **Less-Than-Significant Impact.**

Construction and demolition activities for the Proposed Project would be subject to all local, state, and federal regulations related to the use, storage, and transportation of any hazardous materials such as paint, solvents, and petroleum products. Therefore, the Proposed Project would not cause a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. **Less than Significant.**

QUESTION C

There are no schools located within a quarter mile from the Proposed Project location. Additionally, there are no building plans for a school within a quarter mile of the Project site. Any transport of hazardous material for use on the Project site would follow applicable local, state, and federal guidelines associated with the handling, transport, and storage of hazardous materials. Outside of typical construction materials and fluids, the Proposed Project would not emit hazardous emissions or involve the handling hazardous or acutely hazardous materials,

substances, or waste. Due to the nature of the Proposed Project, the Proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school. **No impact.**

QUESTION D

There are currently no listings of hazardous materials incidents pursuant to Government Code §65962.5 (Cortese List) within 1,000 feet of the project site (SWRCB, 2020; DTSC, 2020). Due to the absence of listings within 1,000 feet of the project site, and the temporary detour in place for public bypassers during the project construction period, there is no indication of hazardous materials that could impact the public. **No Impact.**

QUESTION E

The Proposed Project is not located within two miles of any public airport, and will not result in a safety hazard or excessive noise for people residing or working in the project area. The nearest airport is Howard Private Airport, which is located north of the Camanche Reservoir. The Proposed Project is located approximately 14 miles away from Howard Private Airport by road, and is not located near any public airport. Therefore, there would be no safety hazards associated with airports. **No Impact.**

QUESTION F

The proposed project includes removal of an existing bridge and installation of a new bridge. During the entirety of construction, a traffic detour over a series of corrugated pipes will maintain a one-way road which maintains access to residential properties located south of the bridge. After the old bridge is removed and the new bridge is operational and can support vehicle traffic, the detour can then be retired. The Proposed Project would not result in blockage of access routes or evacuation routes adopted within any emergency response plan or emergency evaluation plan. Once bridge construction is complete, two-way travel on the bridge will commence. Because closure would be temporary and the traffic detour is to be maintained during construction, impacts to emergency response or evacuations are anticipated to be less than significant. **Less Than Significant.**

QUESTION G

The proposed bridge replacement project is surrounded by agricultural land, sparse rural residences, and undeveloped open space. According to the California Fire Hazard Severity Zones in Local Responsibility Areas for San Joaquin County, the project site is located in a Local Responsibility Area with Moderate risk of fire (CAL FIRE, 2007). Equipment and vehicles used during construction activities may create sparks, which could ignite vegetation on the project site. The use of power tools and acetylene torches may also increase the risk of fire during construction. Mitigation listed below would ensure that construction of the Proposed Project would not create a substantial fire hazard. Therefore, the Proposed Project would not be exposed to less than significant risks from wildland fires. **Less Than Significant with Mitigation.**

MITIGATION MEASURES

HAZ-1 Construction equipment shall contain spark arrestors, as provided by the manufacturer.

HAZ -2 Staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.10 HYDROLOGY AND WATER QUALITY				
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) result in a substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) In flood hazard, tsunامي, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.10.1 ENVIRONMENTAL SETTING AND BACKGROUND

The primary objective of the Proposed Project is to replace the existing Bollea Road Bridge over Bear Creek with a structure that is consistent with current standards. The roadway approaching the bridge from the north and south are tangent alignments, which create an angle point which

causes a rise or “hump” in the roadway which creates a sight distance issue for vehicles approaching the bridge. The proposed replacement bridge will raise the profile grade to pass the 100-year storm event requirement per the Caltrans Design Manual, and includes the removal of the existing bridge over Bear Creek, construction of a new bridge to meet current standards, roadway alignments which require the acquisition of additional permanent right-of-way, and limited in-stream construction activities.

Due to the bridge being a clear span structure, the work proposed within the channel will be limited to removal of the remnants of the old south abutment, removal of the north bridge abutments, removal of the detour, and restoration of the south bank upstream of the bridge. Removal of the detour will include restoration of the north and south banks to their pre-project condition (Caltrans, 2018). The restoration of the south bank that sloughed in the storms of 2017 could include benching and compacting earth fill to restore the bank geometry and the installation of revetment to counteract future erosion. Alternatives to rock slope protection will be evaluated during project design.

The project site is located on the boundary line between Calaveras and San Joaquin Counties. Calaveras County is located in the central-western portion of the Sierra Nevada geomorphic province, which has topography and geology influenced by the Sierra Mountain range. The western edge of Calaveras County and the eastern edge of San Joaquin County are characterized by rolling hills approaching the foothills of the Sierra Nevada range. The project site is located within the Lower Bear Creek sub-watershed within the San Joaquin Delta, which drains approximately 24,000 acres, mostly in San Joaquin County. The sub-watershed is bordered with the Camanche Reservoir-Mokelumne River sub-watershed to the north and the Upper Bear Creek Watershed to the east (Caltrans, 2018). Bear Creek flows through the project site from east to west.

In October 2018, a Water Quality Technical Memorandum was conducted and approved by Caltrans for the Bollea Bridge Replacement Project to survey relevant regulatory requirements, describe surface water and ground water resources in the project area, determine the potential impact of project activities, and recommend mitigation measures needed to reduce impacts to water quality to a less-than-significant level (Caltrans, 2018). The Water Quality Technical Memorandum is included in **Appendix E**.

REGULATORY BACKGROUND

A survey of relevant environmental regulations was performed and are discussed in **Appendix E**. Relevant federal, state, regional, and local requirements will be followed including the Clean Water Act, Porter-Cologne Water Quality Control Act, National Pollution Discharge Elimination System Program (NPDES) Construction General Permit (CGP), Section 401 Permitting, the California Endangered Species Act, California Fish and Game Code, and San Joaquin County General Plan.

The Proposed Project would be required to obtain appropriate permits associated with construction in the creek bed. The County shall obtain all necessary permits to construct the Proposed Project and implement all permit terms required by the regulatory agencies. Required

permits include CWA Section 404 Nationwide Permit from USACE, CWA Section 401 Water Quality Certification from RWQCB, Section 1602 Streambed Alteration Agreement from CDFW, and NPDES General Permit from the SWRCB.

EXISTING WATER QUALITY

The San Joaquin River is listed on the Clean Water Act (CWA) Section 303(d) List of Impaired Waters, Category 5. The Category 5 list requires the development of a TMDL for pollutants. The San Joaquin River is impaired for separate constituents within different portions of the River. In the lower portion, the river is impaired from agricultural pesticides and temperature. Other segments of the San Joaquin River are listed for pollutants such as temperature, mercury, boron, pesticides, selenium, arsenic, *Escherichia coli* (*E. coli*), and insecticides (SWRCB, 2018). Bear Creek is a tributary to the northern portion of the San Joaquin River into the San Joaquin Delta and is currently listed for copper, diazinon, *E. coli*, and low dissolved oxygen impairments on the Section 303(d) list (SWRCB, 2018).

Although the San Joaquin River Basin Plan does not explicitly set beneficial uses for Bear Creek, it does set existing beneficial uses of the San Joaquin River, to which Bear Creek is tributary. The noted beneficial uses include: Municipal, Agriculture, Industry, Recreation, Freshwater Habitat, Spawning, and Wildlife Habitat. Mitigation measures used for maintenance of beneficial uses for Bear Creek are described in the Water Quality Technical Memorandum in **Appendix E**.

LOCAL HYDROLOGY

The project site is located within the Lower Bear Creek sub-watershed within the San Joaquin Delta. This sub-watershed drains approximately 24,474 acres, mostly in San Joaquin County. This sub-watershed is bordered with the Camanche Reservoir-Mokelumne River sub-watershed to the north and the Upper Bear Creek sub-watershed to the east (USEPA, 2015). Bear Creek flows through the project site from east to west.

Groundwater levels have steadily declined in the Eastern San Joaquin Subbasin over the past 40 years, at an average rate of 1.7 feet per year and up to 100 feet, cumulatively, in some areas of the subbasin (CDWR, 2006). This decline has been largely attributable to agricultural operations. The San Joaquin Delta is one of California's most productive agricultural areas, and a significant amount of groundwater is drawn upon for irrigation. San Joaquin and Calaveras Counties have no designated sole-source aquifers. The project is located within a 100-year floodplain, designated as Zone A by FEMA.

3.10.2 IMPACT DISCUSSION

QUESTION A

Construction activities associated with the Proposed Project would result in temporary disturbance within and adjacent to Bear Creek, a perennial stream. Direct effects on Bear Creek would include temporary fill in the creek bed for construction of the temporary creek crossing, excavation, and pile driving for construction activities, which would result in deposition of debris and dust during the demolition process.

Best Management Practices (BMPs) would be implemented to help prevent debris and dust from entering Bear Creek. As discussed in **Appendix E**, if construction in the creek bed cannot be limited to dry months, permit conditions shall include provisions for sediment control during construction and removal of fill within the creek. All conditions within the RWQCB Section 401 Water Quality Certification, USACE Section 404 Nationwide Permit, and CDFW Section 1602 Streambed Alteration Agreement shall be met.

Due to the depth of excavation required for the pier and abutment piles (approximately 25 feet below ground surface), dewatering of groundwater may be necessary. If dewatering were required, a diversion or isolation plan would be developed and utilized during pile drilling. To prevent discharges from dewatering from affecting water quality, any water produced from the dewatering activities would be pumped, treated, and discharged in accordance with applicable regulations and Proposed Project permits, including the General Waste Discharge Requirements and NPDES Permit for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters. The treatment of any pumped groundwater prior to discharge would prevent affecting water quality if the effluent contains high levels of chemical pollutants or sediment.

The Proposed Project may result in potential impacts on surface water quality, groundwater quality, and site drainage during construction and operation. These impacts are described in more detail in **Appendix E**, and mitigation measures are recommended within this section to maintain a less than significant impact on the water quality.

Required permits include CWA Section 404 Nationwide Permit from USACE, CWA Section 401 Water Quality Certification from RWQCB, Section 1602 Streambed Alteration Agreement from CDFW, and NPDES General Permit from the SWRCB.

No long-term impacts are anticipated with operation and maintenance of the Proposed Project. However, the **Mitigation Measures WQ-1 through WQ-5** would avoid and minimize the Proposed Project's effects on water quality. **Less Than Significant with Mitigation.**

QUESTION B

No groundwater or groundwater wells will be either affected or developed as a result of the Proposed Project. The Proposed Project is not likely to reach depths where the groundwater supply could be accessed. However, dewatering may be required during removal and installation of the support structure if work cannot be completed during the dry season. Dewater may also be required during the installation of the abutment piles if groundwater is included. If groundwater is encountered during construction activities, all water produced from dewatering would be pumped, treated, and discharged according to state and regional permits and regulation. During in-water work, all best management practices (BMPs) would be used to reduce the amount of sediment and debris that may be produced. **Less Than Significant Impact.**

QUESTION C (I)

The Proposed Project involves construction activities which include excavation, placement of rock and fill, and pile drilling, demolition, bridge pier construction, and regrading of creek banks, which could result in a temporary increase in turbidity and sediment loads in Bear Creek. Construction activities could also result in increased erosion on the project site, potentially degrading downstream water quality during storm events. Potential sources of debris, dust, and sediment loading are discussed in **Appendix E**.

To prevent increased sediment loading and erosion, BMPs would be implemented to help prevent debris and dust from entering Bear Creek.

Construction activities will take place within the creek bed, if possible, occur during dry months when no water is present in Bear Creek within the project site. As discussed in **Appendix E**, if construction in the creek bed cannot be limited to dry months, permit conditions shall include provisions for sediment control during construction and removal of fill within the creek. All conditions within the RWQCB Section 401 Water Quality Certification, USACE Section 404 Nationwide Permit, and CDFW Section 1602 Streambed Alteration Agreement shall be met.

As discussed in **Appendix E**, during construction, surface water runoff shall be controlled by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures such as terraces, dikes, and ditches shall collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, check dams, hay bales, or similar devices shall be used to reduce runoff velocity and erosion. Fuel and vehicle maintenance areas shall be established away from all drainage courses and design these areas to control runoff.

Since the existing bridge would be removed, the overall net change in impervious surface area would be minimal. The operation and maintenance of the Proposed Project would have no long-term impacts on runoff or water quality and the project design would likely decrease drift accumulation impacts in the vicinity of the project site. **Less Than Significant Impact with Mitigation.**

QUESTION C (II)

As discussed above, since the overall net change in impervious surface area would be minimal, the amount of increased impervious surfaces would be minimal, and would result in a negligible increase of surface runoff. The negligible increase in surface runoff would not significantly impact any potential flooding on- or offsite. **Less Than Significant.**

QUESTION C (III)

Runoff water landing on Bollea Road and Bollea Road Bridge would drain towards Bear Creek and would not exceed the capacity of existing or planned stormwater drainage systems.

During the construction phase of the Proposed project, construction and demolition activities have potential to increase dust, debris, and sediment loading which may provide additional sources of polluted runoff. Mitigation measures to reduce sediment loading, prevent erosion,

and protect water quality are discussed under Question A and in **Appendix E. Less Than Significant with Mitigation.**

QUESTION D

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. The project is located within a 100-year floodplain, designated as Zone A by FEMA (FEMA, 2009). The proposed project includes an increased profile grade for the new bridge which will be raised to pass the 100-year storm event in conformance with the Caltrans Design Manual. The resulting structure from the Proposed Project will have an increased capacity to handle a flood event.

In-stream work is scheduled to be completed during the dry season, so there is minimal risk of run-off with increased sediment and erosion during the construction phase of the project, in the event a storm event occurs during the dry season. **Less Than Significant Impact.**

QUESTION E

There is no implemented water quality control plan regarding the Proposed Project. Additionally, a sustainable groundwater management plan would not pertain to the Proposed Project as no groundwater would be disturbed as a result of the construction or operation of the Proposed Project. **No Impact.**

MITIGATION MEASURES

WQ-1: Installation of Temporary Fencing around Bear Creek

All in-stream work shall be limited to the minimal area required for construction of the Proposed Project. Prior to commencement of construction, the County shall ensure that temporary construction barrier fencing and/or silt fencing is installed north of the existing bridge and south of the proposed temporary creek crossing. Construction personnel shall not disturb fenced-off portions of the creek. The exact location of the fencing shall be determined by a qualified water quality specialist in coordination with the project engineer. The fencing shall be checked regularly and maintained until construction activities are complete.

WQ-2: Restore Disturbed Areas to Pre-Project Conditions

All temporarily disturbed areas shall be returned to pre-project conditions upon completion of Proposed Project construction. All fill utilized for construction of the temporary creek crossing shall be removed from Bear Creek to the maximum extent possible.

WQ-3: Limit In-Stream Work to Dry Season

All in-stream construction activities shall be performed during the dry season when no water is present in Bear Creek. In the event that it is not possible to complete in-stream work during the dry season, project permits shall include provisions for dewatering, removal of fill within the stream, and sediment control. All construction activities shall conform to all applicable conditions within the issued permits.

WQ-4: Develop and Implement Dewatering Plan

If dewatering is required, the contractor shall develop a dewatering plan describing the methods, materials, quantities, and locations of dewatering activities. All dewatering discharges shall adhere to the requirements of the General Waste Discharge Requirements and NPDES Permit for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters. A Notice of Intent shall be submitted to the CVRWQCB for approval before dewatering activities.

WQ-5: Develop and Implement a Stormwater Pollution Prevention Plan

Construction contractors shall comply with the SWRCB NPDES General Permit. The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the CWA. To comply with the NPDES permit, the County shall file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (i.e., erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), including a description of the type and location of erosion and sediment control BMPs to be implemented at the project site; and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP shall include the following:

1. The construction contractor shall install a containment boom around the work area to contain floating debris, and shall provide a vessel to retrieve debris from the containment area at the end of each work day.
2. Straw bales, wattles, fiber rolls, gravel bags, or equivalent devices shall be installed along the western perimeter of the Geysers project and stockpiled materials that are exposed to the environment to prevent debris from being transported to the Delta Pond via runoff.
3. The use of hazardous materials during construction shall be minimized to the extent practical, and the amount of hazardous materials stored on or adjacent to the embankment shall be limited to what is needed to immediately support construction activities.
4. Inactive material stock piles must be covered and bermed at all times.
5. In the case of a rain event, active debris boxes shall be covered during rain events to prevent contact with rainwater.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.11 LAND USE AND PLANNING

Would the project:

a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.11.1 ENVIRONMENTAL SETTING

The Proposed Project site is located west of central Wallace in a rural, unincorporated area. The Proposed Project site and the existing Bollea Road bridge itself contained therein lie on the borders of San Joaquin and Calaveras Counties. Wallace is a census-designated place with an estimated population of fewer than 900 individuals. It is centered within northwestern unincorporated Calaveras County, across CA Highway 12 from the Proposed Project site approximately 0.3-mile. The Proposed Project site lies along Bollea Road, a rural road intersecting with CA Highway 12 approximately 1,500 feet northeast of the existing Bollea Road bridge. Six rural residential properties lie south of the existing Bollea Road bridge. The nearest residence is approximately 325 feet southeast of the Bollea Road bridge. As noted in **Section 2.1.1 Existing Setting**, the Proposed Project site includes banks of Bear Creek, pasture and agricultural land, and a vehicle storage yard on both sides of Bollea Road.

Bollea Road is an existing ROW easement for each of San Joaquin and Calaveras Counties where it lies within their respective borders. The location of Bollea Road within the existing ROWs varies based on location. In Calaveras County, the road is centered within the 50-foot ROW. In San Joaquin County, the roadway centerline is shifted approximately 5 feet to the east.

3.11.2 REGULATORY SETTING

As described in **Section 2.1.1 Existing Setting**, the San Joaquin County General Plan designates the land parcel southeast of Bollea Road along the county border as A/G (General Agriculture) with AG-80 zoning, and the two land parcels northeast of the road adjacent to the existing bridge as OS/RC (Resource Conservation) and A/G, both with AG-80 zoning. The Calaveras County General Plan designates the land use along Bollea Road north of the county boundary as CC (Community Center) with M4 zoning (Business Park), and a small portion paralleling the road northeast of the county boundary as RR (Rural Residential). Community Center zoning is for mixed residential and commercial use to serve community residents and visitors.

3.11.3 IMPACT DISCUSSION

QUESTION A

The Proposed Project would replace an existing bridge on an existing roadway that passes through agricultural and grazing fields and open space, with surrounding rural residential land uses and a vehicle storage yard. Nearby residences are not located directly adjacent to the Proposed Project site and residences are dispersed at low-density along Bollea Road. Further, adjacent properties do not have structures that would be potentially affected by the project. The nearest medium-density residential community is located in central Wallace, across CA Highway 12 to the north of the Proposed Project site and approximately 0.3-miles northeast. The Proposed Project would divert traffic throughout the duration of construction along the temporary emergency bypass bridge constructed after the existing Bollea Road Bridge became impassible to vehicles in December 2017. The Proposed Project would create a new bridge that improves access for residences south of the bridge along Bollea Road, and would only remove the temporary bypass bridge after the new bridge has been opened for public use. The Proposed Project would not establish a barrier for residents to move amongst the local community. Therefore, the Proposed Project site would have **no impact** on dividing or disrupting access within an established community.

QUESTION B

The Proposed Project is located within OS/RC, A/G and CC zoning of San Joaquin and Calaveras Counties. The Proposed Project would not entail alteration of land use and would therefore remain compatible with zoning designations. Nor would it establish new businesses or residences that would increase the local population beyond population growth estimates utilized in each County's General Plan to assess long-term planning concerns. The project would replace and improve an existing structurally deficient bridge to meet AASHTO standards and, as described further in Section **3.17.2 Transportation and Circulation** below, is therefore consistent with the plans and goals of the Counties' General Plans to maintain and improve an efficient, effective and safe transportation network.

As described in **Section 2.2.2 Construction**, minimal acquisition of temporary and permanent ROW would be required for roadway alignment and the roadway embankment. Temporary ROW would be required on private rural residential land. The roadway alignment is intended to comply with AASHTO standards. It would consist of 0.03-acre east of Bollea Road within San Joaquin County, and the entire roadway within Calaveras County between the County line and the railroad easement approximately 280 feet north of the Proposed Project site (MGE 2017). The land in Calaveras County is designated as CC land use with M4 zoning, and RR land use. Community Center zoning is for mixed residential and commercial use to serve community residents and visitors. These zoning and land use designations allow for a temporary emergency access road and roadway access improvement. Therefore, the Proposed Project would not conflict with any County land use plan, policy, or regulation and the impact would be **less than significant**.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.12 MINERAL RESOURCES				
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.12.1 ENVIRONMENTAL SETTING

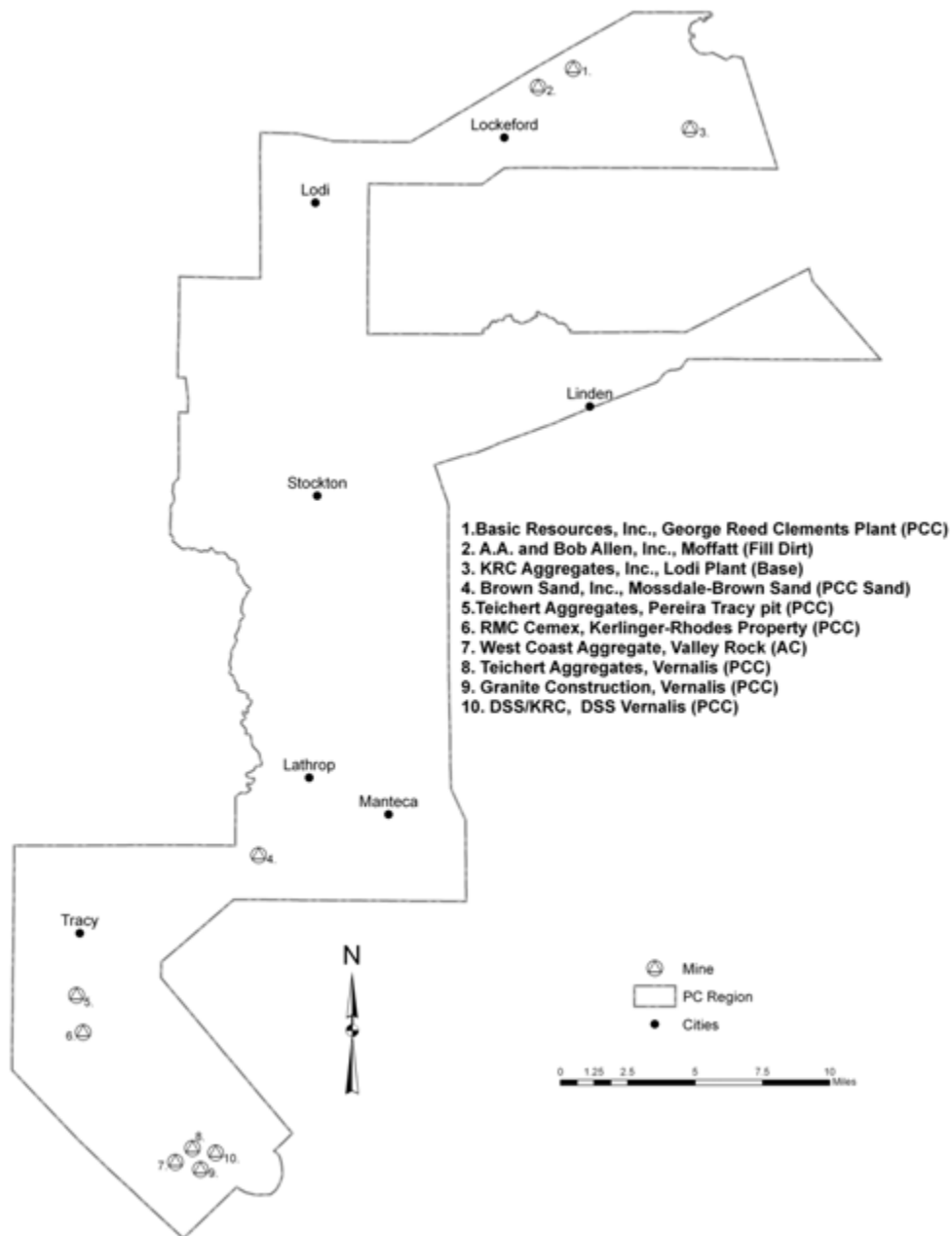
Portions of the Proposed Project site located in San Joaquin County are within the Stockton-Lodi Production-Consumption (P-C) Region, which covers 430 square miles and includes large portions of developed and developing areas of San Joaquin County (DMG, 1988). The California Department of Conservation (CDC)'s Division of Mines and Geology (DMG) has classified land that contains resources for Portland cement concrete (PCC) aggregate in the Stockton-Lodi P-C Region. This includes sand, gravel, and stone deposits that are suitable as sources of PCC aggregate, high-grade construction aggregate which is costly to transport (DMG, 1988). The land classification within the Stockton-Lodi P-C Region is presented in the form of Mineral Resource Zones (MRZ) on 17 California Geological Survey (CGS) topographic quadrangles (DMG, 1988). MRZ range from 1 to 4, with MRZ-1 designated as having no significant mineral resources or where there is little likelihood for their presence; and MRZ-2 as having significant mineral deposits or a high likelihood for their presence (CGSDC, 2012). The Proposed Project site is located in an MRZ-1 zone.

The Proposed Project site is located in the CGS-designated Wallace Quadrangle, in the Mokelumne River production area of the P-C Region. Based on CGS estimates, between 1986 and 2010, production of aggregate ranged from approximately 3.1 to 11.5 million tons per year in the P-C Region; in 2010, approximately 3.2 million tons of aggregate were produced (CGSDC, 2012). Approximately 232 million tons of PCC-grade aggregate reserves were projected remaining in the P-C Region as of 2010, and approximately 969 million tons of PCC aggregate resources of all types, permitted and unpermitted for extraction, were remaining (CGSDC, 2012).

Three active mines for PCC aggregate are located west of the Proposed Project site in the P-C Region, as shown in **Figure 3.12-1** below. The nearest is southwest of the Proposed Project site approximately 3.7 miles at the KRC Aggregates, Inc. Lodi Plant. This plant mines base-

grade aggregate (CGSDC 2012). It is accessible via Clements Road and Brandts Road south of CA Highway 12/Highway 88, east of the Proposed Project site. The Basic Resources, Inc. George Reed Clements Plant is located approximately 5.8 miles west of the Proposed Project site and mines PCC-grade aggregate (CGSDC 2012). Lastly, the A.A. and Bob Allen, Inc. Moffatt is located approximately seven miles southwest of the Proposed Project site and mines fill dirt (CGSDC 2012). Each of these facilities are accessible along CA Highway 12/Highway 88, east of the Proposed Project site.

Figure 3.12-1 LOCATION OF ACTIVE MINES PRODUCING AGGREGATE MATERIAL IN THE STOCKTON-LODI P-C REGION



Source: CGSDC, 2012.

The Calaveras County General Plan Resource Production Element notes that no lands within the County are designated by the CGS Mining and Geology Board as mineral areas of regional or statewide significance (CC, 2019a). The San Joaquin County General Plan Natural and Cultural Resources Element notes that County-wide mineral resources include sand and gravel aggregate, consistent with those resources of the Proposed Project site (CC, 2019a). Lands designed by the CGS as MRZ-2, containing or with the likelihood of containing significant mineral resources, should remain Agricultural or Open Space until the resources have been extracted. In addition, development on such sites are required to obtain a discretionary permit to protect the resources (CC, 2019a). The Plan notes that the County intends to update the Development Title with a Mineral Resource Overlay Zone, as designated by the State Division of Mines and Geology, between 2017 and 2022 (CC, 2019a). Lands of the Proposed Project site within San Joaquin County are designated as MRZ-1 by the CGS.

3.12.2 IMPACT DISCUSSION

QUESTION A

The Proposed Project site is located south of CA Highway 12 on the easternmost edge of the P-C Region. As such, it may contain PCC aggregate resources; however, no mining permit currently exists on the lands of the Proposed Project site. Further, the Proposed Project site is not along an access route to active mines. All local mines in the P-C Region, located in the CGS-designated Wallace and Clements Quadrangles, are accessible via CA Highway 12/ Highway 88 east of the CA Highway 12–Bollea Road intersection. Therefore, the Proposed Project would have a **less than significant** impact on access to and availability of known mineral resources.

QUESTION B

The Calaveras County General Plan Resource Production Element notes that no lands within the County are designated by the CGS Mining and Geology Board as mineral areas of regional or statewide significance (2019). The County of San Joaquin General Plan Natural and Cultural Resources Element notes that lands designated as MRZ-2 must have Agricultural or Open Space land uses to ensure protection of underlying mineral resources, and a discretionary permit must be obtained for development on these lands. The Proposed Project is located in an MRZ-1 area. Further, it would not alter land use designations in either San Joaquin or Calaveras Counties. The new roadway alignment as part of the Proposed Project would require acquisition of additional permanent ROW, consisting of 0.03-acre east of Bollea Road within San Joaquin County and the entire roadway within Calaveras County, between the County line and the railroad easement (MGE, 2017). The proposed ROW is within the MRZ-1 area and would not affect surrounding land uses or result in the loss of available mineral resources on the Proposed Project site. Therefore, the Proposed Project would have **no impact** on the loss of available resources as delineated on local land use and general plans.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.13 NOISE				
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project in the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.13.1 ENVIRONMENTAL SETTING

The project involves noise-generating construction and demolition activities. Three residences are located within 1,000 feet of the project, with the closest distance being approximately 240 feet. Construction activities would take place during normal working hours. The San Joaquin County Noise Ordinance 9-1025.9 specifically exempts construction-related noise, provided that construction activities take place between the hours of 6:00 am and 9:00 pm and the Calaveras County Noise Ordinance exempts construction-related noise, provided that construction activities take place between the hours of 7:00 am and 6:00 pm.

The nearest airport is Howard Private Airport, which is located north of the Camanche Reservoir. The Proposed Project is located approximately 14 miles away from Howard Private Airport by road, and is not located near any public airport.

SENSITIVE NOISE RECEPTORS

The nearest sensitive receptors to the Proposed Project site are three residences located within 1,000 feet of the Proposed Project site. The nearest residence is approximately 325 feet southeast of the existing Bollea Road bridge.

3.13.3 IMPACT DISCUSSION

QUESTIONS A, B, C AND D

As noted above, construction noise is exempt from both San Joaquin and Calaveras County noise ordinances as long as construction occurs within the hours of 7:00 A.M. to 6: P.M. (utilizing the more conservative of the two). With the implementation of **Mitigation Measure NOI-1**, construction would be required to be conducted within the time frame ensuring the exemption is applicable to the Proposed Project during the entirety of construction. **Less than Significant with Mitigation.**

Post-construction operation would not expose persons to noise levels in excess of standards established in the local general plan nor would the project introduce new noise sources compared to the existing conditions. There would be no anticipated growth associated with the bridge and therefore no associated indirect increases to the ambient noise environment. Accordingly, ambient noise levels would be consistent with existing conditions. **Less than Significant.**

QUESTIONS E AND F

The Proposed Project site is located 13 miles west of the project site and therefore outside of any designated airport land use plans. **No Impact.**

MITIGATION MEASURES

NOI-1: Through contractual obligations, construction activities shall be conducted between the hours of 7:00 A.M. and 6:00 P.M. in accordance with the Calaveras County Noise Ordinance.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.14 POPULATION AND HOUSING

Would the project:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.14.1 ENVIRONMENTAL SETTING

As described in **Section 2.1.1 Existing Setting**, the Proposed Project is located near the unincorporated community of Wallace, which has a population of fewer than 900 residents. The majority of this population lives east of the Proposed Project site across US Highway 12. Six residential properties lie on Bollea Road, all southeast of the existing bridge. The road has an ADT of approximately 26 vehicles per day and projected ADT of 42 vehicles per day in 2032 (Caltrans, 2020c).

3.14.2 IMPACT DISCUSSION

QUESTIONS A AND B

The Proposed Project would provide improved access to and from the six residential parcels south of the existing bridge. The bridge replacement would increase safety and reliability for the estimated average of 26 vehicles that use Bollea Road on a daily basis, but would not otherwise restrict or block access to any neighborhood or community, nor would the bridge replacement induce an increase in residents or visitors in the area, as it does not involve residential development. As discussed in **Section 2.2.2 Construction**, the temporary emergency bypass crossing Bear Creek would remain in place during the course of construction and would be removed upon completion of the new bridge. No residential housing or businesses would be displaced by the Proposed Project. The construction would be relatively minor and the construction workers would likely be supplied from within one of the two Counties, from nearby population centers. No additional housing would be expected necessary to accommodate construction workers or accommodate local resident displacement. Therefore, **no impact** would occur to population growth, infrastructure use, or need for housing to accommodate workers or displaced individuals.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.15 PUBLIC SERVICES				
Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
a) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.15.2 ENVIRONMENTAL SETTING

The Calaveras Consolidated Fire Protection District (Cal-Co Fire) provides protection, suppression, and emergency medical services for 163 square miles of western Calaveras County, including the unincorporated community of Wallace (Cal-Co Fire, 2014). Cal-Co Fire has five full-time personnel and roughly 50 volunteers that provide services to approximately 15,000 residents (Cal-Co Fire, 2020). The nearest station to the Proposed Project site is Company 1 in Burson, at 3255 Helisma Road, approximately five miles east on US Highway 12. Company 1 has an active engine company and is staffed 24 hours a day.

Additionally, the Proposed Project site is not located within a Very High Fire Hazard Severity Zones (FHSZ) (OSFM, 2007a; OSFM 2007b). As mentioned in **Section 3.4 Biological Resources**, habitat on the Proposed Project site includes Bear Creek riparian creek bed and bank, which has seasonally flowing water, limited oak woodland, and mixed riparian habitat. No buildings exist within the Proposed Project site; infrastructure includes one communications overhead line, the existing bridge on Bollea Road, and an emergency bypass constructed approximately 15 feet east of the existing bridge. A vehicle storage yard also exists on both sides of Bollea Road.

The Proposed Project site is served by the Calaveras County Sheriff's Office. The nearest police department is located approximately 8.5 miles east of the Proposed Project site at 200 Highway 12 in Valley Springs, California (CC, 2020c).

No public schools exist in the nearby unincorporated community of Wallace. The nearest public schools are in San Andreas and Valley Springs, California. These are approximately 15 miles and 7 miles from the community of Wallace, respectively. Bollea Road lies east of central Wallace and is not a main thoroughfare for the community. Calaveras Unified School District (CSUD) has 11 schools serving children ages kindergarten through high school (CUSD, 2020). Fourteen school districts lie in the County of San Joaquin. The nearest is Linden Unified School District (LUSD), approximately 10 miles east of Stockton south of the Proposed Project site. LUSD has four elementary school serving 1,610 students, one high school serving 670 students and a continuation high school serving 45 students (LUSD, 2020).

The nearest park to the Proposed Project site is Camache Reservoir Recreation Area, whose nearest entrance from the Proposed Project site is approximately four miles northeast, across US Highway 12 via Camanche Parkway. No other public parks or recreation areas are in the vicinity of the Proposed Project site.

3.15.2 IMPACT DISCUSSION

QUESTION A

The Proposed Project would not result in an increase in the use of public services that would result in the need for new or physically altered government facilities. With the replacement of the Bollea Road Bridge and removal of the emergency bypass, construction and operation of the Proposed Project would not cause significant impacts to service ratios, response times, or other performance objectives to fire protection, police protection, parks, or other public facilities in the area.

Construction- and demolition-related impacts include the potential fire threat associated with equipment and vehicles coming into contact with vegetated areas. Construction vehicles and equipment may accidentally spark and ignite vegetation or building materials. The increased risks of fire during the construction of the proposed replacement bridge and subsequent removal of the emergency bypass would be similar to that found at other construction sites. However, the Proposed Project site is not located within a Very High FHSZ (OSFM, 2007a; OSFM 2007b) and construction workers would abide by County construction and safety regulations. Furthermore, roadway realignment would improve safety and accessibility of the Bollea Road bridge that provides access to the six residences to the south. The new bridge would improve usability for fire vehicles and equipment and other emergency response vehicles. Upon completion, the Proposed Project site would be rarely occupied by workers except for routine roadway and utility line maintenance and monitoring. These operations would be sparse throughout the year and therefore would not result in increased needs for fire protection that would result in interruption of current service levels. Therefore, the Proposed Project would have a **less than significant impact** to fire protection services during construction and operations.

QUESTION B

The Proposed Project would result in a negligible increase in demands on the Calaveras County Sheriff's Office due to the limited size and scope of the project. Calls for service would not be disproportionate to other small-scale construction and demolition operations in the area. No habitable structures are being developed as a result of the Proposed Project which might increase demand for police protection services. Furthermore, the replacement bridge is intended to increase roadway safety compared to the existing bridge, reducing potential for police and emergency services along Bollea Road. Construction and operation of the Proposed Project would not result in an interruption in the current service levels within the County. Therefore, impacts from Proposed Project would be **less than significant**.

QUESTION C

The Proposed Project does not involve the construction of residential buildings nor would construction or operation require an increased number of people residing in the vicinity of the Proposed Project site. LUSD and CUSD would not experience an increase in students as a result of the Proposed Project, nor is Bollea Road a thoroughfare that would have potential to disrupt commutes to schools. Therefore, there would be **no impact** to local or regional schools.

QUESTION D

The Proposed Project does not involve the construction of residential buildings nor would construction or operation require an increased number of people residing in the vicinity of the Proposed Project site. As described in **Section 3.16 Recreation**, the nearby Camanche Reservoir would not experience an increase in visitors, nor would its entrance road experience an increase in traffic, as a result of the Proposed Project. The Proposed Project would therefore have **no impact** to nearby parks.

QUESTION E

Development of the Proposed Project would not lead to an increase in the unincorporated community's population, and would therefore not result in an increased demand for public services such as public health services and library services. Other public facilities are not located adjacent to the Proposed Project site or located along Bollea Road. Because the Proposed Project would not result in a population increase and not affect other public facilities, the Proposed Project would have **no impact** on other public facilities.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.16 RECREATION				
Would the project:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.16.1 ENVIRONMENTAL SETTING

As discussed in **Section 2.1.1 Existing Setting**, Bollea Road is an unincorporated area crossing the borders of San Joaquin and Calaveras Counties. Surrounding land uses include agriculture and grazing, open space and rural residential. The nearest recreational site to Bollea Road is Camanche Reservoir, located north of Highway 12 approximately one mile. Camanche Reservoir is a public facility of the East Bay Municipal Utilities District (EBMUD) with 12 square miles of lake and 53 miles of shoreline. Camanche Reservoir provides recreational opportunities such as fishing, hiking, camping, boating, swimming, kayaking, picnicking, bird watching, and equestrian trails (EBMUD, 2020). No County- or City-owned or –operated parks are located near the Proposed Project site. Bear Creek runs through the Project Site. This creek runs seasonally and is not used for public recreation. Wallace Lake in the unincorporated community of Wallace also lies approximately 0.6-mile east of the Proposed Project site across Highway 12. The land surrounding the lake is privately owned and the lake is separated from Bear Creek.

3.16.2 IMPACT DISCUSSION

QUESTION A AND B

The Proposed Project does not involve the construction of buildings nor would construction or operation of the upgraded Bollea Road bridge cause an increased number of residents or visitors in the vicinity of the Proposed Project site. The nearby Camanche Reservoir would not experience an increase in visitors as a result of the Proposed Project, nor would access to the Camanche Reservoir be impacted by the Proposed Project. The closest access to Camanche Reservoir from the Proposed Project Site is along Camanche Parkway north of Highway 12. Bear Creek is not used for public recreation in the area surrounding the Proposed Project site; therefore, the emergency bypass route has no impact on recreational use at the Proposed

Project Site. Further, the bypass route would be removed upon completion of the new bridge construction and the north and south banks would be restored to their pre-project condition prior to the storm of December 2017. Therefore, the Proposed Project would have **no impact** on the use or quality of recreational facilities in the immediate vicinity or near the Proposed Project site.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.17 TRANSPORTATION AND CIRCULATION

Would the project:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.17.1 ENVIRONMENTAL SETTING

The Proposed Project site is approximately 0.3-mile west of the unincorporated community of Wallace, which has a population of less than 900 people. The Proposed Project site is approximately 1,500 feet down Bollea Road from State Highway 12 to the north. Site access occurs from the northern entrance of Bollea Road, where the highway intersection is stop-controlled. Bollea Road is a rural minor access road that ends just south of the Proposed Project location. Bollea Road bridge provides highway access for six residences located south of the bridge.

State Highway 12 is the main thoroughfare in the community of Wallace, connecting the Cities of Lodi and Stockton in San Joaquin County to the unincorporated community of San Andreas in Calaveras County. The two-lane highway travels in an east–west direction from State Route 116 in Sebastopol in Sonoma County to State Route 49 north of San Andreas in Calaveras County.

Bollea Road does not have a posted speed limit, resulting in a prima facie 55 mile per hour speed limit, except in the vicinity of the bridge where the curves are posted for 25 miles per hour (MGE, 2017). Since Bollea Road has a current ADT of 26 and a projected 2032 ADT of 42, the roadway and bridge geometrics are governed by the AASHTO Design of Very Low Volume Roads (MGE, 2017). The existing roadway width (from the southern edge of pavement to the northern edge of pavement) ranges from 16 feet south of the bridge to 20 feet north of the bridge, with graded shoulders (MGE, 2017).

The existing Bollea Road bridge crossing Bear Creek is a straight structure comprised of two rail cars welded together to create a 19.5-foot clear width of the structure. The existing bridge was determined structurally deficient in 2010 with a sufficiency rating of 46.8, and is eligible under the Federal Highway Bridge Program (HBP) for replacement (MGE, 2017). The roadway approaches from the north and south are tangential to the bridge, creating an angle point where the bridge meets the north approach. Additionally, the elevation of the existing bridge is higher than the north and south approaches, resulting in a rise in the roadway at the north and south bridge abutments (MGE, 2017). This difference in grade, coupled with adjacent trees and vegetation, and the angle point in alignment at the north approach, causes a visual impediment for vehicles approaching the bridge (MGE, 2017).

As noted in **Section 2.1.1 Existing Setting**, due to heavy storm flows in December 2017, the Bollea Road bridge south abutment was undermined. This caused the south abutment to settle approximately one foot and caused the bridge to become impassible to vehicles. In order to maintain traffic and access to nearby residences, a single-lane detour consisting of a pipe culvert low-water crossing was constructed approximately 15 feet to the east of the existing bridge (MGE, 2017). The detour consists of four corrugated metal pipes (one 36" and three 48" diameter pipes) bedded and backfilled with gravel (MGE, 2017). The upstream and downstream sides of the detour have been armored with rock slope protection. The driving surface consists of 12-wide compacted Class 2 aggregate base over geotechnical fabric (MGE, 2017). This detour would remain in place through construction of the replacement bridge.

3.17.2 REGULATORY SETTING

Each city in San Joaquin County has control over the land use and development decisions within its limits. The County coordinates and cooperates with cities in areas proposed for future annexation located within the unincorporated territory under County jurisdiction (CCG, 2017). The unincorporated community of Wallace is located in northwestern Calaveras County and does not have an adopted General Plan. As the Proposed Project site lies outside of the community of Wallace, the San Joaquin County and Calaveras County General Plans apply to transportation regulations and policies on the Proposed Project site lands located within each respective County.

The Public Facilities and Services Element of the San Joaquin County General Plan (SJC, 2016a) addresses the location and extent of planned transportation routes and facilities and includes goals, objectives, and policies affecting the mobility of current and future residents, businesses, and visitors. Goals include maintaining a safe, efficient and effective roadway system and transportation network throughout the County. It also includes goals for improved alternative transportation routes, including safe and efficient bicycle and pedestrian networks; use of emerging transportation technologies and services; maintaining a reliable public transportation system; and maintaining congestion management practices (SJC, 2016a).

The Circulation Element of the Calaveras County General Plan (CC, 2019) addresses the location and extent of existing and planned transportation routes needed to accommodate future travel demand and addresses transportation funding. The transportation plan, policies, and implementation measures are based upon an evaluation of the traffic volumes that would occur

from expected development through 2035. Goals of the Element include fostering a circulation system that provides for the safe and efficient movement of people and goods, maintaining safe, effective and efficient roadway, public transit and aviation systems (CC, 2019a).

The 2018 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) prepared by the San Joaquin Council of Governments (SJCOG), with assistance from member jurisdictions and stakeholders, is an update to the 2014 RTP/SCS adopted as a result of the Sustainable Communities and Climate Protection Act of 2008 (SB 375, described further in **Section 3.8.2 Greenhouse Gas Emissions: Regulatory Setting**). The RTP/SCS coordinates future transportation projects and land use strategies to prioritize a multi-modal investment plan covering a 24-year period extending to 2042 (SJCOG, 2018). It will be updated every four years using growth forecasts and economic trends projected over the Plan's time frame (SJCOG 2018). The RTP/SCS considers the role of transportation in the context of economic, environmental, and quality-of-life goals. While the SCS land use scenario has no land use authority in San Joaquin County jurisdictions, SB 375 allows CEQA streamlining for projects in the County that are deemed consistent with the SCS (SJCOG, 2018).

The 2017 Regional Transportation Plan prepared for the Calaveras Council of Governments (CCG) is an update to the 2012 RTP. It serves as the planning blueprint to guide transportation investments in Calaveras County involving local, state and federal funding through 2037 (CCG, 2017). The Plan involved input and coordination of the County, Caltrans, the City of Angels, government resource agencies, commercial and agricultural interests, California Valley Miwok Tribe and County citizens (CCG, 2017). The plan also considers growth forecasts and economic trends projected over the plan's time frame, reflecting economic, environmental and quality-of-life goals. As noted in **Section 3.8.2 Greenhouse Gas Emissions: Regulatory Setting**, Calaveras County is not included in an MPO and therefore is not required to have an SCS (CC, 2018).

3.17.3 IMPACT DISCUSSION

QUESTION A

Construction of the Proposed Project would temporarily result in a negligible increase in traffic volume along Bollea Road. Vehicular trips from construction would consist of worker trips and deliveries of equipment and materials to and from the Proposed Project site. The expected increase in traffic would occur weekdays between the hours of 6 am and 9 pm.

The Proposed Project does not entail a change in land use from surrounding agricultural, grazing, open space and rural residential. The Proposed Project would not introduce factors that would generate new or unanticipated long-term changes in ADT or vehicle miles traveled (VMT), such as residences and facilities. Therefore, no direct or cumulative population growth would occur that is not already incorporated in regional growth projections of Counties' RTPs and General Plans and reflected in County policies and ordinances related to transportation. Further, the Proposed Project is intended to replace a structurally deficient bridge with a bridge that meets AASHTA standards, improving visibility and access for users. No changes to access control of the highway intersecting with Bollea Road approximately 1,500 feet north of the

Proposed Project site would occur as a result of the project. The Proposed Project supports goals of both the Calaveras County and the San Joaquin County General Plans of improving safety, efficiency and effectiveness of transportation systems. Therefore, it would have a **less than significant impact** on programs, plans, ordinances and policies addressing the circulation system for both Calaveras and San Joaquin Counties.

QUESTION B

The Bollea Road bridge serves six residences located south of the bridge on Bollea Road. It has a current ADT of 26 and a projected 2032 ADT of 42 (MGE, 2017). The Proposed Project does not entail a change in land use from surrounding agricultural, grazing, open space and rural residential. The Proposed Project also would not introduce factors that would generate new or unanticipated long-term changes in ADT or VMT, such as residences and facilities. Roadway capacity would be unaffected. Therefore, the Proposed Project would not conflict or be inconsistent with CEQA Guidelines § 15064.3(b)(2) and impacts would be **less than significant**.

QUESTION C

As noted above, the difference in grade of the existing bridge versus its north and south approaches, the adjacent trees and vegetation, and the angle point in the alignment at the north bridge approach cause a visual impediment for vehicles approaching the bridge (MGE, 2017). To improve drivability and sight distance, the new bridge alignment would be curved with a four percent super-elevation (MGE, 2017). A 375-foot radius roadway realignment would be performed to accommodate a 40 mile per hour vehicle speed, with the profiles on the north and south approaches designed to eliminate the current difference in grade from the bridge (MGE, 2017).

For existing bridges that are to be replaced due to structural deficiency where no site-specific safety problems exist, the AASHTO Design of Very Low Volume Roads permits a bridge to be replaced at the existing width (MGE, 2017). The existing clear width of the Bollea Road bridge is 19.5-feet, and, per an MGE MGE technical assessment, there is no evidence of a safety problem; therefore, the proposed clear width of the new bridge would be 20 feet (MGE, 2017). The approach roadway width would conform to the existing roadway width at the beginning and end of construction and would widen to 20 feet at the bridge. The realigned Bollea Road would have a minimum of two-foot graded shoulders (MGE, 2017).

As the Proposed Project is composed of replacing the existing bridge to current AASHTO standards and removing the emergency bypass, the only operational use involved would be ongoing maintenance of the roadway and utility line on the Proposed Project site. Roadway and bridge maintenance needs are likely to be reduced from those of the existing bridge and emergency bypass crossing Bollea Creek. By complying with the AASHTO Design of Very Low Volume Roads and not altering surrounding land uses, the Proposed Project would have a **less than significant** impact on hazards due to geometric design features or compatible uses.

QUESTION D

The Proposed Project would replace a bridge deemed structurally deficient with a more

structurally sound bridge. The existing bridge was determined structurally deficient in 2010, with an AASHTO sufficiency rating of 46.8 (MGE, 2017). Due to a winter storm in December 2017 that caused the existing bridge to become impassible to vehicular traffic, a single-lane emergency bypass was constructed across Bear Creek approximately 15 feet south of the existing bridge. As mentioned above, the bridge replacement would be intended to improve safety and accessibility, improve line of sight on the approach by leveling the north and south approach grades to that of the bridge, and realign the roadway to reduce angle of approach. These alterations would aide passenger and emergency vehicle access compared to the current single-lane emergency bypass road crossing Bear Creek, as well as improve access compared to the state of the bridge prior to the December 2017 storm. The temporary detour would remain in place until the new bridge has been completed. Upon completion of the project, all property owners and emergency vehicles would be able to access the properties south of the bridge in the same manner as before the project. Additionally, construction impacts to traffic would be negligible and temporary. A 0.32-acre construction staging would be located on-site adjacent to the existing bridge north of the emergency bypass route. Therefore, the project would have a **less than significant** impact on emergency access along Bollea Road.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.18 TRIBAL CULTURAL RESOURCES				
Would the project:				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.18.1 ENVIRONMENTAL SETTING

A Sacred Lands File search and a list of Native American contacts were requested from the Native American Heritage Commission (NAHC) on February 27, 2017. On February 28, 2017, the NAHC responded that the Sacred Lands File did not include any cultural resources within a 0.5-mile radius of the Proposed Project site. The NAHC cautioned that the Sacred Lands File list is not exhaustive and does not preclude the discovery of resources during project-related groundbreaking activity. The NAHC also provided a list of Native American contacts who may have information about the Proposed Project area (**Appendix D**).

On March 2, 2017, AES began the outreach process by sending comment solicitation letters to the following Native American contacts listed with the NAHC:

- The California Miwok Tribe
- Washoe Tribe of Nevada and California, Darrel Cruz, THPO

- Calaveras Band of Mi-Wuk Indians, Debra Grimes, Cultural Resource Specialist
- Wilton Rancheria, Raymond Hitchcock, Chairperson
- Southern Sierra Miwuk Nation, Lois Martin, Chairperson
- Ione Band of Miwok Indians, Crystal Martinez, Chairperson
- North Valley Yokuts Tribe, Katherine Erolinda Perez, Chairperson
- Buena Vista Rancheria of Me-Wuk Indians, Rhonda Morningstar Pope, Chairperson
- Calaveras Band of Mi-Wuk Indians, Charles Wilson, Chairperson

AES also contacted the individuals listed above by phone on March 7, March 9, or March 13, 2017. Over the telephone, Darrel Cruz of the Washoe Tribe stated that the Proposed Project was outside Washoe territory and that they would defer to the local tribe. Katherine Perez asked about project specifics, particularly location information, and asked for an update after the survey; AES left her a voicemail on March 9 stating that no prehistoric archaeological sites had been identified during the survey. Robert Columbro emailed AES on March 13 requesting additional information; AES replied on March 15 and sent a copy of Proposed Project mapping as well as summarizing the results of the field survey (**Appendix D**).

On April 20, 2017 Ms. Debra Grimes, from the Calaveras Band of Mi-Wuk Indians, requested a field meeting with representatives of Caltrans and the County; this meeting was held on September 15, and included Debra Grimes, Gary Griffith and Ben Elliot from Caltrans, and Charlane Gross from AES. After the field meeting, Ms. Grimes sent an email stating that she had subsequently revisited the site and reviewed tribal information, concluding that she did not have high concerns for the proposed project, but stated that the Tribe would like to monitor on the Calaveras County side where tree removal will occur between the railroad grade and creek. (**Appendix D**).

3.18.2 REGULATORY SETTING

ASSEMBLY BILL 52

Assembly Bill (AB) 52 mandates early tribal consultation prior to and during CEQA review for those tribes which have formally requested, in writing, notification on projects subject to AB 52, i.e. projects which have published Notices of Preparation (NOPs) for EIRs or Notices of Intent to adopt NDs or MNDs since July 1, 2015 (PRC section 21080.3.1). The bill establishes a category of Tribal Cultural Resources (TCRs) for which only tribes are expert; TCRs may include a site feature, place, cultural landscape, sacred place, or object that is of cultural value to a Tribe. These resources may not necessarily be visible or archaeological, but could be religious or spiritual in nature. Significant impacts to a TCR are considered significant effects on the environment (PRC section 21084.2).

3.18.2 IMPACT DISCUSSION

QUESTION A

AES contacted the Native American Heritage Commission to request a search of the Sacred Lands Files and for a list of contacts of people who might have information regarding Tribal Cultural Resources near the Proposed Project Site. AES consulted with the individuals identified by the NAHC via mail, telephone, and in person during a site visit. No TCRs were identified during these efforts. Construction monitoring at locations of potential interest to the Calaveras Band of Mi-Wuk Indians would ensure that previously unknown cultural resources would be identified and treated appropriately, and therefore there are **No Impacts** to TCRs.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.19 UTILITIES AND SERVICE SYSTEMS				
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.19.1 ENVIRONMENTAL SETTING

North of the bridge and parallel with the west side of Bollea Road are existing utility poles owned and operated by AT&T that carry a single low-voltage overhead telecommunication line (MGE, 2017). High-voltage electrical lines are located to the south/east of the Proposed Project site. The utility line crosses to the east side of the road and continues south parallel to Bollea Road. The utility pole that was originally near the southeast abutment of the existing bridge has been relocated further south to permit the construction of the bridge and the emergency detour previously described (MGE, 2017). As a result of this relocation, the overhead lines no longer cross the bridge and should not conflict with construction of the replacement bridge (MGE, 2017). The 375-foot radius bridge alignment would not require the relocation of any power poles (MGE, 2017). No other utilities cross Bear Creek at the Proposed Project site.

Several landfills are present near the Proposed Project site. The nearest landfill in Calaveras County which accepts construction and demolition debris is Rock Creek Solid Waste Facility, located in Milton, California approximately 13 miles southeast of the Proposed Project site (CC, 2020b). This facility is approximately 201 acres in size and accepts up to 500 tons of waste per day. It has a remaining capacity of 6.6 million cubic yards (CalRecycle, 2019c). In San Joaquin County, two nearby facilities accept construction and demolition debris. Foothill Sanitary Landfill is located along the eastern border of San Joaquin County in Linden, approximately 11.5 miles southeast of the Proposed Project site. It is the largest landfill site in the County—approximately 800 acres—with an average daily volume of 566 tons and a permitted disposal quantity of 1,500 tons per day (SJC, 2013a). It has a remaining capacity of 125 million cubic yards (CalRecycle 2019a). North County Recycling Center and Sanitary Landfill is located in Lodi, San Joaquin County, approximately 9 miles southwest of the Proposed Project site. It encompasses 320 acres and receives an average of 541 tons of waste daily, with a permitted disposal quantity of 1,200 tons per day (SJC, 2013b). It has a remaining capacity of 35.4 million cubic yards (CalRecycle, 2019b).

No Special Districts serve the unincorporated area on the San Joaquin County side of the Proposed Project site; the closest Special District is approximately 5.5 miles west (SJC, 2019a). The unincorporated community of Wallace approximately 0.3-mile east of the Proposed Project site in northwestern-most Calaveras County receives water from Calaveras County Water District (CCWD, 2019). To serve Wallace, the CCWD draws water from two groundwater wells in the South San Joaquin Groundwater Basin (CCWD, 2019).

3.19.2 IMPACT DISCUSSION

QUESTION A

The Proposed Project would include replacement of the existing bridge, including roadway realignment and obtaining additional ROW. Construction would be followed by removal of the emergency bypass road approximately 15 feet east of the existing bridge. As noted above, the utility pole that was originally near the southeast abutment of the existing bridge has been relocated further south to permit the construction of the new bridge and the emergency bypass route. As a result of this relocation, the overhead lines no longer cross the bridge and should not conflict with construction of the replacement bridge (MGE, 2017). The 375-foot radius bridge alignment would not require the relocation of any power poles (MGE, 2017). Additionally, the Proposed Project would not require water, wastewater treatment or storm water drainage, natural gas, or telecommunications facilities. There would be **no impact** to the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, which could cause significant environmental effects.

QUESTION B AND C

As previously stated, the Proposed Project would not require water, wastewater treatment, or storm water drainage. Although the Proposed Project would include removal of the four culvert pipes placed across Bear Creek as part of the emergency bypass route, their removal upon completion of the new bridge would not constitute an expansion of wastewater infrastructure or

stormwater drainage. No water services or wastewater services would be required for the proposed project. Therefore, the Proposed Project would have **no impact** on water or wastewater providers or services.

QUESTION D AND E

Several landfills are present near the Proposed Project site that may be used for construction waste disposal, as described above. As the project involves replacement of the existing bridge followed by removal of the current emergency bypass route, a moderate amount of waste would be expected from construction and demolition that would be disposed in a regional landfill. The location of disposal would be determined at the time of construction. All three regional landfills have adequate daily disposal capacity to receive the solid waste generated by the Proposed Project. Further, the 2016 and 2019 CalGreen requirement of 65 percent waste diversion from landfills for new construction projects or substantial modifications, as noted in **Section 3.6.2: Energy: Regulatory Setting**, would be enforced as part of the Proposed Project's construction and demolition activities. The Proposed Project would adhere to all federal, State, and local statutes regarding waste reduction. Therefore, impacts to solid waste infrastructure, standards and regulations would be **less than significant**.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
3.20 WILDFIRE				
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.20.1 ENVIRONMENTAL SETTING

The Proposed Project site is located within the San Joaquin County and the Calaveras County Local Responsibility Areas (LRAs). Within the former LRA, the Proposed Project site is located within an Other Moderate FHSZ (OSFM, 2007a). Within the latter LRA, the Proposed Project site is located within a Moderate FHSZ (OSFM, 2007b). The Proposed Project site and surrounding areas are relatively flat and include agricultural, grazing and open space land, and rural residential properties. Bear Creek is an intermittently running creek that passes through the Proposed Project site.

3.20.2 REGULATORY SETTING

The County of San Joaquin and Calaveras County have adopted Emergency Operations Plans (EOPs) and Local Hazard Mitigation Plans (LHMPs) (SJCOES, 2019; SJC, 2017b; CC, 2019b; CC, 2015). These plans include evacuation routes, designation of emergency personnel, emergency preparation measures, emergency preventative measures, and comprehensive guidelines for emergency situations.

According to its LHMP, there are 22 emergency evacuation shelters for unincorporated Calaveras County (CC, 2015). In San Joaquin County, the nearest evacuation zone is in Clements, east of the Proposed Project, at Clements Fire Station and Clements Community Church (SJOES, 2019a). The Calaveras County Office of Emergency Services (OES) developed an electronic application (app) in May 2019 that provides County residents real-time updates on emergency evacuations routes based on their locations (Calaveras Enterprise, 2019).

3.20.3 IMPACT DISCUSSION

QUESTION A

The County of San Joaquin adopted an EOP in 2019 and a Revised LHMP in 2017; Calaveras County adopted an EOP in September 2019 and an LHMP in October 2015 (SJOES, 2019; SJC, 2017b; CC, 2019b; CC, 2015). The Proposed Project would not impair the implementation of these plans and would be developed consistently with any applicable policies contained therein. Therefore, **no impact** would occur.

QUESTION B

The Proposed Project is located adjacent to open lands including grassland, woody vegetation and riparian habitat. It crosses San Joaquin and Calaveras Counties, which are prone to wild fires. However, the Proposed Project is not located within a FHSZ designated as Very High; within the San Joaquin County LRA, the Proposed Project site is located within an Other Moderate FHSZ; and within Calaveras County, the Proposed Project site is located within a Moderate FHSZ (OSFM 2007a; OSFM, 2007b). Additionally, the Proposed Project consists of transportation infrastructure improvement and would not affect adjacent residential properties. Due to construction and demolition activities and close proximity to open lands in moderate FHSZs, the Proposed Project would cause a moderate increase in risk of fire and exposure of nearby residents to resulting pollutants during the course of construction. Both San Joaquin and Calaveras Counties have LHMPs to reduce wildfire hazards and EOPs to help aid residents located near the Proposed Project in the case of a wildfire. Construction workers would also be required to abide by local regulations to minimize potential of fire hazards. While the Proposed Project would increase risk of fire due during construction and demolition activities, by abiding by construction best practices and local regulations, the Proposed Project would have a **less than significant impact** on exposing workers and local residents to significant pollutant concentrations due to wildfire.

QUESTION C

The Proposed Project's components are all located within the established Proposed Project site and impacts related to the development of the Proposed Project are analyzed throughout this document. The Proposed Project would replace a bridge deemed structurally deficient with a more structurally sound bridge that complies with AASHTO standards. This alteration of roadway infrastructure is intended to increase safety via improved visibility and line of sight. A temporary bypass route has been constructed, and upon completion of the project all property owners along Bollea Road would be able to access their properties in the same manner as before. Normal roadway operations would not be significantly altered by the Proposed Project,

nor would access to US Highway 12 from Bollea Road. A 0.32-acre staging area located in the existing road bed would be used for equipment and materials storage on the Proposed Project site. Therefore, the Proposed Project would not impair use to roadways and other adjacent infrastructure. Furthermore, the Proposed Project would adhere to all adopted fire codes that pertain to the Proposed Project in San Joaquin and Calaveras Counties. No increased fire risk is associated with the Proposed Project, and environmental impacts would be **less than significant**.

QUESTION D

Roadway realignment as part of the Proposed Project would not encroach on the drainage channel located adjacent to the west side of the north bridge approach (Caltrans, 2019). In fill sections, the embankment side slopes would be in a ratio of three high to one vertical (3H:1V), except behind the guard rail, where it would be 2H:1V (Caltrans, 2019). This slope is in conformance with current San Joaquin County policies (Caltrans, 2019). The emergency bypass across Bear Creek includes four drainage culverts for the creek water to pass. The bypass would be removed as part of the Proposed Project, and the north and south banks would be restored to their pre-project condition (Caltrans, 2019). The restoration of the south bank that sloughed in the storm of 2017 could include benching and compacting earth fill to restore the bank geometry, and the installation of revetment to counteract future erosion (Caltrans, 2019). Alternatives to rock slope protection would be evaluated during project design (Caltrans, 2019). The Proposed Project would result in minimal permanent changes to the surface of the site, with embankment slope changes in conformance with County of San Joaquin policies. Therefore, people and infrastructure would have a **less than significant** risk of impact due to changes in runoff, post-fire slope instability, or drainage changes resulting from the Proposed Project.

	Potentially Significant Impact	Less-Than- Significant with Mitigation Incorporation	Less-Than- Significant Impact	No Impact
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3.21 MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.21.1 IMPACT DISCUSSION

QUESTION A

As discussed in the preceding sections, the Proposed Project has a potential to create short term impacts which could degrade the quality of the environment by adversely impacting biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, and noise. These provisions have been included as mitigation measures. For the other resources, with adherence to the applicable local, State and federal regulations, plans and policies identified within each section, potential impacts would be reduced to a less than significant level. The long-term effect of the Proposed Project would be an overall improvement in safety and access along Bollea Road, as well as decreased need for roadway and bridge maintenance in the vicinity of the Proposed Project site, and a return to a more natural flow of Bear Creek with the removal of the emergency bypass culverts. The Proposed Project would have a **less than significant impact with mitigation** on potential to substantially degrade quality of the environment, habitat and species populations.

QUESTION B

Potential adverse environmental impacts of the Proposed Project, in combination with the impacts of other past, present, and future projects, would not contribute to cumulatively significant effects on the environment with implementation of the mitigation measures presented within the resource sections. Conformance with General Plan policies, State standards, regional and local statutes would ensure that potential impacts would be individually limited and not cumulatively considerable in the context of impacts associated with other pending and planned development projects. Project-related impacts would be typical of bridge replacement projects in the Counties' General Plan areas, and would be reduced to **less than significant levels with mitigation** through conformance with General Plan Policies, State standards, regional and local statutes.

QUESTION C

After the implementation of design features, municipal code requirements, and standard conditions of approval, environmental effects of the Proposed Project would have a **less than significant** likelihood of causing a substantially adverse effect on human beings, either directly or indirectly.

SECTION 4.0 – PREPARERS

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APPENDICES

APPENDIX A

BA

Bollea Road Bridge Replacement Project BA



Biological Assessment

Bollea Road, San Joaquin County, CA
“Wallace, CA” 7.5 Minute Topographic Quadrangle, T4N R9E
Section 16, Mt. Diablo Baseline Meridian
Caltrans District 10
Bridge No. 29C-413
Federal Project No. BRLO-5929(236)

November 2019

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.



Biological Assessment

Bollea Road, San Joaquin County, CA
Caltrans District 10
San Joaquin County, California
Federal Project No. BRLO-5929(236)
November 2019

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Acronym List

AASHTO	American Association of State Highway and Transportation Officials
ac	Acre(s)
AES	Analytical Environmental Services
BA	Biological Assessment
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRLF	California red-legged frog
CTS	California tiger salamander
CWA	Clean Water Act
DO	Dissolved oxygen
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
ft	foot/feet
HBP	Federal Highway Bridge Program
GPS	Global positioning system
MBTA	Migratory Bird Treaty Act
mi	mile(s)
MSFCMA	Magnuson-Stevens Fishery Conservation and Management
NOAA FISHERIES	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NMFS	National Marine Fisheries Service
NWI	National Wetland Inventory
OHWM	Ordinary high water mark
ROW	right-of-way
RPW	relatively permanent water
RWQCB	Regional Water Quality Control Board
SR	State Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley elderberry longhorn beetle
°F	Degrees Fahrenheit
°C	Degrees Celsius

Biological Assessment Outline for Caltrans FESA Section 7 Consultations:
National Marine Fisheries Service and
U.S. Fish and Wildlife Service

Executive Summary

The purpose of this Biological Assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. This BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance. The document presents technical information on which later decisions regarding project impacts are developed.

The County of San Joaquin (County), in cooperation with Calaveras County, and Caltrans District 10, proposes to replace Bollea Road Bridge (No. 29C-0413) over Bear Creek. The Bollea Road Bridge Replacement Project (Proposed Project), is located on Bollea Road, just west of State Route (SR) 12 and the community of Wallace. The Proposed Project straddles both San Joaquin and Calaveras Counties and encompasses a total of 4.434 acres (ac). The study area is rural; surrounding land uses include rural residential uses, agriculture, and undeveloped open space. The existing structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for FHWA by Caltrans.

The purpose of the Proposed Project is to replace the existing structurally deficient structure with a new bridge that meets current American Association of State Highway and Transportation Officials (AASHTO) standard width requirements for a two-lane facility. The bridge, comprised of two railcars welded together, was built to create a 19-foot wide bridge intended to be a temporary replacement of a timber bridge that washed out in 1998. The replacement bridge would be constructed where the existing bridge is located, and the temporary creek crossing, will continue to be used as a detour route during construction. The Proposed Project would require replacement of the existing bridge, removal of the temporary bypass, and minimal acquisition of both permanent and temporary rights-of-way adjacent to the bridge.

The Action Area, for the Proposed Project consists of the project footprint and includes the project impact area totaling 4.434 acres. Surrounding land ownership includes privately held parcels and County-owned right-of-way (ROW). The bridge proposed for replacement is entirely within the County ROW, but project-related impacts such as construction of the temporary creek crossing, culvert removal, and nearby area, may partially occur on private land.

Both temporary and permanent impacts on habitats could result from the Proposed Project. Temporary impacts to Bear Creek and adjacent ruderal/disturbed habitats would occur due to the removal of the temporary stream crossing. Avoidance and minimization measures have been included to ensure that the removal of the temporary stream crossing and all other in-stream work occur during the dry season and that appropriate permits be obtained and adhered to. Under the Preferred Alternative (375-foot

curve), approximately 0.004 acre of permanent impact and 0.007 acre of temporary impact would occur to the Waters of the U.S. (Bear Creek) due to the temporary creek crossing. Implementation of the avoidance and minimization measures would lessen the impacts to a negligible level. Permits will be needed for the in streambed work. Most permanent impacts would occur within the existing ruderal/disturbed habitat.

The action area consists of the project footprint, the Caltrans right-of-way limits. The action area was developed by assessing the potential effects from the construction activities the habitat quality and existing disturbance of the surrounding area. The habitat types within the action area consist of ruderal grassland, riparian, ruderal/disturbed, riverine, lacustrine, topographic depression and drainage ditches. The project will have approximately 0.395 acre of permanent impacts and 0.094 acre of temporary impacts.

An updated species list was provided by U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NOAA Fisheries), for the Action Area (see **Appendix B**). The following federally listed species and Essential Fish Habitat were determined to be absent from the action area primarily due to the lack of appropriate habitat and will no longer be considered:

- Delta smelt (*Hypomesus transpacificus*) – T
- vernal pool fairy (*Branchinecta lynchi*) – T
- vernal pool tadpole shrimp (*Lepidurus packardii*) – E
- giant garter snake (*Thamnophis gigas*) – T
- Steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus*) – T
- Essential Fish Habitat (EFH) for Chinook salmon

The remaining federally listed species were identified to potentially be affected by the proposed action and is considered during the analysis:

- lone manzanita (*Arctostaphylos myrtifolia*) – T
- California tiger salamander (*Ambystoma californiense*) – T
- California red-legged frog (*Rana draytonii*) – T
- valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) – T

There will be *no effect* to all other species listed on the USFWS and NMFS species. With implementation of the conservation measures, compensatory mitigation will not be needed.

With this Biological Assessment, Caltrans is requesting informal consultation under section 7 of the Endangered Species Act. Caltrans is seeking a Letter of Concurrence from the USFWS for potential impacts to lone manzanita, California tiger salamander, California red-legged frog, and valley elderberry longhorn beetle.

Chapter 1. Introduction

1.1 Purpose and Need of the Proposed Action

San Joaquin County, in coordination Calaveras County and Caltrans District 10, is proposing to replace the existing bridge with a new bridge that meets current American Association of State Highway Transportation Officials (AASHTO) standard width requirements for a two lane facility. The existing structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for FHWA by Caltrans. The existing bridge would be removed to accommodate a replacement structure measuring 24 feet wide by 375 feet long; the replacement structure would accommodate two 10-foot-wide traffic lanes, two 2-foot-wide shoulders, for a total width of 24 feet. The replacement structure would meet the San Joaquin Flood Ordinance criteria for rural minor streams (2 feet of freeboard above the 100-year storm water surface elevation) and would improve the integrity and functionality of the existing creek crossing.

1.2 Threatened, Endangered, Proposed Threatened or Proposed Endangered Species, Critical Habitat

An updated species lists was provided by U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NOAA Fisheries), for the Action Area are provided in **Appendix B** (NOAA, 2019b). The following listed and proposed species, and/or designated critical habitat or Essential Fish Habitat (also shown in Table 1) were identified on the updated federal species lists and were considered during this analysis:

- lone manzanita (*Arctostaphylos myrtifolia*) T
- California tiger salamander (*Ambystoma californiense*) T
- California red-legged frog (*Rana draytonii*) T
- Delta smelt (*Hypomesus transpacificus*) T
- vernal pool fairy shrimp (*Branchinecta lynchi*) T
- valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) T
- vernal pool tadpole shrimp (*Lepidurus packardii*) E
- giant garter snake (*Thamnophis gigas*) T
- Steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus*) – T
- Essential Fish Habitat (EFH) for Chinook salmon

An effect determination for each of these species is included in Table 1. Table 1 includes an evaluation of the specific habitats required by each species listed above, and the specific habitats and habitat conditions present in the Action Area. Based on this evaluation, it was determined whether the species had potential to occur in the Action Area. Special status species that were observed, or determined to potentially occur in the Action Area based on availability of suitable habitat or other factors such as plucking posts, scat, nests, dens, etc., are discussed more fully in Section 4 of this report. Species determined unlikely to occur in the Action Area based on these same factors are documented accordingly in Table 1 and not discussed further in this report.

Table 1: Federally-Listed or Candidate Species, Critical Habitat and Essential Fish Habitat
Potentially Occurring or Known to Occur in the Action Area

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	DETERMINATION	RATIONALE
PLANTS					
lone manzanita	<i>Arctostaphylos myrtifolia</i>	FT	Found in clay or sandy acidic, lone soil in chaparral and cismontane woodlands at elevations of 60-580 meters	May Affect, <u>Not</u> Likely to Adversely Affect	The species was not observed during the site survey, which was conducted during the bloom season for this species.
ANIMALS					
Amphibians					
California red-legged frog	<i>Rana draytonii</i>	FT	Found in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation at elevations of 0-1160 meters.	May Affect, <u>Not</u> Likely to Adversely Affect	The Action Area contains potentially suitable breeding habitat within the pond but the closest sighting is over 5 miles away. See further discussion in Chapter 5.1.2.
California tiger salamander	<i>Ambystoma californiense</i>	FT	Found in vernal pools, ephemeral wetlands, and seasonal ponds, including constructed stockpools, in grassland and oak savannah plant communities at elevations of 0-460 meters.	May Affect, <u>Not</u> Likely to Adversely Affect	The project site provides low-quality upland estivation habitat in the ruderal/grassland habitats within the Action Area. See further discussion on Chapter 5.1.3.
Fish					
steelhead - Central Valley (CV) DPS	<i>Oncorhynchus mykiss irideus</i>	FT	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	No Effect	Habitat for CV Steelhead is unavailable due to multiple fish barriers downstream of the Action Area and lack of flowing water during majority of the year.
Delta smelt	<i>Hypomesus transpacificus</i>	FT	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	No Effect	Not within the known or historic range for this species.
Invertebrates					
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	Found in vernal pools and seasonal wetlands that fill with water during fall and winter rains and dry up in the spring and summer. Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary. Need to inhabit areas that are free of predators.	No Effect	The project site does not contain wetlands or vernal pools.
valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	Found in riparian forest communities. Exclusive host plant is elderberry (<i>Sambucus</i> species), which must have stems \geq 1-inch diameter for the beetle.	May Affect, <u>Not</u> Likely to Adversely Affect	Two elderberry shrubs were observed within the Action Area. Riparian and upland habitat within or adjacent to

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	DETERMINATION	RATIONALE
					the Action Area contains potential suitable habitat. Further discussion is provided in Section 5.1.5.
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	The life cycle is within vernal pools and valley foothill grassland swales.	No Effect	The project site does not contain wetlands or vernal pools.
Reptiles					
giant garter snake	<i>Thamnophis gigas</i>	FT	Inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands. Requires adequate water during its active season (early spring through mid-fall) to provide food and cover, emergent, herbaceous wetland vegetation for foraging and cover, grassy banks and openings in waterside vegetation for basking, and higher elevation uplands for cover and refuge from flood waters during its dormant season (winter). Inhabits small mammal burrows and other soil crevices with sunny exposure along south and west facing slopes, above prevailing flood elevations when dormant.	No Effect	The project site does not contain suitable habitat. The nearest occurrences are located more than 10 miles away from the project site in various drainage canals and waterways near the San Joaquin Delta.
Critical Habitat / Essential Fish Habitat					
Chinook EFH	<i>Oncorhynchus tshawytscha</i>	EFH	Essential Fish Habitat (EFH) for Chinook salmon is designated within the action area. EFH for Pacific salmon covered under the Pacific Coast Salmon Fisheries Management Plan administered through the MSA.	No Adverse Effects	Although EFH has been designated on the NOAA Fisheries list for the "Wallace, CA" 7.5-minute topographic quadrangle, the portion of Bear Creek within the BSA lacks the important elements (HAPCs) that comprise EFH. In addition, habitat for chinook salmon is unavailable due to multiple fish barriers downstream of the Action Area. Based on this, the Action Area does not contain EFH for chinook salmon and therefore the Project would not adversely modify EFH.
Codes: FT – federally-threatened CE – California endangered CH – Critical Habitat EFH – Essential Fish Habitat P – Fully Protected					

Candidate Species

No federal candidate species will be affected by the proposed action.

Critical Habitat

The Action Area addressed within this document does not fall within any designated critical habitat for listed species (USFWS, 2019a). The nearest critical habitat is for California tiger salamander and is approximately 4.6 miles southeast of the Action Area.

1.3 Consultation History

No consultation has occurred prior to the submission of this document.

1.4 Description of Proposed Action

1.4.1 Project Summary

The Proposed Action, identified by Federal Project Number BRLO-5929 (236), involves replacement of the Bollea Road Bridge (No. 29C-413) and removal of an emergency bypass crossing. San Joaquin County, in coordination Calaveras County and Caltrans District 10, is proposing to replace the existing bridge with a bridge that meets current AASHTO standard width requirements for a two lane facility in conformance with the guidelines presented in the Design of Very Low Volume Local Roads. The existing structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for FHWA by Caltrans.

The Proposed Action includes the removal of the existing bridge to accommodate a replacement structure measuring 24 feet wide by 375 feet long. The new structure would be composed of two 10-foot-wide traffic lanes and two 2-foot-wide shoulders and would shift the bridge approximately 4-feet to the east. In addition, the new structure would relocate at least one power pole and include minor grading, depending on in-field and final designs. The staging area is 0.32-acre and will be located within the existing road bed while the detour is in place. The new structure would meet the San Joaquin Flood Ordinance criteria for rural minor streams (two (2) feet of freeboard above the 100-year storm water surface elevation) and would improve the integrity and functionality of the existing creek crossing.

Traffic will be maintained during the Proposed Action through the continued use of a temporary emergency creek crossing upstream of the existing bridge. The temporary creek was installed under an emergency permit and consists of four pipes, three 48-inches in diameter and one 36-inches, surrounded by gravel and topped with Class 2 aggregate base. The crossing is located approximately 15 feet east of the existing bridge and connects Bollea Road on either side of the creek.

1.4.2 Authorities and Discretion

Waters of the U.S.

The USACE has primary federal responsibility for administering regulations that concern Waters of the U.S. (including wetlands) under Section 404 of the Clean Water Act (CWA). Section 404 of the CWA regulates the discharge of dredged or fill material into Waters of the U.S. The USACE requires that a permit be obtained if a project proposes the placement of structures within, over, or under navigable waters and/or discharging dredged or fill material into waters below the ordinary high water mark

(OHWM). The USACE has established a series of nationwide permits (NWP) that authorize certain activities in Waters of the U.S. The term discharge of dredged material means any addition of dredged material, including redeposit of dredged material other than incidental fallback, into Waters of the U.S. The term includes any addition, including redeposit other than incidental fallback, of dredged material, including excavated material, into Waters of the U.S. which is incidental to any activity, including mechanized land clearing, ditching, channelization, or other excavation (33 CFR 232.2(3)(i-iii)).

In addition, a Section 401 Water Quality Certification is required to comply with CWA Sections 301, 302, 303, 306, and 307 and is regulated by the Regional Water Quality Control Board (RWQCB). Anyone that proposes to develop or operate a project that may result in a discharge to U.S. surface waters and/or “waters of the state” including wetlands (all types) year round and seasonal streams, lakes, and all other surface waters would require a federal permit. At a minimum, any beneficial uses lost must be replaced by a mitigation project of at least equal function, value, and area. Waste Discharge Requirements Permits are required pursuant to California Water Code Section 13260 for any persons discharging or proposing to discharge waste, including dredge/fill, that could affect the quality of the waters of the state.

Federal Endangered Species Act of 1973

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) implement the federal Endangered Species Act (FESA) of 1973 (16 USC Section 1531 et seq.). Under the FESA, threatened and endangered species on the federal list and their habitats (50 CFR Subsection 17.11, 17.12) are protected from “take” (i.e., activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) as well as any attempt to engage in any such conduct, unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with incidental take provisions are rendered from the lead federal agency. Pursuant to the requirements of the FESA, an agency reviewing a Proposed Action within its jurisdiction must determine whether any federally listed species may be present within the project site and vicinity and determine whether the Proposed Action will potentially significantly impact such species.

Under the FESA, habitat loss is considered to be a significant impact to species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]). Therefore, project-related impacts to these species, or their habitats, would be considered significant and require mitigation.

Under the FESA, critical habitat may be designated by the Secretary of the Interior for any listed species. The term “critical habitat” for a threatened or endangered species refers to specific areas within the geographical range of the species at the time it is listed that contain suitable habitat for the species, which may require special management considerations or protection, and specific areas outside the geographical range of the species at the time it is listed that contain suitable habitat for the species and is determined to be essential for the conservation of the species. Under Section 7 of the FESA, all federal agencies (including the USFWS and NMFS) are required to ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of a listed species or modify their critical habitat.

Migratory Bird Treaty Act

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 Code of Federal Regulations (CFR) 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbances that cause nest abandonment, nestling abandonment, or forced fledging, is considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting season. The general nesting season extends from February through September, though it may be refined based on the number, types, and location of migratory bird species found to be present on a property. Implementation of mitigation measures, such as having a biological monitor on-site or conducting preconstruction surveys may further increase the construction time frame and geographic extent of a project.

Bald and Golden Eagle Protection Act

In addition to protection offered through the MBTA, bald and golden eagles receive special protection under the Bald and Golden Eagle Protection Act. The Bald Eagle Protection Act was originally enacted in 1940 to protect bald eagles and was later amended to include golden eagles (16 USC Subsection 668-668). It prohibits the taking or possession of and commerce in bald and golden eagles, parts, feathers, nests, or eggs with limited exceptions. Bald and golden eagles may not be taken for any purpose unless a permit is issued prior to the taking. The statute imposes criminal and civil sanctions as well as an enhanced penalty provision for subsequent offenses.

1.4.3 Project Location

The Action Area is located along Bollea Road, at the border of San Joaquin and Calaveras County, and is centered roughly at latitude 38° 11' 36.20" N, longitude 120° 58' 57.28" W (**Figure 1**). The Action Area occurs within Section 16, Township 4 North, Range 9 East, Mount Diablo Baseline and Meridian, on the "Wallace, California" U.S. Geological Survey (USGS) 7.5-minute quadrangle map (USGS, 1965; **Figure 2** of **Appendix A**). An aerial photograph that illustrates the Action Area is shown in **Figure 3** of **Appendix A**.

1.4.4 Define Action Area

The Action Area encompasses the areas of direct project-related impacts, as defined by the County, as well as areas that could reasonably be anticipated to be affected as a result of project-related direct or indirect activities. This limit of disturbance extends to 50 feet beyond any foreseen permanent impacts. The disturbance limits was calculated by the county in the Area of Potential Effects map. The total area of this study area is 4.434 acres. There are 2.522 acres of ruderal grassland habitat, 0.445 acres of riparian habitat, 1.09 acres of ruderal/disturbed habitat, 0.102 acres of riverine (Bear Creek), 0.22 acres of lacustrine habitat, 0.021 acres of topographic depression, and 0.034 acres of drainage ditches. See Figure 4 in **Appendix A** for habitats within the Action Area, and **Table 2** for a summary of habitats within the Action Area. Representative site photographs can be seen in Figure 6 of **Appendix A**.

1.4.5 Conservation Measures

Project conservation measures for avoidance and minimization of federally-listed species include, but are not limited to, preconstruction surveys, environmental awareness training, demarcate of project

boundaries, and obtaining all required permits. All conditions within issued permits will be adhered to in addition to the measured outlined in **Section 5.2**.

1.4.6 Interrelated and interdependent Actions

No interrelated or interdependent actions are associated with the Proposed Action.

Chapter 2. Study Methods

2.1 Summary

Prior to conducting a site reconnaissance survey, the following literature and agency databases were queried and records of special-status species, and sensitive plant communities near the Action Area were reviewed:

- A USFWS Official Species List was queried for a report of federally listed special-status species with the potential to occur within the Action Area (USFWS, 2019b; **Appendix B-1**);
- A NMFS official Endangered Species Act species list requested by Caltrans, the federal lead agency, as designated by FHWA, and San Joaquin County as the project proponent (nonfederal lead agency) (NOAA, 2019b; **Appendix B-4**);
- The National Wetland Inventory (NWI) database was reviewed for any historical records of wetlands or aquatic features in the Action Area (USFWS, 2019I);
- Aerial photographs of the Action Area were also examined for potential habitat types (Figure 4, **Appendix A**);
- Mapping of listed Critical Habitat (CH) (USFWS, 2019a), EFH Mapper (NOAA 2019a);
- The California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB) Geographical Information System was queried for records of special-status species potentially found within the Wallace quadrangle and the eight surrounding quads: Goose Creek, Lone, Jackson, Clements, Linden, Valley Springs, Valley Springs SW, and Jenny Lind (CDFW, 2019); and
- The CNPS *Electronic Inventory of Rare and Endangered Plants*, was queried for special-status plant species records known to occur within the Wallace quadrangle and the eight surrounding quads (CNPS, 2019)

2.1.1 General Biological Survey/Vegetation Mapping

A general biological survey of the Action Area was conducted on March 8, 2017, by Analytical Environmental Services (AES) biologist David Moldoff to characterize the vegetative communities and record any wildlife species observed during the survey were identified and recorded. A follow up survey within the Action Area for special status animal species and focused bloom period survey was conducted on July 20, 2017 by Nick Bonzey and Sam Schoevaars of AES. The project boundary was determined using information provided by San Joaquin County to delineate the maximum area of direct impact associated with the Proposed Action. Biological surveys were conducted by walking transects across the Action Area and visually observing adjacent areas.

Naturally occurring vegetation in the Action Area was classified according to A Manual of California Vegetation, Second Edition (Sawyer et. al. 2008), as appropriate. Vegetative habitats within the Action Area were classified according to their dominant plant species. Plants were identified to the extent possible given conditions at the time of the survey. The site was surveyed for the presence or potential habitat of federally-listed species. The names of the plant species are consistent with The Jepson Manual: Vascular Plants of California, Second Edition (Baldwin, B.G., et. al., editors 2012).

2.1.2 Potential Jurisdictional Waters Determination and Delineation

Potential waters of the U.S. in the Action Area were delineated in accordance with the Army Corps of Engineers (ACOE) Wetland Delineation Manual (Environmental Laboratory, 1987); the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Region Supplement) (USACE, 2008a); Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE, 2016); and the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). The boundaries of potential Waters of the U.S. were delineated through standard field methodologies and all wetland data were recorded on USACE Aquatics Resources Excel worksheets, and the Arid West 2016 Regional Plant List (Lichvar et al, 2016).

On March 8, 2017, AES biologist David Moldoff conducted a delineation of the study area. He walked transects throughout the study area to determine the location of potential Waters of the U.S. Because all potential Waters of the U.S. could be delineated based on OHWM. The Waters delineated by OHWM followed criteria outlined in the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE, 2008b). Positional data was collected using a global positioning systems (GPS) handheld unit (Trimble GeoXH™) with sub-meter accuracy. Data was collected for soils, hydrology, and vegetation where necessary to determine the extent of potential waters of the U.S.

2.2 Personnel and Survey Dates

Site visits were conducted by AES biologist on two occasions. An initial site visit was conducted on March 8, 2017 by AES biologist David Moldoff with the goal of characterizing the vegetative communities and habitat types and conducting a delineation of the wetlands and other Waters of the U.S. and a focused bloom period survey within the Action Area. A follow up on general biological and focused bloom period survey was conducted on July 20, 2017 by Nick Bonzey and Sam Schoevaars of AES to identify special-status plant species within the Action Area.

2.3 Resource Agency Coordination and Professional Contacts

Consultation with the Region 8 USFWS will occur following submission of the Biological Assessment (BA).

2.4 Limitations and Assumptions that may Influence Results

The temporary bypass was first constructed before biological site visits were conducted, as seen in Figure 3 of **Appendix A**. Due to the timing of the preliminary site visits, the condition of the stream and adjacent uplands under the temporary bypass road is impossible to fully evaluate. However the upstream and downstream reaches of stream were assessed to provide a basis for evaluating the likely condition of the

impacted reach of stream for restoration baseline. During the biological evaluation, conditions were evaluated “as is.”

Multiple site visits were conducted to ensure that all of the special-status plant species identified in the USFWS, and NOAA/NMFS lists were within their identifiable period or bloom period during the time of the surveys. No other limitations were identified which may influence stated results.

Chapter 3. Environmental Baseline

The Environmental Baseline describes the setting in which the project will occur and includes the effects from past and present Federal, State, private actions; proposed Federal projects with completed section 7 consultations; and contemporaneous State or private actions with consultation in progress. The environmental baseline also considers non-permitted actions (i.e., other nonfederal actions occurring within the Action Area).

3.1 Habitat Conditions in the Action Area

The Action Area is located on the border of San Joaquin County and Calaveras County within the northern terraces of the Central California Valley. This area has a semi-arid Mediterranean climate regime characterized by hot, dry, sunny summers and cool, rainy winters. Summers are hot and dry with little to no rain, and winters are characterized by foggy days and cooler temperatures. The mean annual temperature range in San Joaquin County is approximately 46 to 75 degrees Fahrenheit (°F). The average annual precipitation range in San Joaquin County is approximately 0 to 15.5 inches, with the maximum usually occurring during the month of January. This climate data was collected from 1980-2010 (The Weather Channel, 2019).

The Action Area is situated within gently rolling terrain and is situated at elevations that range from approximately 177 to 269 feet (54 to 82 meters) above mean sea level. Bear Creek, a tributary to the Delta, flows westward through the Action Area. A topographical map of the surrounding area can be seen in Figure 2 in **Appendix A**. Bear Creek’s connection to the Delta occurs through a series of natural and agricultural canals, running approximately 33 miles to the southwest. The Action Area falls within climate Zone 12 (PG&E, 2019). Climate Zone 12 experiences cool winters and hot summers with winter rains typically occur from November to April, and high summer temperatures reaching over 100°F.

The Action Area is situated in a rural residential/agricultural setting west of the community of Wallace, CA. Surrounding land uses include rural residential, agriculture, and undeveloped open land. The Action Area is predominantly undeveloped and uncultivated. Several residences and associated structures are located nearby.

3.2 Summary of Environmental Baseline

The Action Area consists of the Bollea Road Bridge and surrounding area. It is located near the community of Wallace, along the San Joaquin and Calaveras County line in the Lower Bear Creek watershed. Bollea Road is a paved local County road that ends approximately 1,500 feet south of the Action Area and serves approximately 10 residential parcels. The habitats within the Action Area are relatively undeveloped and consist of riparian, ruderal grassland, riverine (Bear Creek), lacustrine (man-made pond), a topographic depression, and ruderal/disturbed habitats. Soils in the Action Area are

typical of the region and consist predominately of sandy loam. The percent of vegetative cover varied from 100 to 0 percent based on the habitat.

3.3 Describe the Action Area

The Action Area contains a variety of terrestrial and aquatic habitat types. These habitats include: ruderal grassland, riparian, ruderal/disturbed, riverine (Bear Creek), lacustrine (man-made pond), a topographic depression, and drainage ditches. A map that illustrates the terrestrial and aquatic habitat types within the Action Area is presented in Figure 4 of **Appendix A**. A complete list of vascular plant species observed within the study area can be found in **Appendix C**. The habitat types are discussed further below. Total acreages of each habitat community within the Action Area are shown in **Table 1** below.

TABLE 2.
HABITAT COMMUNITY ACREAGE

Habitat Community	Acreage
Ruderal Grassland	2.522
Riparian	0.445
Ruderal/Disturbed	1.090
Riverine	0.102
Lacustrine	0.220
Topographic Depression	0.021
Drainage Ditch	0.034

Ruderal Grassland

The ruderal grassland plant community is found in several patches within BSA, totaling 2.522 acres. The biological survey occurred outside of the primary blooming period for many species and as a result, identification to the lowest taxonomic level was not always possible. Species typical of this habitat type included; slender wild oat (*Avena barbata*), wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail chess (*Bromus madritensis ssp. madritensis*), clarkia (*Clarkia sp.*), orchard grass (*Dactylis glomerata*), wild hyacinth (*Dichelostemma capitatum*), blue wildrye (*Elymus glaucus*), red-stemmed filaree (*Erodium cicutarium*), meadow barley (*Hordeum brachyantherum*), barley (*Hordeum marinum*), smooth cats ear (*Hypochaeris glabra*), wild geranium (*Geranium dissectum*), Douglas' microseris (*Microseris douglasii*), prickly sow thistle (*Sonchus asper*), chickweed (*Stellaria media*), vetch (*Vicia villosa*). A flock of wild turkeys (*Meleagris gallopavo*) were observed in this habitat during biological site surveys. No other animals were observed within this habitat.

Riparian

Riparian habitat along either side of Bear Creek consists predominately of densely clumped oaks (*Quercus ssp.*), totaling 0.445 acres. A separate span of riparian habitat occurs in the northwestern portion of the Action Area. This riparian habitat is dominated by willows (*Salix ssp.*), oaks, and bare ground. Several species of migratory birds were observed in this habitat during the site survey.

Ruderal/Disturbed

Ruderal/Disturbed habitat occurs over 1.09 acres within the Action Area. This habitat is primarily paved roadways, gravel access roads, and driveways. Included in this habitat is the temporary bypass road, a

gravel and dirt fill road constructed over Bear Creek to allow access to the residents of Bollea Road while the bridge was repaired. This habitat is unvegetated and regularly maintained to allow for vehicle access.

Riverine (Bear Creek)

Bear Creek, a USGS blue-line intermittent stream, passes through the Action Area and flows generally from east to west. A USGS blue-line stream is a water course identified by the USGS as being potentially jurisdictional and must be investigated during preliminary environmental studies. The OHWM of the stream was delineated based on a drastic change in terrestrial vegetation, sorted coarse substrate, and undercut banks, all indicators of the regular presence of moving water within a riverine system. Within the stream channel, the bed consisted of silt and sand with dispersed cobble. Terrestrial vegetation was absent from the channel except for small amounts of algal mats downstream of the bridge. Aerial imagery and aquatic invertebrates were used to classify the stream as intermittent as water was present within the stream channel during the March 8, 2017 site visit. No fish or other aquatic animals were observed within the habitat. Some water was also present during the July site visit. The standing water was found on both the east and west side of the bridge during the July visit. The depths of the standing water averaged approximately 1.5 feet. Review of historic aerial imagery shows this reach of Bear Creek as mostly dry with some standing water between the months of August and February. The standing water observed during the months of August through February did not show connectivity to other reaches of the creek. No fish were observed within the habitat during site surveys, and evidence of bats living in the joints of the bridge above the creek was observed by sound and smell.

Lacustrine (Pond)

An approximately 0.22 acre man-made pond is fenced within private property in the northeastern portion of the BSA. It has raised berms on all sides with overflow culverts that spill into the roadside ditches. Vegetation is dominated by large willows (*Salix* spp.) and a clear OHWM was observed. This habitat could not be directly accessed due to a fence completely surrounding the feature. This pond is within the BSA but will not be impacted by the Proposed Project.

Topographic Depression

An approximately 0.021 acre topographic depression, with obvious wetland vegetation, was evaluated for the three parameters required to be considered a wetland. Although the herbaceous ground cover is 100% obligate vegetation (rushes), and wetland hydrology is present (observable surface water), an investigation of the soils revealed that it did not meet any of the hydric soil indicators for the Arid West Region and therefore do not meet the requirements for a wetland under the three-parameter wetland approach by the USACE.

Drainage Ditches

Drainage ditches are present throughout the Action Area in and adjacent to the ruderal grasslands. The drainage ditches are fully vegetated with grassland species and are included as ruderal grassland plant community (Habitat Type), since they do not create a distinct habitat. These non-jurisdictional features show no evidence of running water and appear to have been created wholly out of uplands for purposes of draining the adjacent agricultural fields and as roadside ditches to convey runoff. These roadside ditches, shown in Figure 4 of **Appendix A**, drain to the south towards Bear Creek. There is no direct hydrological connection between these ditches and the pond on the east side of Bollea Rd. The ditch on

the west side of Bollea Rd. connects to Bear Creek above the OHWM. The other ditches shown in Figure 4 flow into this ditch through a series of culverts under Bollea Rd. All of the ditches shown in Figure 4 are covered in dense grassland vegetation, and are all approximately 2 feet across from the top of one side to the other. These features total 748 linear feet within the Action Area, with an area of approximately occupy approximately 0.034 acres. No water was observed in these features, and no evidence of historically flowing water was observed within these features. No soil, vegetation, or hydrology features consistent with wetlands or other waters of the U.S. were observed within these features.

Chapter 4. Federally-Listed/Proposed Species and Designated Critical Habitat within Action Area

4.1 Federally-Listed/Proposed Species

Federally-listed species that may occur in the Action Area or surrounding region are listed in **Table 1**. Further description of each species is presented below.

4.2 Discussion of Species

4.2.1 lone manzanita (*Arctostaphylos myrtifolia*)

Federal Status – Threatened

State Status – None

lone Manzanita is a perennial evergreen shrub in the heath family (Ericaceae). It grows in chaparral and cismontane woodland habitats on acidic, lone soil that is clay or sandy at elevations that range from 60 to 770 meters above mean sea level. This species blooms from November through March and has a known range isolated to Amador and Calaveras Counties (CNPS, 2019).

4.2.2 California red-legged frog (*Rana aurora draytonii*)

Federal Status – Threatened

State Status – Threatened

California red-legged frogs (CRLF) require aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. Breeding aquatic habitats include pools and backwaters within streams, creeks, ponds, marshes, springs, sag ponds, dune ponds, and lagoons. CRLF also breed in artificial impoundments, including stock ponds. The breeding period is from November to March. Beginning with the first rains of fall, CRLF may make overland excursions through upland habitats. Most of these overland movements occur at night. CRLF may move up to 1.6 kilometers throughout one wet season. CRLF rest and forage in riparian vegetation (USFWS, 2019c). CRLF disperse from their breeding habitat to forage and seek summer habitat if water is not available. Summer habitats include spaces under boulders or rocks and organic debris, such as downed trees or logs; industrial debris; and agricultural features, such as drains, watering troughs, abandoned sheds, or hay-ricks (USFWS, 2019c). CRLF require 11-30 weeks of permanent water for larval development (USFWS, 2019c).

4.2.3 California tiger salamander (*Ambystoma californiense*)

Federal Status – Threatened

State Status – Threatened

CTS require suitable aquatic habitat for breeding and upland habitat for aestivation. Aquatic breeding habitat includes vernal pools, and seasonal and perennial ponds in grassland and oak savannah plant communities from sea level to approximately 1,100 meters (USFWS, 2019d). Aquatic breeding ponds are almost always found in grassland habitats. CTS do not breed in fast-flowing ephemeral streams because larva or eggs would be washed away and do not use permanent pools because potential for predation of eggs and larval stages exist where more permanent water exists. CTS spend most of their lives in upland habitats. In general, breeding occurs between December and March (USFWS, 2019d). Upland habitat consists of grassland and oak savannah with burrows of small mammals such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*). They cannot dig or maintain their own burrows, and consequently require the presence of burrowing mammals for burrow construction and maintenance.

4.2.4 Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

Federal Status – Threatened

State Status – None

The valley elderberry longhorn beetle (VELB) is completely dependent on its host plant, elderberry (*Sambucus* spp.), in and around California's Central Valley during its entire life cycle (USFWS, 1984). VELB larvae live within the soft pith of the elderberry where they feed for 1-2 years. Adults emerge from exit holes created by the larva just prior to pupation inside the wood of elderberry shrubs during the spring as the plant begins to flower. Adults generally emerge from late March through June, and adults are short-lived (USFWS, 1999e). The adults feed on the elderberry foliage up until they mate. Females lay their eggs in the crevices of elderberry bark. Upon hatching the larvae then tunnel into shrub stems and feed there. VELB typically utilize stems that are greater than one inch in diameter at ground level (USFWS, 1984). Due largely to the loss of riparian habitat within California's Central Valley, the VELB populations in the state had decreased to a point that in 1980 the USFWS listed the species as threatened pursuant to the FESA. In addition unoccupied suitable habitat is considered important to maintain connectivity between VELB metapopulations (USFWS 2019e). USFWS has designated Critical Habitat for this species in Sacramento County.

4.3 Survey Results

4.3.1 lone manzanita

There is one CNDDDB record for lone manzanita within 5 miles of the Action Area (CDFW, 2019). Habitat within the Action Area provides marginal suitable habitat for this species. No lone manzanita were observed during focused botanical surveys conducted during the evident and identifiable blooming period for lone manzanita on March 8, 2017 and July 20, 2017, to determine its presence within the Action Area

4.3.2 California red-legged frog

The Action Area contains suitable aquatic breeding habitat in the form of the man-made pond and limited habitat within the topographical depression. Bear Creek is not a suitable aquatic habitat for breeding, given that it is a perennial, fast-flowing creek during the rainy season. The lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF. There are no CNDDDB records of CRLF within 5 miles of the Action Area (CDFW, 2019). No CRLF were detected during the surveys.

4.3.3 California tiger salamander

There are 14 CNDDDB records within 5 miles of the Action Area, the closest non-breeding sighting of which is located 0.2 miles away (CDFW, 2019). CH for this species is identified approximately 4 miles to the southeast and approximately 4 miles to the northwest. No CTS were observed within the Action Area during the biological surveys conducted on March 8, 2017 and July 20, 2017. Although no ground squirrel populations were observed during the site survey, other fossorial mammal burrows were found in several locations in the Action Area within the ruderal/grassland habitats west of Bollea Rd. The burrows observed within the Action Area are low-quality and provide marginal suitable upland habitat for CTS. Two other locations west of the Action Area were also identified as having low-quality burrows. While the pond habitat and topographic depression may provide suitable aquatic breeding habitat for CTS they are both well outside of the known breeding locations. Bear Creek is not considered suitable breeding habitat for CTS given that it is an intermittent, fast-flowing creek during the rainy season. No CTS or high-quality active burrows were observed within the Action Area. No CTS were encountered in the topographic depression or within the entire Action Area.

4.3.4 Valley elderberry longhorn beetle

There are two CNDDDB records of VELB within 5 miles of the Action Area (CDFW, 2019). One record is located one mile to the north east (#210) and the second is approximately 4.75 miles to the west (#160). There is no CH within 5 miles of the project site. Riparian habitat along Bear Creek and the northwestern portion of the Action Area contains potentially suitable habitat for VELB (**Figure 4 of Appendix A**). Two blue elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs were documented growing in riparian vegetation within 165 feet of the Action Area. One elderberry shrub is located on the northern bank of Bear Creek, approximately 50 feet east of the Proposed Project permanent disturbance limits (**Figure 5 of Appendix A**). This plant is young with few branches reaching approximately 8 feet tall and its largest branch measured 1.125 inches in diameter. This young plant has a dripline of approximately 6 feet in diameter. No VELB exit hole were observed on any of the branches that reached 1 inch or more. No other evidence that would indicate current or past presence of VELB were detected.

The second elderberry shrub is located within the Proposed Project limits, on the north side of Bollea Road within a strip of riparian habitat approximately 30 feet north west of Bollea Road (**Figures 5 of Appendix A**). This plant may actually be a grouping of several mature elderberry shrubs with multiple stems that reach up to 15 feet tall and diameters up to 2.5 inches. This larger mature shrub/s create a dripline diameter approximately 30 feet. No VELB exit hole were observed on any of the branches that reached 1 inch or more. No other evidence that would indicate current or past presence of VELB were detected. This shrub/s is within a powerline right of way and appears to be regularly trimmed for vegetation management.

4.4 Status of Designated Critical Habitat in the Action Area

No designated critical habitat for any federally-listed species occurs within the Action Area (USFWS, 2019a).

Chapter 5. Effects of the Project on the Action Area

5.1. Effects of the Action

5.1.1 lone manzanita

Based on the biological review and site surveys, the lone manzanita would not be impacted during construction activities associated with the Proposed Project. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 5.2** (described below), as these measures will eliminate the chance of lone manzanita being present within the construction area. With implementation of these measures, the Proposed Project *may affect but is not likely to adversely affect* lone manzanita.

5.1.2 California red-legged frog

Suitable habitat for this species occurs within the Action Area around the man-made pond and limited habitat occurs within the topographic depression. While the Proposed Action will have no direct impact to these habitats, it may affect, but is not likely to adversely affect these species.

Construction activities associated with the Proposed Action could impact CRLF, since the lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF, and even though these areas are outside of the impact area, CRLF could pass through the construction areas while accessing these aquatic habitats if barriers to passage are not in place. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 5.2**, including preconstruction surveys, worker awareness training, and the placement of exclusionary fencing prior to construction initiation. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but is *not likely to adversely affect* CRLF.

5.1.3 California tiger salamander

Suitable habitat for this species occurs within the Action Area around the man-made pond and burrows. The Proposed Action will have no direct impact to these habitats, the construction activities associated with the Proposed Action could impact CTS, since low-quality estivation habitat for this species is present within the Action Area, if CTS was to enter the project work limits. However, all burrow areas observed west of Bollea Road would not be impacted under the preferred alternative (Figure 5 of **Appendix A**). Direct and indirect impacts to this species would be avoided through the implementation of conservation measures presented in **Section 5.2**, including preconstruction surveys, worker awareness training conducted prior to construction initiation, and avoidance of habitat through the placement of exclusionary fencing around the impact area. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but *not likely to adversely affect* CTS.

5.1.4 Valley elderberry longhorn beetle

Direct and indirect effects to VELB from removal of riparian and other native vegetation in the Action Area, including elderberry shrubs, could result in a slight decrease in the population due to the loss of individuals and/or habitat (USFWS, 2017). The conservation measures described in Sections 5.2 would decrease the severity of these effects. Although suitable habitat (two bushes) for this species are present within the Action Area, construction activities associated with the Proposed Project will not impact VELB since all known elderberry shrubs will be completely avoided and no signs of VELB were present in the elderberry shrubs within the Action Area. Direct and indirect impacts to this species would be avoided through the implementation of avoidance and minimization measures outlined in **Section 5.2** (described below) including worker awareness training conducted prior to construction initiation, and avoidance of elderberry shrubs through the placement of exclusionary fencing 20 feet from any elderberry shrub. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but *not likely to adversely affect* VELB.

5.2. Conservation Measures and Compensation Proposal

5.2.1 Conservation Measures

The following steps will be taken to avoid or minimize effects to federally-listed species that may be affected by the Proposed Action.

BIO-1: Obtain all Required Permits

Prior to construction, the Proposed Action shall obtain all required permits. Permits may include, but not be limited to, the following: USACE Section 404 Permit, RWQCB Section 401 Water Quality Certification, CDFW Section 1602 Streambed Alteration Agreement, and Construction General Permit Order 2009-009-DWQ Stormwater Pollution Prevention Plan. All conditions within the issued permits shall be adhered to.

BIO-2: Limit In-stream Work to Dry Season

All in-stream construction activities associated with the proposed project shall be performed during the dry season when no water is present in Bear Creek or when pooled water is not flowing. In-stream work is anticipated to be conducted during the dry season, defined as between June 15 and November 1, or the first significant rainfall, whichever comes first. This period coincides with the time of year when Bear Creek has little to no flow. In the event that it is not possible to complete in-stream work during the dry season, required permits will likely include provisions for dewatering, removal of fill within the stream, and sediment control. All construction activities shall conform to all applicable conditions within the issued permits.

BIO-3: Restoration of Stream Channel after Construction:

Before the end of construction, any work done to the new bridge alignment within the Bear Creek stream channel and during the removal of the temporary bypass road, the stream channel shall be restored to a condition allowing for connectivity of the Ordinary High-Water Mark (OHWM) and the bed and bank between the upstream and downstream sections of the BSA. All temporarily disturbed areas shall be returned to pre-project conditions upon completion of construction, including habitat contours. These

areas will be properly protected from washout and erosion using appropriate erosion control devices including coir netting, hydroseeding, and revegetation. The un-impacted areas above and below the work areas will serve as baseline for restoration evaluation.

BIO-4: Conduct Preconstruction Surveys for Lone Manzanita:

To re-verify the absence of listed plants within the impact area, a qualified biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines no less than 14 days prior to initiating ground-disturbing activities for lone manzanita. If any unanticipated evidence of species presence is found during the preconstruction survey, the biologist shall contact the County within one day following the survey and contact CDFW and/or USFWS for consultation on the identified species. All requirements provided by CDFW and/or USFWS at the time of consultation shall be adhered to.

BIO-5: Conduct Preconstruction Surveys for Special-Status Animal Species

No less than 14 days prior to initiating ground-disturbing activities, a qualified biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines for the following special-status species: CTS, CRLF, and VELB. If no evidence of special-status animal species are observed, no further mitigation is required. If any evidence of species presence is found during the preconstruction survey, the biologist shall contact the Lead County within one day following the survey and contact USFWS and/or CDFW for consultation on the identified species. All requirements provided by USFWS and/or CDFW and at the time of consultation shall be adhered to.

BIO-6: Conduct Environmental Awareness Training for Special-Status Species

Prior to construction commencement, all construction personnel shall participate in environmental awareness training regarding identification, descriptions, behavior and habitat indicators for all special-status species with the potential to be found within the Action Area. If new construction personnel are added, they must receive the mandatory training prior to initiating work. As part of the training, an environmental awareness handout shall be distributed to all personnel that describes and illustrates all special-status animal species with the potential to occur within the Action Area. In addition information on general measures that will be taken to protect these species as they relate to the Proposed Project, the penalties for non-compliance, and the boundaries of the Proposed Project site will be included. The handout shall also list any applicable permit conditions provided by each regulatory agency. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

BIO-7: Demarcate Work Area Boundary

In consultation with a qualified biologist, construction personnel shall demarcate the outer perimeter of the work area to prevent damage to adjacent habitat and to provide visual orientation to its limits. This fencing shall provide visual orientation to its limits of the work and survey cleared areas. Material appropriate for creating a barrier for animal species, such as properly installed silt fencing, shall be used, shall be installed prior to the start of construction, and shall be maintained in place and in good working order during all periods of construction. All persons employed or otherwise working in the Action Area shall be instructed about the restrictions that the marking represents. Properly installed and maintained

silt fencing could also serve as a barrier to special status species returning to the Action Area during construction.

BIO-8: Conservation Measures for California Tiger Salamander

While no impacts are anticipated, the following measures shall be implemented to avoid and minimize adverse effects to CTS as a result of the Proposed Project:

- No less than 14 days prior to initiating ground-disturbing activities, a Service-approved biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines for CTS or burrows capable of supporting CTS estivation or as refugia. These areas will be clearly marked and avoided by at least 50 feet. In accordance with mitigation measure BIO-7, the Action Area will be fenced with appropriate exclusion fencing to avoid CTS from inadvertently accessing the construction area. It is anticipated that all low quality burrows will thus also be avoided. If the burrows cannot be avoided, Caltrans will contact the Service to discuss additional measures that may be needed and obtain an Incidental Take Statement if needed.
- Prior to the start of construction activities, a Service-approved biologist will provide education and training sessions for all individuals that will be involved with site preparation or construction. The training will focus on habitat sensitivity and identification of salamanders. The training will include species description and behavior, general measures that will be taken to protect these species as they relate to the proposed project, the penalties for non-compliance, and the boundaries of the proposed project site. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
- Construction activities will be timed to occur during the dry season (May 1 - October 15) between 30 minutes after sunrise to 30 minutes before sunset to minimize potential effects to salamander dispersal. Work will not be conducted if raining. A Service-approved biologist will check the National Weather Service prior to each scheduled work day. No construction activities will be conducted in upland habitat areas where salamanders may occur if it is raining, if there is a greater than 70% chance of rain based on the National Oceanic and Atmospheric Administration's National Weather Service forecast on that work day, or within 48 hours following a rain even greater than 0.25 inch.
- The contractor will confine all equipment to designated work zones (including access roads and material/ equipment storage and staging area).
- All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from any water body.
- All construction pipe, culverts, or similar structures that are laid underground or stored at the construction site for one or more overnight periods will be capped or covered in a manner that excludes salamanders from entering the pipe. Long-term storage of pipes and other construction material should be placed on asphalt and raised above the ground by no less than 1.5 inches. All pipes shall be thoroughly inspected before being moved, buried, or capped. If during inspection a CTS is discovered inside a pipe, that section of pipe shall not be moved until the salamander has escaped on its own or USFWS and CDFW will be contacted for further instruction.
- Project personnel will exercise caution when commuting to the construction area to minimize any chance for the inadvertent injury or mortality of species encountered on major roads leading to and

from the construction area. Project-related vehicles and equipment will not exceed 20 mph in the action area.

- Vehicles and equipment will be thoroughly inspected for the presence of CTS prior to movement. If a CTS is found, USFWS and CDFW shall be contacted for further guidance. No equipment will be moved until the CTS have left voluntarily.
- Excavated areas 6 inches deep or more will be covered in a manner that exclude salamander or will be provided with escape ramps at a 3:1 slope. No gaps greater than 1 inch will be allowed within cover materials. Each covered excavation should be checked daily until the excavation is filled.
- All stakes, flagging, and fencing used to delineate the construction area will be removed no later than 30 days after construction and restoration are complete.
- A litter control program shall be instituted at the entire Project site. Contractors will provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage will be removed daily from the Project site.
- All fencing, flagging, debris, trash, and materials from work areas will be removed following completion of construction and habitat restoration activities.
- The USFWS and CDFW approved biologist shall have oversight over the implementation of all conservation measures, and shall have the authority to stop Project activities if any of the requirements associated with these measures are not being fulfilled.
- While highly unlikely, in the case of injured and/or dead CTS, USFWS shall be notified of events within one day and the animals shall only be handled by a USFWS and CDFW approved biologist. Injured CTS shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal shall be preserved and held in a secure location until instructions are received from the USFWS and CDFW regarding the disposition of the specimen or until USFWS or CDFW takes custody of the specimen. The applicant must report to USFWS and CDFW within one calendar day any information about take or suspected take of CTS. Notification must include the date, time, and location of the incident or of the finding of a dead or injured CTS. Work will stop immediately if an incident occurs until corrective actions are provided by the USFWS.

BIO-9: Conservation Measures for California Red-Legged Frog

In conjunction with conservation measures previously listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to CRLF as a result of the Project:

- Before the project activities begin, all construction personnel shall attend a Worker Environmental Awareness Training session conducted by a Service-approved biologist. The session shall describe CRLF and its habitat, address proper implementation of avoidance measures, and clarify the boundaries within which the project may be accomplished
- While there are no sightings within 5 miles to be safe, the potential breeding habitats, including the pond and topographic depression, shall be avoided as part of project design. In accordance with mitigation measure BIO-7, these habitats will be fenced off with barrier material to prevent CRLF from moving into the project site. This barrier will be constructed out of properly-installed silt fencing or an equivalent material to prevent movement of amphibians into the project site.
- Prior to commencing site disturbance, including vegetation and/ or ground disturbance, a Service-approved biologist(s) will be identified to monitor implementation of biological mitigation measures. The Service-approved biologist will be present for all initial ground disturbing activities.

- If any CRLF are observed in the Project work limits during construction, work will immediately stop, and the CRLF will be allowed to move out of harm's way on its own accord, and the Service will be contacted within 24 hours to reinitiate consultation.

BIO-10: Conservation Measures for Valley Elderberry Longhorn Beetle

- In conjunction with conservation measures previously listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to VELB as a result of the Project and those listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to VELB as a result of the Project:
- In addition to mitigation measure BIO-7, prior to initiating construction, highly visible fencing will be installed at the 20-foot setback around the perimeter of each elderberry plant or plant group. ESA fencing will consist of highly visible construction fencing or equivalent, and will be maintained until construction is complete. A qualified biologist will be present during the installation of fencing. If a minimum 20-foot setback from the dripline of all elderberry plants in the Action Area cannot be maintained for all project activities, the Service will be contacted and additional mitigation measures may be required
- Signs will be erected every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be clearly readable from a distance of 20 feet, and will be maintained for the duration of construction.
- In conjunction with avoidance and minimization measure BIO-6, an employee awareness training will be provided for the contractor the status of VELB, and emphasize the need to avoid impacting its habitat and host elderberry shrubs, and the possible penalties for not complying with these requirements.
- A qualified biologist will periodically inspect the construction area to assure that fencing and signs are intact and that the two elderberry shrubs adjacent to the proposed project are being avoided.
- No insecticides, fertilizers, or other chemicals that might harm the beetle or elderberry plants will be used within 100 feet of any elderberry plant with stems measuring greater than 1-inch in diameter. Herbicides may be used within 100 feet at the discretion of the permitting agencies. Any damage occurring within the elderberry buffer areas (within 100 foot of the elderberry plants) will be restored and revegetated with appropriate native species at the completion of construction.
- As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, should be conducted outside of the flight season of the VELB (March – July).

5.2.2 Compensation

Implementation of the conservation measures listed in **Section 5.2** would ensure that no adverse effects to special-status species would occur as a result of the Proposed Action. Therefore, no compensatory mitigation is proposed.

5.3 Effects of Interrelated and Interdependent Actions/Conclusions and Determination

The Proposed Action would not have interrelated or interdependent actions and therefore would not adversely affect federally-listed species within the Action Area or surrounding offsite areas.

5.4 Cumulative Effects

The FESA defines cumulative effects as those effects of future state, tribal, local, or private activities, which are reasonably certain to be conducted within the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. The cumulative setting for lone manzanita, CTS, CRLF, and VELB is the extent of its range, primarily within the Central Valley. Habitat removal from current and future development in the area is the biggest threat to these species. The Proposed Project would include replacing an existing bridge and would not contribute to development in the area or contribute to a cumulative loss in suitable habitat. Currently, there is no additional known state or private projects that are planned within the Action Area. Furthermore, no take of the species is anticipated and with the implementation of the avoidance and minimization measures the Proposed Project would avoid adverse effects on the species. Therefore, the Proposed Project is not expected to result in cumulatively considerable effects on lone manzanita, CTS, CRLF, and VELB.

5.5 Determination

5.5.1 Federally-listed Species

One federally-listed plant species has habitat suitable for its presence within the Action Area: lone manzanita (threatened). Based on the biological analysis of this species and the site survey, which found none present within the Action Area (**Chapters 3 and 4**), the Proposed Action may *affect*, but is *not likely to adversely affect* lone manzanita.

Five federally-listed animal species reviewed do not have habitat suitable for their presence within the Action Area: steelhead (Central Valley DPS), Delta smelt, vernal pool fairy shrimp, vernal pool tadpole shrimp, and giant garter snake. Therefore there is *no effect* to these species as a result of the Proposed Action. Three federally-listed animal species have CTS (threatened), CRLF (threatened), and VELB (Threatened), were determined to potentially occur in the Action Area based on availability of suitable habitat. Based on the site survey and biological analysis of this species (**Chapters 3 and 4**), and the conservation measures (**Chapter 5**), the Proposed Action may *affect*, but is *not likely to adversely affect* CTS (threatened), CRLF (threatened), and VELB (Threatened).

5.5.2 Critical Habitat

No designated critical habitat for any federally-listed species occurs within the Action Area.

5.5.3 Essential Fish Habitat (EFH)

An official NOAA Fisheries species list (NOAA, 2019b; **Appendix B-2**) requested by Caltrans, the federal lead agency, designates EFH for Chinook salmon within the Wallace, CA USGS quad. In addition, the EFH mapper indicates that the watershed that Bear Creek is within is considered EFH (NOAA, 2019a). Essential fish habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding,

feeding, or growth to maturity. While other waters within the Wallace CA USGS 7.5' Quadrangle may provide these elements, Bear Creek does not. Habitat for Chinook salmon is unavailable due to multiple fish barriers downstream of the BSA. Bear Creek does not provide suitable spawning, rearing, or foraging habitat for salmonids due to its intermittent nature and the lethal warm temperatures during the summer. In addition, habitat for Chinook salmon is unavailable due to multiple fish barriers downstream of the BSA. Based on this, the BSA does not contain EFH for Chinook salmon and therefore the Project would not adversely modify EFH.

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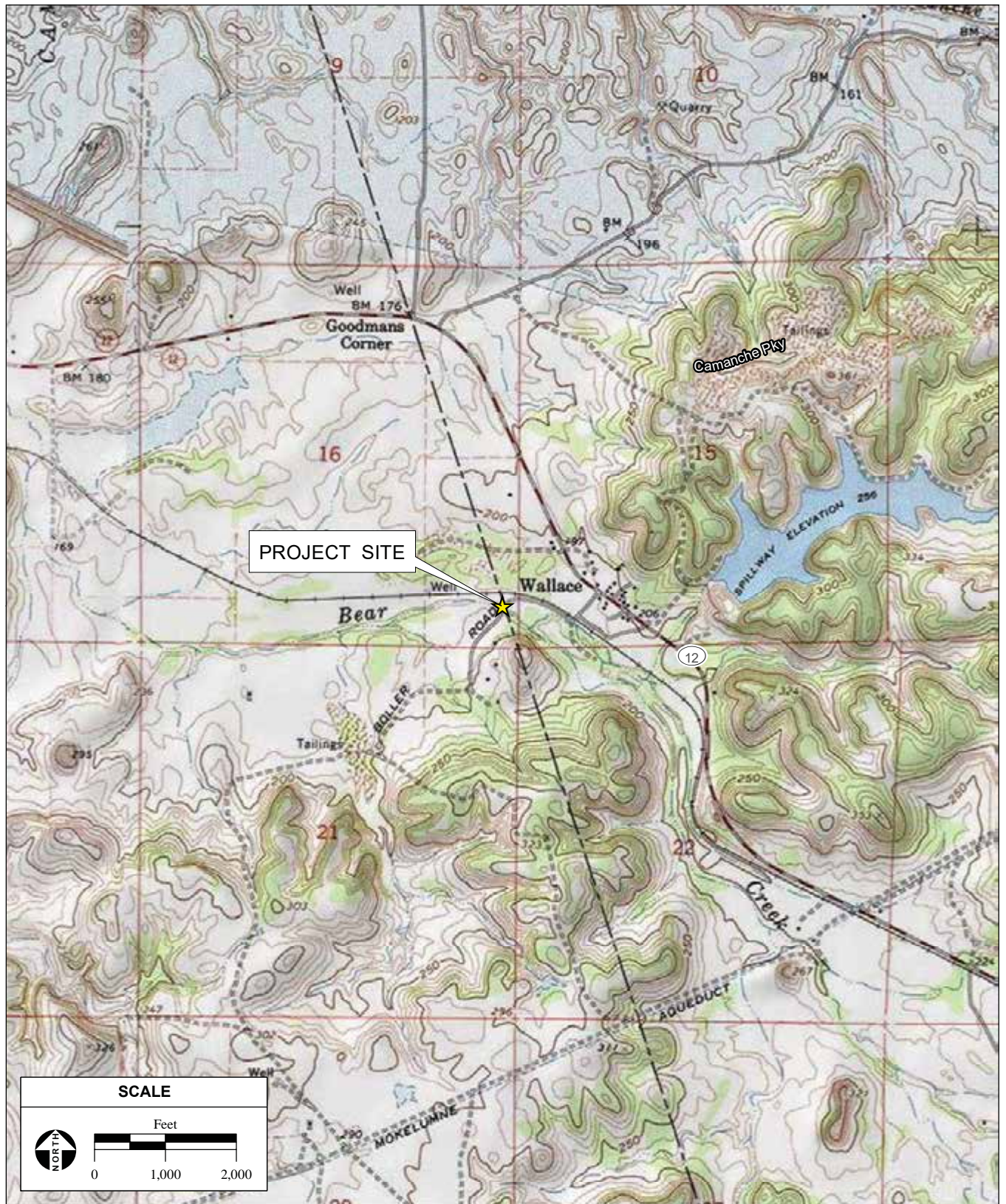
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APPENDICES

APPENDIX A

FIGURES, MAPS, AND PHOTOGRAPHS

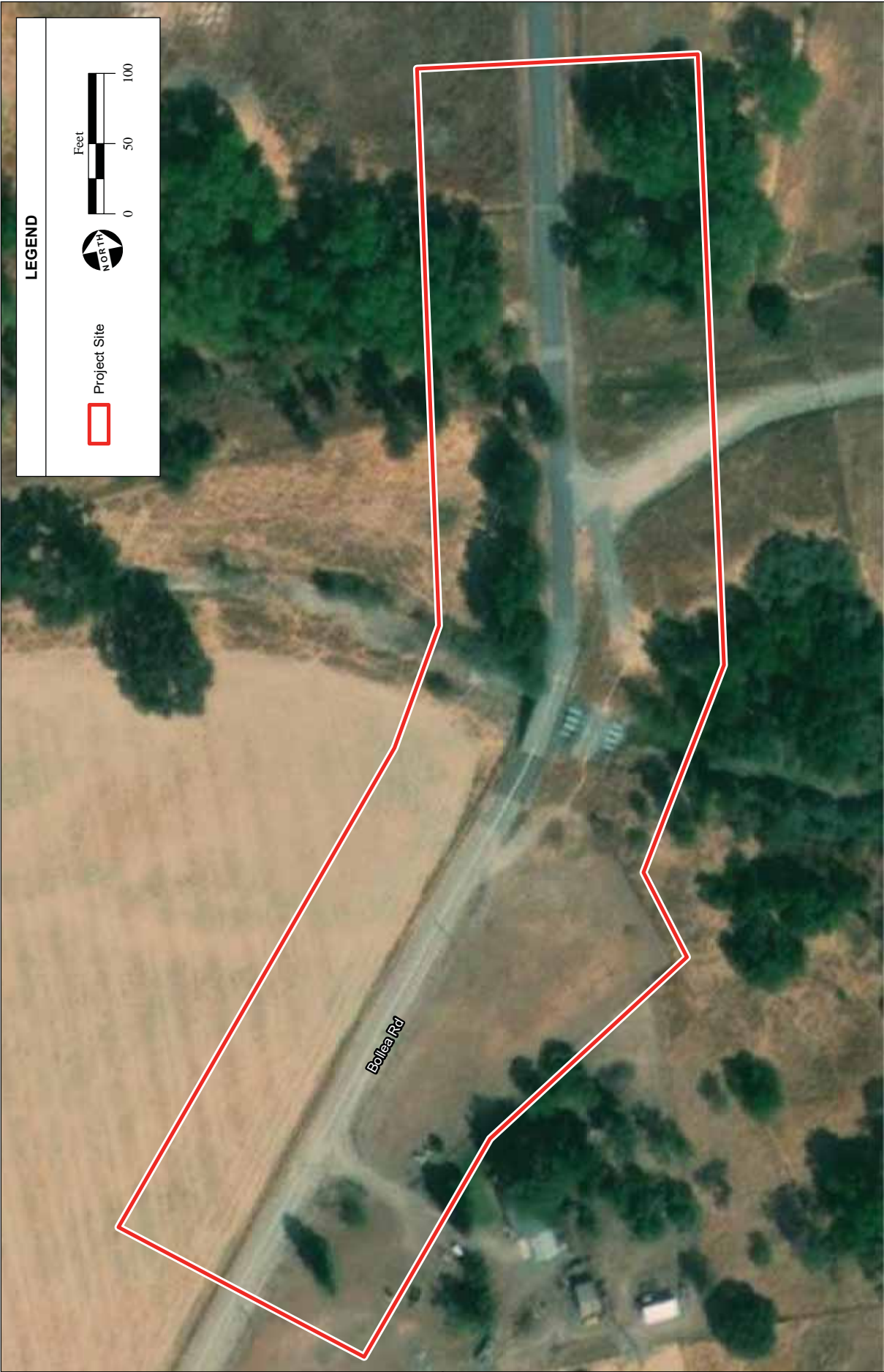


SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 10/10/2019

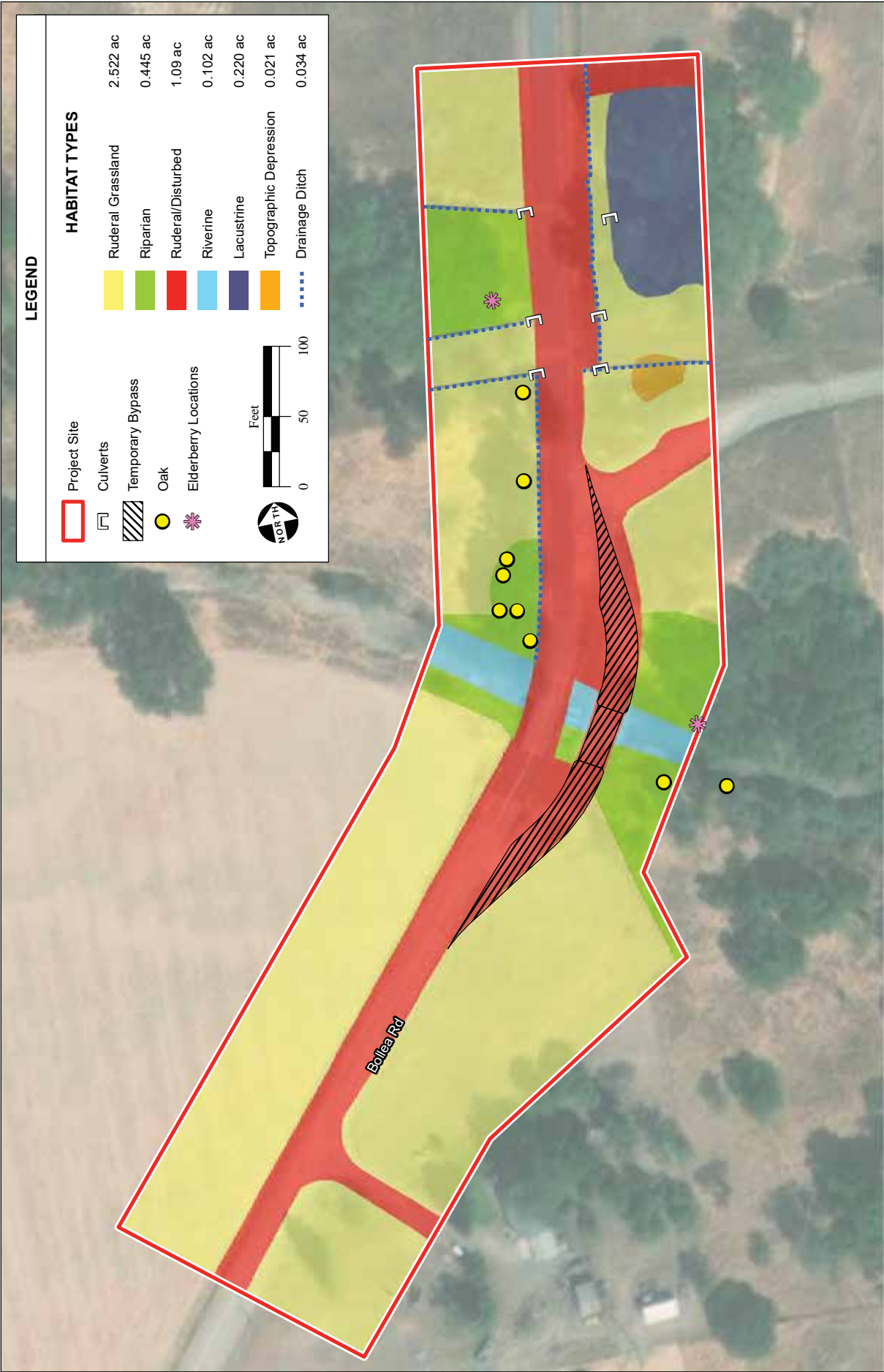
Bollea Road Bridge Replacement Project Biological Assessment / 215572 ■

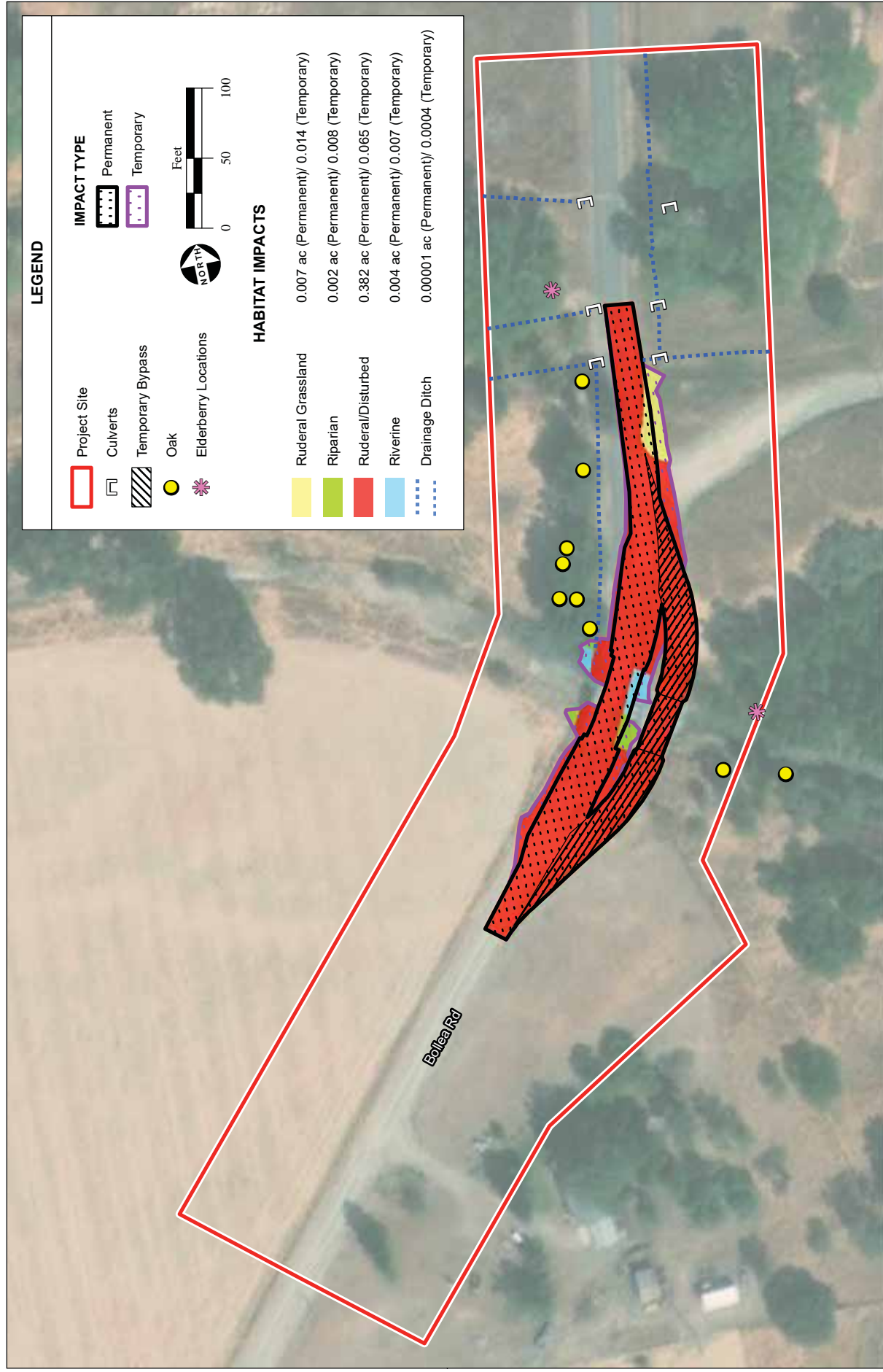
Appendix A - Figure 2

Project Location



SOURCE: DigitalGlobe aerial photograph, 6/23/2017; AES, 10/10/2019





SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 10/10/2019



PHOTO 1: Grassland – northeast corner of site.



PHOTO 4: Topographic Depression – north of existing bridge.



PHOTO 2: Riparian - upstream of existing bridge.



PHOTO 5: Ruderal/Disturbed – south of existing bridge.



PHOTO 3: Bear Creek – downstream of existing bridge.



PHOTO 6: Man-Made Pond – northeast corner of site.

APPENDIX B

SPECIAL-STATUS SPECIES LISTS

APPENDIX B-1

USFWS OFFICIAL SPECIES LIST



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

October 08, 2019

Consultation Code: 08ESMF00-2019-SLI-0611

Event Code: 08ESMF00-2020-E-00157

Project Name: Bollea Bridge Replacement Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0611

Event Code: 08ESMF00-2020-E-00157

Project Name: Bollea Bridge Replacement Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: AES Project #215572

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.19341314440841N120.98265893251681W>



Counties: San Joaquin, CA

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Ione Manzanita <i>Arctostaphylos myrtifolia</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1806	Threatened

Critical habitats

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

APPENDIX B-2

NOAA SPECIES LIST

From: [Porras, Samuel@DOT](mailto:Porras_Samuel@DOT)
To: nmfswoerca.specieslist@noaa.gov
Subject: 5929(236) Bollea Road Bridge - Caltrans (Federal Lead Agency) - NMFS Species List
Date: Wednesday, August 14, 2019 3:31:00 PM

Good Afternoon,

I am requesting an official FESA species list for the Wallace quadrangle listed below. Caltrans is the federal lead agency, as designated by FHWA. San Joaquin County is the project proponent (nonfederal lead agency).

Federal Lead Agency:

Samuel Porras
California Department of Transportation
1976 E. Dr. Martin Luther King Jr. Blvd
Stockton, CA 95205
Email: Samuel.Porras@dot.ca.gov
Office Phone: (209) 948-3667

Environmental Consultant (Point of Contact for San Joaquin County):

Nicholas Bonzey
Analytical Environmental Services (AES)
1801 7th Street, Suite 100
Sacramento, CA 95811
Office Phone: (916) 447-3479

Quad Name **Wallace**

Quad Number **38120-B8**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

**See list at left and consult the NMFS Long Beach office
562-980-4000**

MMPA Cetaceans -

MMPA Pinnipeds -

Thank you,

Samuel Porras

Associate Environmental Planner (Biologist)

California Department of Transportation – District 10

Division of Planning, Local Assistance & Environmental

Office: (209) 948-3667

APPENDIX C

LIST OF VASCULAR PLANTS OBSERVED

Table 1. List of Vascular Plant Species Observed at Bollea Road Bridge Replacement Project on March 8, and July 20, 2017. Wetland Indicator Status were classified according to the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016).

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Achillea millefolium</i>	yarrow	Asteraceae	native	annual herb	FACU
<i>Achyrochaena mollis</i>	blow wives	Asteraceae	native	annual herb	FAC
<i>Acmispon glaber</i>	deerweed	Fabaceae	native	perennial herb	UPL
<i>Agrostis stolonifera</i>	redtop	Poaceae	non-native	perennial grass	FACW
<i>Amsinckia menziesii</i>	common fiddleneck	Boraginaceae	native	annual herb	UPL
<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	native	perennial herb	FAC
<i>Avena barbata</i>	slender wild oat	Poaceae	non-native	annual grass	UPL
<i>Avena fatua</i>	wild oats	Poaceae	non-native	annual grass	UPL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	native	shrub	UPL
<i>Baccharis salicifolia</i>	mulefat	Asteraceae	native	shrub	FAC
<i>Briza minor</i>	little rattlesnake grass	Poaceae	non-native	annual grass	FAC
<i>Bromus diandrus</i>	ripgut brome	Poaceae	non-native	annual grass	UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	non-native	annual grass	FACU
<i>Bromus madritensis ssp. madritensis</i>	foxtail chess	Poaceae	non-native	annual grass	UPL
<i>Calandrinia menziesii</i>	red maids	Montiaceae	native	annual herb	UPL
<i>Cardamine oligosperma</i>	bitter cress	Brassicaceae	native	annual/perennial herb	FAC
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	non-native	annual herb	UPL
<i>Carex nudata</i>	torrent sedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Ceanothus cuneatus</i>	buckbrush	Rhamnaceae	native	perennial shrub	UPL
<i>Clarkia sp.</i>	clarkia	Onagraceae	native	annual herb	UPL
<i>Claytonia perfoliata</i>	miner's lettuce	Montiaceae	native	annual herb	FAC
<i>Croton setiger</i>	turkey-mullein	Euphorbiaceae	native	perennial herb	UPL
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Dactylis glomerata</i>	orchard grass	Poaceae	non-native	perennial grass	FACU
<i>Dichelostemma capitatum</i>	wild hyacinth	Themidaceae	native	perennial herb	FACU
<i>Diplacus aurantiacus</i>	Sticky monkeyflower	Phrymaceae	native	shrub	FACU
<i>Elymus glaucus</i>	blue wildrye	Poaceae	native	perennial herb	FACU

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Epilobium ciliatum</i>	slender willow herb	Onagraceae	native	perennial herb	FACW
<i>Epilobium densiflorum</i>	willow herb	Onagraceae	native	annual herb	FACW
<i>Erigeron canadensis</i>	Canada horseweed	Asteraceae	native	annual herb	FACU
<i>Eriodictyon californicum</i>	yerba santa	Boraginaceae	native	shrub	FACU
<i>Erodium botrys</i>	big heron bill	Geraniaceae	non-native	annual herb	FACU
<i>Erodium cicutarium</i>	red-stemmed filaree	Geraniaceae	non-native	annual herb	UPL
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	native	annual/perennial herb	UPL
<i>Festuca microstachys</i>	small fescue	Poaceae	native	annual grass	UPL
<i>Festuca perennis (Lolium perenne)</i>	rye grass	Poaceae	non-native	annual/perennial herb	FAC
<i>Frangula californica ssp. tomentella</i>	hoary coffeeberry	Rhamnaceae	native	shrub	UPL
<i>Galium aparine</i>	cleavers	Rubiaceae	native	annual herb	FACU
<i>Gaspidium phleoides</i>	nit grass	Poaceae	non-native	annual grass	FACU
<i>Geranium dissectum</i>	wild geranium	Geraniaceae	non-native	annual herb	UPL
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	native	annual/perennial herb	FAC
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae	native	shrub	UPL
<i>Hirschfeldia incana</i>	short-podded mustard	Brassicaceae	native	perennial herb	UPL
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	native	perennial grass	FACW
<i>Hordeum marinum</i>	barley	Poaceae	non-native	annual grass	FAC
<i>Hypericum concinnum</i>	gold wire	Hypericaceae	native	perennial herb	UPL
<i>Hypochaeris glabra</i>	smooth cats ear	Asteraceae	non-native	annual herb	UPL
<i>Hypochaeris radicata</i>	hairy cats ear	Asteraceae	non-native	annual herb	FACU
<i>Juglans hindsii</i>	northern California black walnut	Juglandaceae	native	tree	FAC
<i>Juncus acuminatus</i>	tapered rush	Juncaceae	native	perennial herb	OBL
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	non-native	annual herb	FACU
<i>Lathyrus jepsonii</i>	Jepson's pea	Fabaceae	native	annual herb	OBL
<i>Leontodon saxatilis</i>	hawkbit	Asteraceae	non-native	annual herb	FACU
<i>Logfia filaginoides</i>	California cottonrose	Asteraceae	native	annual herb	UPL
<i>Logfia gallica</i>	narrowleaf cottonrose	Asteraceae	non-native	annual herb	UPL
<i>Lonicera interrupta</i>	chaparral honeysuckle	Caprifoliaceae	native	vine/shrub	UPL
<i>Lupinus bicolor</i>	lupine	Fabaceae	native	annual/perennial herb	UPL

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	non-native	annual herb	FAC
<i>Madia exigua</i>	small tarweed	Asteraceae	native	annual herb	UPL
<i>Marah fabacea</i>	California man-root	Cucurbitaceae	native	perennial herb/vine	UPL
<i>Marrubium vulgare</i>	horehound	Lamiaceae	non-native	Perennial herb	FACU
<i>Medicago polymorpha</i>	burclover	Fabaceae	non-native	annual herb	FACU
<i>Melilotus indicus</i>	annual yellow clover	Fabaceae	non-native	annual herb	FACU
<i>Microseris douglasii</i>	Douglas' microseris	Asteraceae	native	annual herb	FACU
<i>Minuartia douglasii</i>	Douglas' sandwort	Caryophyllaceae	native	annual herb	FACU
<i>Pellaea andromedifolia</i>	coffee fern	Pteridaceae	native	perennial	UPL
<i>Pentagramma triangularis</i>	gold back fern	Pteridaceae	native	perennial	UPL
<i>Phyla nodiflora</i>	common lippia	Verbenaceae	native	perennial herb	FACW
<i>Pinus sabiniana</i>	foothill pine	Pinaceae	native	tree	UPL
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	non-native	perennial herb	FAC
<i>Plectritis macrocera</i>	plecritis	Valerianaceae	native	annual herb	FACU
<i>Poa secunda</i>	one-sided blue grass	Poaceae	native	perennial grass	FACU
<i>Quercus lobata</i>	valley oak	Fagaceae	native	tree	FACU
<i>Quercus wislizeni</i>	blue oak	Fagaceae	native	tree	UPL
<i>Ranunculus californicus</i>	buttercup	Ranunculaceae	native	perennial herb	FACU
<i>Rubus ursinus</i>	California black-berry	Rosaceae	native	perennial vine	FAC
<i>Salix laevigata</i>	red willow	Salicaceae	native	tree	FACW
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	native	tree	FACW
<i>Salix exigua</i>	sandbarwillow	Salicaceae	native	tree or shrub	FACW
<i>Sambucus nigra ssp. caerulea</i>	elderberry	Adoxaceae	native	shrub	FACU
<i>Silene gallica</i>	common catchfly	Caryophyllaceae	non-native	annual herb	UPL
<i>Silybum marianum</i>	milk thistle	Asteraceae	non-native	annual/perennial herb	UPL
<i>Sonchus asper</i>	prickly sow thistle	Asteraceae	non-native	annual herb	FAC
<i>Sonchus oleraceus</i>	sow thistle	Asteraceae	non-native	annual herb	UPL
<i>Spergularia rubra</i>	purple sand spurry	Caryophyllaceae	non-native	annual/perennial herb	FAC
<i>Stachys ajugoides</i>	ajuga hedge nettel	Lamiaceae	native	perennial herb	OBL

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Stellaria media</i>	chickweed	Caryophyllaceae	non-native	annual herb	FACU
<i>Symphoricarpos mollis</i>	creeping snowberry	Caprifoliaceae	native	shrub	FACU
<i>Toxicodendron diversilobum</i>	poison oak	Anacardiaceae	native	perennial vine/shrub	FACU
<i>Trifolium sp.</i>	clover	Fabaceae	N/A	annual herb	N/A
<i>Typha sp.</i>	cat tail	Typhaceae	native	perennial herb (aquatic)	OBL
<i>Urtica dioica</i>	stinging nettle	urticaceae	native	perennial herb	FAC
<i>Verbascum blattaria</i>	moth mullein	Scrophulariaceae	non-native	perennial herb	UPL
<i>Veronica anagallis-aquatica</i>	water speedwell	Plantaginaceae	non-native	perennial herb	OBL
<i>Vicia villosa</i>	vetch	fabaceae	non-native	annual herb/vine	UPL
<i>Xanthium strumarium</i>	rough cocklebur	Asteraceae	native	annual herb	FAC

APPENDIX B

DELINEATION OF WATERS OF THE U.S.



DELINEATION OF WATERS OF THE U.S.
SAN JOAQUIN COUNTY
BOLLEA ROAD BRIDGE REPLACEMENT PROJECT

JUNE 2017

LEAD AGENCY:

San Joaquin County
1810 East Hazelton Avenue
Stockton, CA 95205



PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com



DELINEATION OF WATERS OF THE U.S.

SAN JOAQUIN COUNTY

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NOTE: The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.

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Appendix C	USACE Wetland Determination Forms
Appendix D	USACE Aquatic Resources Sheet
Appendix E	Natural Resources Conservation Services Soil Survey

LIST OF ABBREVIATED TERMS

APN	Assessor Parcel Number
CA-12	State Route 12
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CWA	Clean Water Act
Delta	San Francisco Bay Delta
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OHWM	ordinary high water mark
RPW	relatively permanent water
RWQCB	regional water quality control board
SWANCC	Solid Waste Agency of Northern Cook County
SWPPP	Stormwater Pollution Prevention Plan
TNW	traditional navigable water
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
°F	degrees Fahrenheit

1.0 INTRODUCTION

A delineation of potential wetlands and other Waters of the U.S. was conducted for the approximately 4.434-acre study area located along Bollea Road at the San Joaquin and Calaveras County, California intersection (study area) on March 8, 2017. This delineation report describes potentially jurisdictional Waters of the U.S. identified within the study area that may be subject to regulation by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA). The boundaries of Waters of the U.S. depicted in this report represent a calculated estimate of the potentially jurisdictional features within the study area and are subject to modification following the USACE verification process. All results are considered preliminary until the USACE verifies the findings.

1.1 Project Applicant and Agent

Applicant	Agent
County of San Joaquin Department of Public Works 1810 E. Hazelton Avenue Stockton, CA 95201 Phone: (209) 468-3000	Analytical Environmental Services 1801 7th Street, Suite 100 Sacramento, CA 95811 Phone: (916) 447-3479 Fax: (916) 447-1665

1.2 Project Location

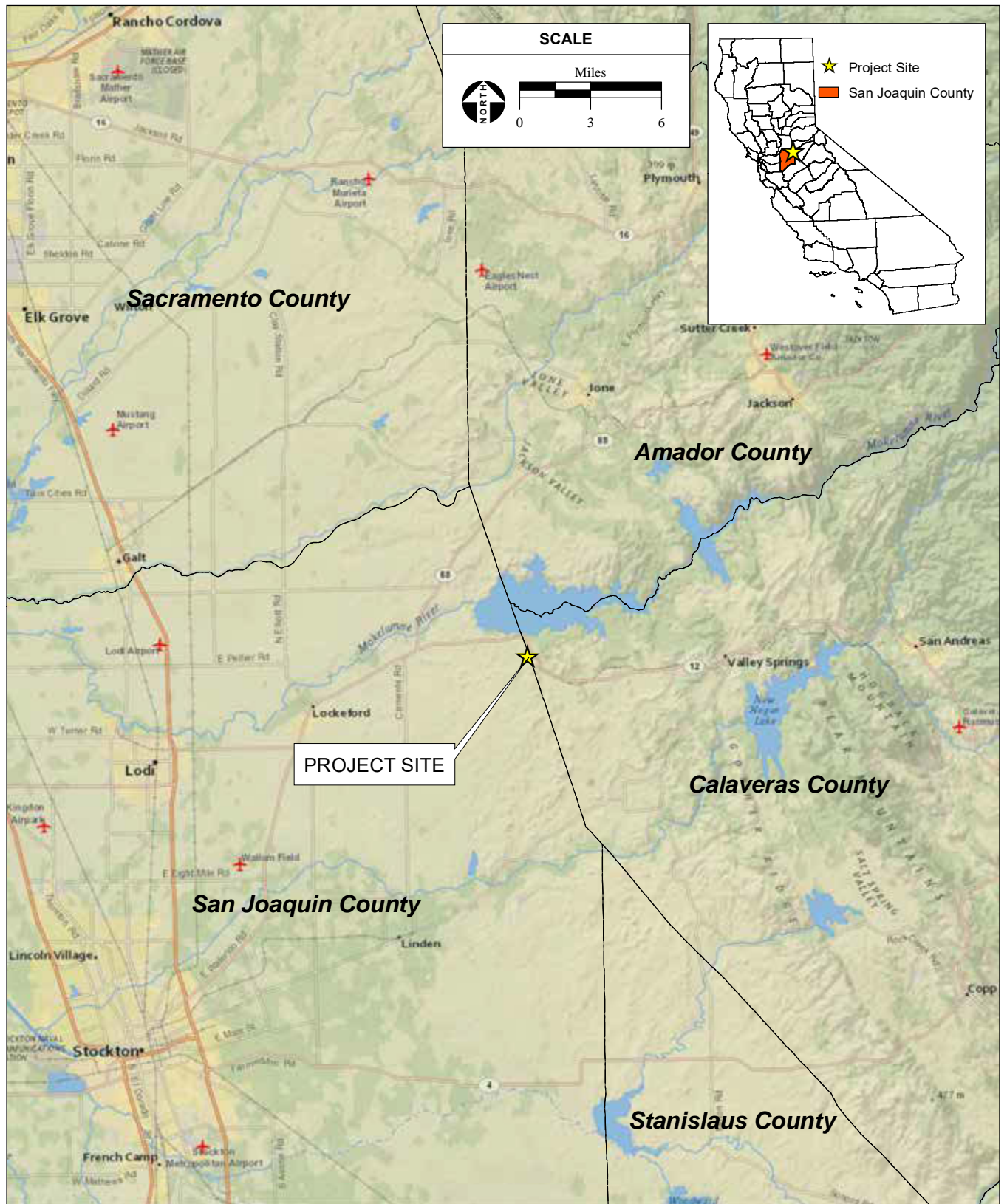
The study area is approximately 4.434 acres and encompasses parts of neighboring parcels of land (Assessor's Parcel Number (APN): 02322011 and 02322012 in San Joaquin County, 48018145 and 48019045 in Calaveras County) and the California Department of Transportation (Caltrans) right-of-way within or adjacent to those parcels. The study area is located along Bollea Road, at the border of San Joaquin and Calaveras County, and is centered roughly at latitude 38° 11' 36.20" N, longitude 120° 58' 57.28" W (**Figure 1**). The study area occurs within Section 16, Township 4 North, Range 9 East, Mount Diablo Baseline and Meridian, on the "Wallace, California" U.S. Geological Survey (USGS) 7.5-minute quadrangle map (USGS, 1965; **Figure 2**). An aerial photograph that illustrates the study area, project footprint and area of potential effects is shown in **Figure 3**.

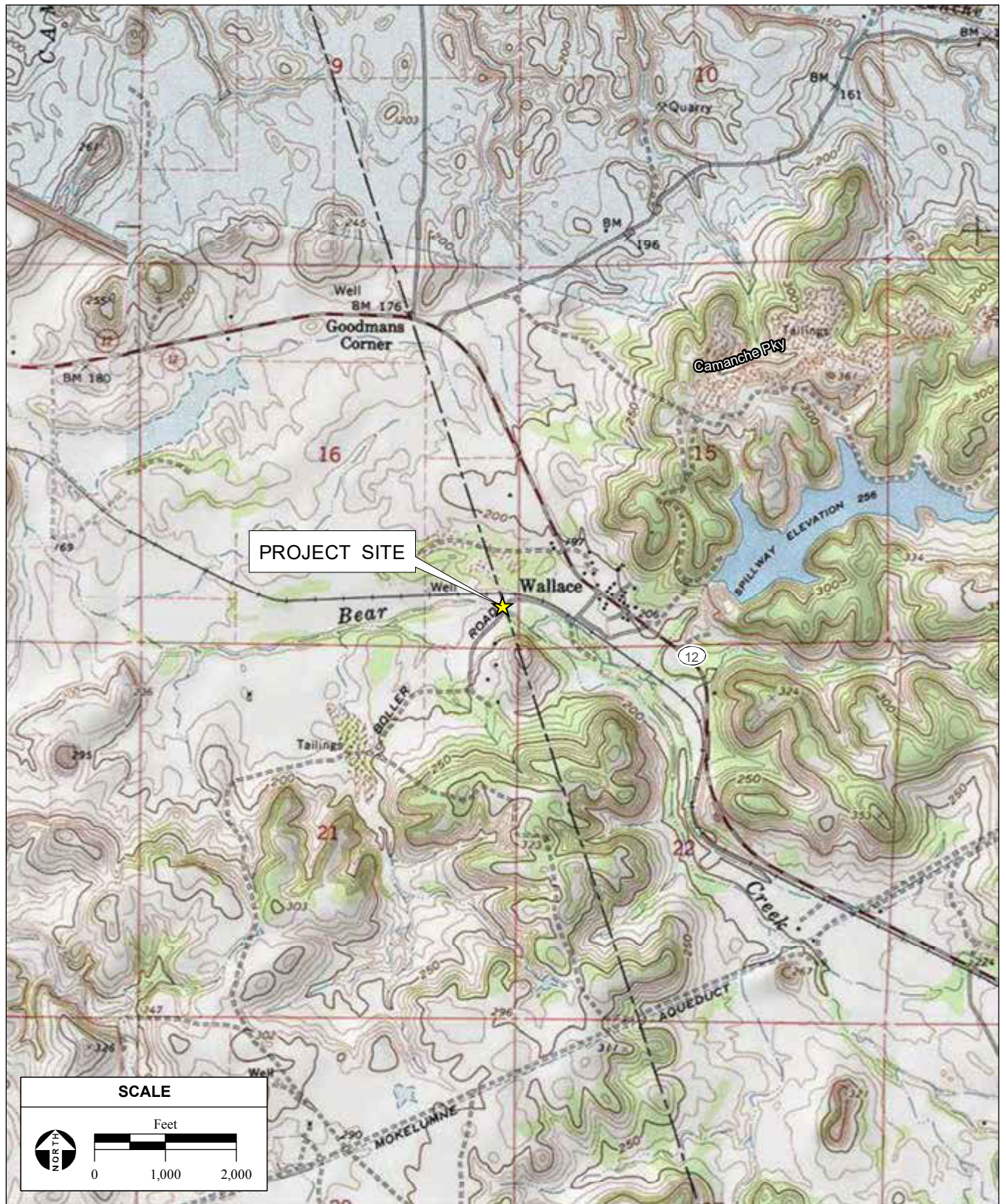
1.3 Driving Directions

From Lodi, CA take State Route 12 (CA-12) for 39.3 miles east to Bollea Road. Turn right on Bollea Road and drive west for 0.3 miles.

2.0 REGULATORY SETTING

The USACE has primary federal responsibility for administering regulations that concern Waters of the U.S., including wetlands, under CWA Section 404. Section 404 regulates the discharge of dredged and fill material into Waters of the U.S. The USACE requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into

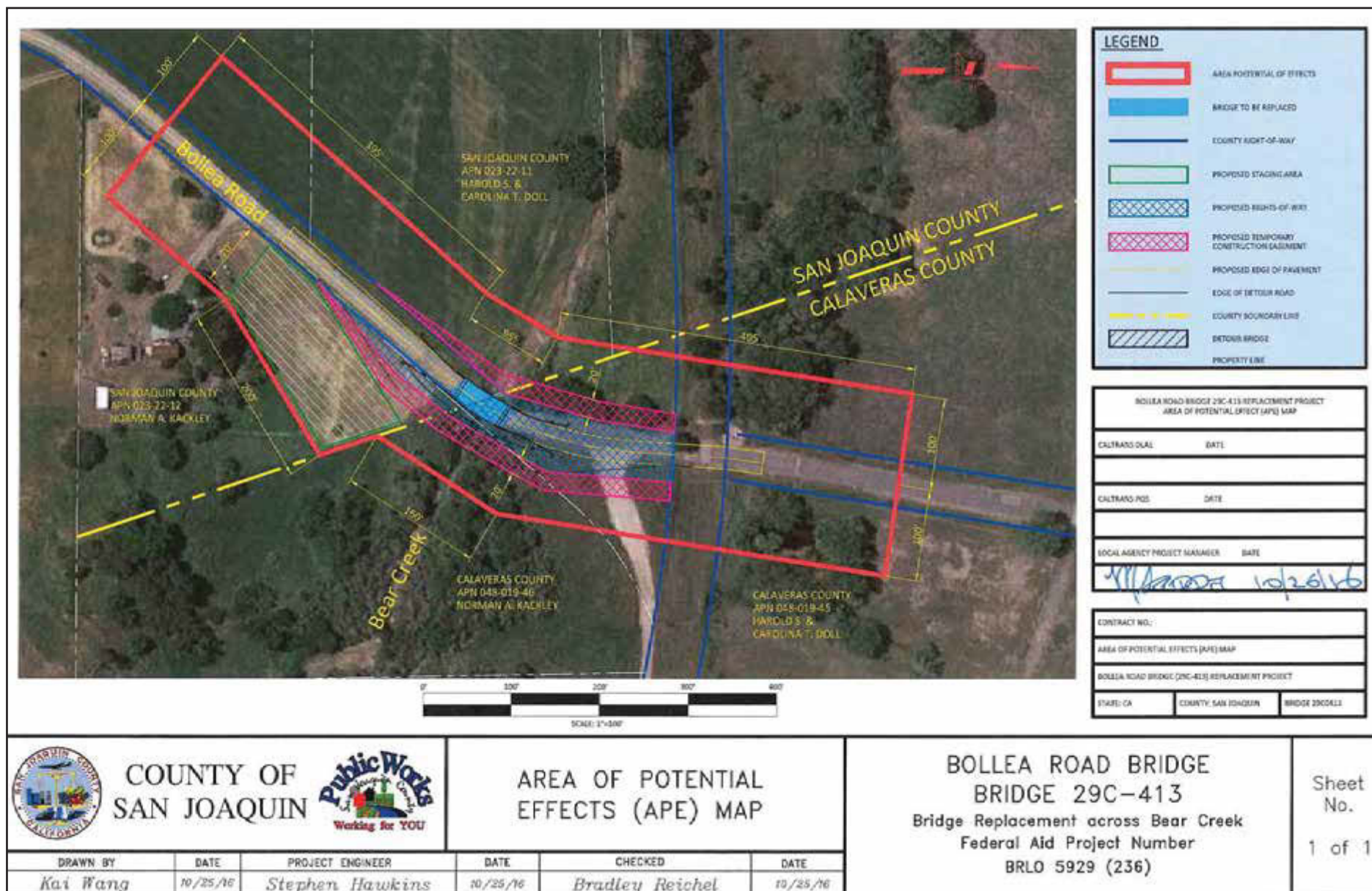




SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 10/27/2017

Bollea Bridge Preliminary Wetland Report / 215572 ■

Figure 2
Site and Vicinity



SOURCE: San Joaquin County Public Works, 10/25/2016; AES, 3/16/2017

Bollea Bridge Preliminary Wetland Report / 215572 ■

Figure 3
Aerial Site Map

Waters below the ordinary high water mark (OHWM). The USACE has established a series of nationwide permits (NWP) that authorize certain activities in Waters of the U.S. Wetlands and other water features that lack a hydrologic connection to navigable Waters of the U.S. and that lack a nexus to interstate and foreign commerce are not regulated by the CWA and do not fall under the jurisdiction of the USACE; such features are called “isolated.”

In addition, a Section 401 Water Quality Certification process was established to comply with CWA Sections 301, 302, 303, 306 and 307 and is typically regulated by the applicable Regional Water Quality Control Board (RWQCB) under delegated authority from the U.S. Environmental Protection Agency (EPA). Any applicant proposing to conduct a project that may result in a discharge to U.S. surface waters and/or “Waters of the State,” including wetlands (all types), year-round and seasonal streams, lakes, and all other surface waters, would require a federal permit or water quality certification. At a minimum, any beneficial uses lost must be replaced through a mitigation project of at least equal function, value, and area.

Waters of the U.S. are defined as follows (CWA Section 404; 33 Code of Federal Regulations [CFR] Part 328):

All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters..

The limit of USACE jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as follows (CWA Section 404; 33 CFR Part 328):

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 areas.

Wetlands are defined as follows (CWA Section 404; 33 CFR Part 328):

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The USACE and EPA issued the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* on May 30, 2007, to provide guidance based on the U.S. Supreme Court’s decision regarding *Rapanos v. United States* and *Carabell v. United States* (Rapanos decision) [*Rapanos vs. U.S.*, No. 04-1034 (June 19, 2006) and *Carabell vs. U.S.*, No. 04-1384 (September 27, 2004)]; USACE

and EPA, 2007]. The decision provides standards that distinguish between traditional navigable waters (TNWs), relatively permanent waters (RPWs) with perennial or seasonal flows, and non-relatively permanent waters (non-RPWs). Wetlands and non-TNWs adjacent to TNWs are subject to CWA jurisdiction if: (a) the water body is relatively permanent; (b) a water body abuts or is tributary to an RPW; or (c) a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. The significant nexus standard is based on evidence applicable to ecology, hydrology, and the influence of the water on the “chemical, physical, and biological integrity of downstream traditional navigable waters” (USACE, 2008a). Isolated wetlands are not subject to CWA jurisdiction based on the U.S. Supreme Court’s decision regarding the Solid Waste Agency of Northern Cook County (SWANCC decision) [*Solid Waste Agency of Northern Cook County vs. U.S. Army Corps of Engineers*, No. 99-1178, January 9, 2001; U.S. Department of Energy, 2003].

In addition, ditches (including roadside ditches) that are excavated wholly within and drain only uplands and that do not carry a relatively permanent flow of water are generally not considered Waters of the U.S. because they are not tributaries to or have a significant nexus to downstream TNWs (45, 48, and 51 Federal Register Subsections 62732, 62747, 21466, 21474, 41206, and 41217). The December 2008 memorandum summarizing key points of the Rapanos Guidance also states that agencies generally will not assert jurisdiction over ditches (including roadside ditches) that are excavated wholly within and drain only uplands and that do not carry a relatively permanent flow of water (USACE and EPA, 2007).

USACE Regulatory Guidance Letter 07-01 (RGL 07-1), *Practices for Documenting Jurisdiction Under Section 9 & 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA* (USACE, 2007), states that upland swales and erosional features (e.g., gullies, small washes characterized by low-volume, infrequent, and short-duration flow) are generally not Waters of the U.S. because they are not tributaries to or have a significant nexus to downstream TNWs.

3.0 METHODOLOGY

The information presented in this report was prepared in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE, 2008a); *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE, 2016); and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The boundaries of potential Waters of the U.S. were delineated through standard field methodologies (i.e., paired data set analyses), and all wetland data were recorded on USACE Wetland Determination Forms - Arid West Region (**Appendix C**), and Aquatics Resources Excel worksheets (**Appendix D**). A color aerial photograph was used in the field to assist with the delineation. The *Munsell Soil Color Charts* (Kollmorgen Instruments Co., 1990) were used in the field to identify hydric soils. Plant identification and nomenclature followed *The Jepson Manual: Higher Plants of California* (Hickman, 1993) and the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016). Site photographs of the study area are included as **Appendix A**.

3.1 Delineation

On March 8, 2017, AES biologists Nicholas Bonzey and David Moldoff conducted a delineation of the study area. He walked transects throughout the study area to determine the location of potential Waters of the U.S. Because all potential Waters of the U.S. could be delineated based on OHWM, no paired sample points for wetland determination were collected. The Waters delineated by OHWM followed criteria outlined in the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE, 2008b). Positional data was collected using a global positioning systems (GPS) handheld unit (Trimble GeoXH™) with sub-meter accuracy.

3.2 Routine Determinations

Potential wetlands located within the study area were evaluated based on the following three parameter criteria:

- The majority of dominant plant species are wetland-associated species;
- Hydric soils are present; and
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

Other Waters of the U.S. were evaluated based on OHWM characteristics.

3.3 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce soils that are permanently or periodically saturated for sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987). Prevalent vegetation is characterized by the dominant plant species comprising the plant community. The dominance test is the basic hydrophytic vegetation indicator and was utilized at each data point location. The “50/20 rule” was used to select the dominant plant species from each stratum of the vegetation community. This rule states that for each stratum in the community, dominant plant species are the most abundant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional plant species that individually comprise 20 percent or more of the total stratum (USACE, 2008a).

3.4 Soils

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil (Natural Resources Conservation Service [NRCS], 2010). Frequently observed indicators of hydric soils include (but are not limited to) histosols, histic epipedon, hydrogen sulfide, stratified layers, depleted below dark surface, depleted matrix, redox dark surface, depleted dark surface, and redox depressions (USACE, 2008a).

3.5 Hydrology

Wetlands are generally depressions in the landscape that are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include (but are not limited to) visual observation of surface water, high water table, saturation, water marks (non-riverine), sediment deposits (non-riverine), drift deposits (non-riverine), surface soil cracks, inundation visible on aerial imagery, water-stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, and oxidized rhizospheres along living roots. Secondary indicators of wetland hydrology include water marks (riverine), sediment deposits (riverine), drainage patterns, dry-season water table, and crayfish burrows (USACE, 2008a). Observation of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology for each feature.

4.0 ENVIRONMENTAL SETTING

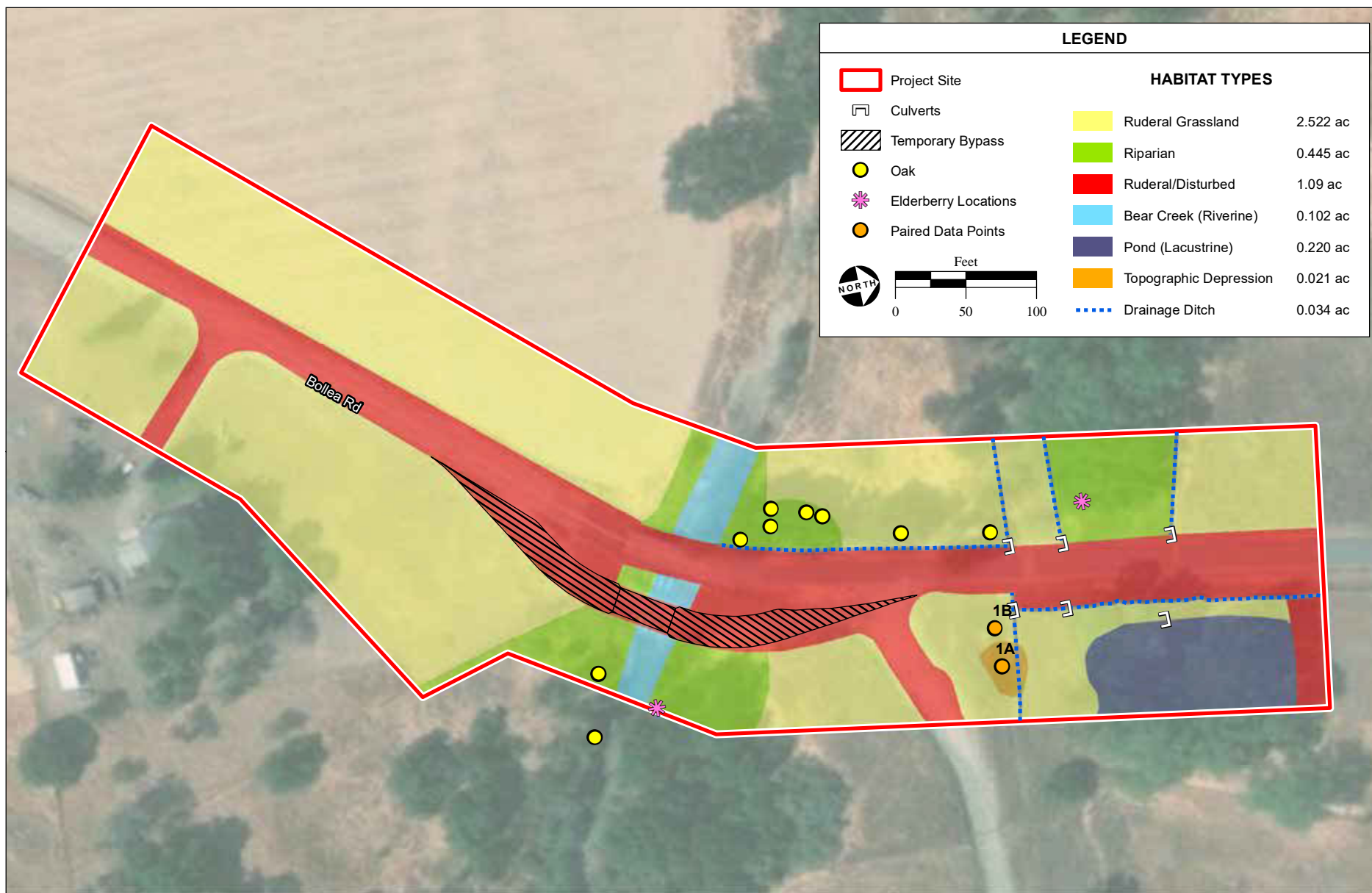
The study area is located on the border of San Joaquin County and Calaveras County within the northern terraces of the Central California Valley. This area has a semi-arid Mediterranean climate regime characterized by hot, dry, sunny summers and cool, rainy winters. Summers are hot and dry with little to no rain, and winters are characterized by foggy days and cooler temperatures. The mean annual temperature range in San Joaquin County is approximately 46 to 75 degrees Fahrenheit (°F). The average annual precipitation range in San Joaquin County is approximately 0 to 3.5 inches, with the maximum usually occurring during the month of January. This climate data was collected from 1980-2010 (The Weather Channel, 2017).

The study area is set among gently rolling terrain and is situated at elevations that range from approximately 180 to 266 feet (55 to 81 meters) above mean sea level. Bear Creek, a tributary to the San Francisco Bay Delta (Delta), flows westward through the study area. Bear Creek enters the Delta via White Slough on the north end of the City of Stockton. The study area falls within Climate Zone 12 (PG&E, 2017). Climate Zone 12 experiences cool winters and hot summers with winter rains typically occur from November to April, and high summer temperatures reaching over 100°F.

The study area is situated in a rural residential/agricultural setting west of the community of Wallace, CA. Surrounding land uses include rural residential, agriculture, and undeveloped open land. The study area is predominantly undeveloped and uncultivated. Several residences and associated structures are located within the study area and include: an agricultural field, a residential development, a dirt roadway, and a disturbed area with a man-made pond.

4.1 Habitat Types

The study area contains a variety of terrestrial and aquatic habitat types. These habitats include: grassland, riparian, ruderal/disturbed, intermittent stream, pond, and a topographic depression. A map that illustrates the terrestrial and aquatic habitat types within the study area is presented as **Figure 4**. Also represented on **Figure 4** are oak trees with a diameter at breast height (dbh) greater than or equal to 5 inches. A complete list of vascular plant species observed within the study area can be found in **Appendix B**. The habitat types are discussed further below.



Grassland

The non-native annual grassland plant community is found in several locations north of the existing bridge. The biological survey occurred outside of the primary blooming period for grassland species. As a result, identification of grassland species was not definitive. However, species typical of this habitat type in this region include *Amsinckia* spp. (e.g., *menziesii*, *tessellata*), *Bromus* spp. (e.g., *hordeaceus*, *diandrus*), *Brachypodium distachyon*, *Lasthenia californica*, *Plantago erecta*, *Festuca microstachys*, *Lotus purshianus*, *Nassella cernua*, and *Plagiobothrys nothofulvus*. No animals were observed within this habitat.

Riparian

Riparian habitat along either side of Bear Creek consists predominately of densely clumped oaks (*Quercus* spp.). A separate span of riparian habitat occurs in the northwestern portion of the site. This riparian habitat is dominated by willows (*Salix* spp.), oaks, and bare ground. Several species of migratory birds were observed in this habitat during the site survey.

Ruderal/Disturbed

Roadside ditches are present throughout the site and connect to those running along either side of Bollea Road. The western ditch along Bollea Road, connects to Bear Creek above the OHWM and is covered in dense vegetation. Northeast of the existing bridge there is a private property that contains a man-made pond and an area of bare ground. A dirt road is also present to the east and connects a private residence to Bollea Road. South of the existing bridge is a row crop field to the west and a residential house and yard to the east. Lastly, at the time of the survey, ongoing construction of a temporary vehicular bypass, approximately 15 feet upstream of the existing bridge, was occurring.

Bear Creek (Riverine)

Bear Creek, a USGS blue-line intermittent stream, passes through the site and flows generally from east to west. A USGS blue-line stream is a water course identified by the USGS as being potentially jurisdictional and must be investigated during preliminary environmental studies. The ordinary high water mark of the stream was delineated based on a drastic change in terrestrial vegetation, sorted coarse substrate, and undercut banks, all indicators of the regular presence of moving water within a riverine system. Within the stream channel, the bed consisted of silt and sand with dispersed cobble. Terrestrial vegetation was absent from the channel except for small amounts of algal mats downstream of the bridge. Aerial imagery and aquatic invertebrates were used to classify the stream as intermittent as water was present within the stream channel during the March 8, 2017 site visit. No fish or other aquatic animals were observed within the habitat.

Pond (Lacustrine)

Approximately 0.220 acres of a man-made pond located on private property is situated on the northeastern portion of the site. The entire pond was fenced and not accessible during the survey. It has raised berms on all sides with overflow culverts that spill into the roadside ditches. Vegetation is dominated by large willows (*Salix* spp.) and a clear OHWM was observed.

Topographic Depression

An approximately 0.021 acre topographic depression, with obvious wetland vegetation, was evaluated for the three parameters required to be considered a wetland (USACE, 2008a). Herbaceous vegetation within the topographic depression passed the dominance test and therefore are considered hydrophytic vegetation (**Appendix C**). A paired data point set was established to evaluate whether the three parameter criteria supported a wetland or upland determination. One point was situated outside the limits of the hydrophytic vegetation and the other point was situated within the hydrophytic vegetation (**Figure 4**). Although the herbaceous vegetation within the topographic depression was determined to meet the criteria as hydrophytic, and wetland hydrology is present (observable surface water), an investigation of the soils revealed that it did not meet any of the hydric soil indicators for the Arid West Region (USACE, 2008a) and therefore is not considered jurisdictional by the USACE. The Wetland Determination Forms for the paired sample points are provided in **Appendix C**.

4.2 Soil Types

According to the NRCS online *Soil Survey of San Joaquin County, California and Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties* (NRCS, 2017), there are three identified soil types mapped within the study area: Acampo sandy loam, 0 to 2 percent slopes; Dumps, tailings, and Pentz sandy loam, 2 to 15 percent slopes. The Acampo and Pentz series contain minor components that are considered hydric. A full NRCS soils report can be found in **Appendix E**.

Acampo sandy loam, 0 to 2 percent slope

The Acampo sandy loam occurs on approximately 70 percent of the study area. This is a moderately, well-drained soil derived from granite. Acampo soils are found in the fan terraces and are considered prime farmland if irrigated.

Dumps, tailings

The dumps and tailings designation is found in 17 percent of the study area. These areas occur throughout the State and most are outwash terraces. Many of the dumps are adjacent to streams and range from 3 to 40 acres.

Pentz sandy loam, 2 to 15 percent slope

The Pentz sandy loam occurs on approximately 13 percent of the study area. This is a well-drained soil formed from weathered basic andesitic, tuffaceous sandstone. Pentz soils are found in hills and are not considered prime farmland.

4.3 National Wetlands Inventory

The USFWS National Wetlands Inventory (NWI) was used to identify any previously mapped aquatic features within the study area (USFWS, 1987). The NWI map depicts Bear Creek as the only aquatic feature within the study area. This feature matches the findings of the March 8, 2017 field visit.

4.4 Local Hydrology

The entire study area is within the Lower Bear Creek watershed. Bear Creek flows westward through natural and man-made irrigation ditches within the valley floor, toward White Slough and then the Delta. Bollea Road is the topographic high point within the study area with stormwater being directed to the roadside ditches. These ditches flow towards and into Bear Creek which represents the topographic low point of the study area.

5.0 RESULTS

5.1 Existing Conditions

The study area is largely disturbed with Bollea Road bisecting the study area and several ruderal/disturbed private properties surrounding the road. The existing concrete bridge and new temporary bypass were also observed within the study area crossing Bear Creek. Vegetation was identifiable to the degree necessary to determine the presence or absence of hydrophytic vegetation. The percent of vegetative cover varied from 100 to 0 percent based on the habitat. Overall, normal hydrologic conditions were present within the study area.

5.2 Potential Waters of the U.S. Occurring Within the Study Area

The only potential Waters of the U.S. identified within the study area are Bear Creek (approximately 0.102 acres; 130 linear feet) and the man-made pond (approximately 0.22 acres) (**Figure 4**).

6.0 DISCUSSION AND ANALYSIS

The entire study area is located within the Lower Bear Creek watershed, a TNW that flows directly into the Delta. Waters of the U.S. located in the study area are depicted in **Figure 4**. USACE Wetland Delineation Forms can be found in **Appendix C** and an USACE Aquatic Resources Excel worksheet is provided in **Appendix D**.

Potential jurisdictional Waters on the site are limited to Bear Creek and the man-made pond.

Bear Creek (Riverine)

Bear Creek is designated a USGS blue-line stream located in the middle of the study area. Approximately 130 linear feet of channel flow through the site with a clearly delineated OHWM on both banks and a bed that contains sorted sediments and a lack of terrestrial vegetation. Approximately 0.102 acres of Bear Creek is within the study area (**Table 1**). Aerial imagery and aquatic invertebrates were used to classify the stream as intermittent as water was present within the stream channel during the March 8, 2017 site visit.

Pond (Lacustrine)

Approximately 0.220 acres of a man-made pond located occurs within the study area (**Table 1**). While the pond is man-made, it is connected to Bear Creek through culverts and roadside ditches. The pond contains a clearly delineated OHWM with internal vegetation dominated by large willows (*Salix* spp.).

TABLE 1
AQUATIC RESOURCES WITHIN THE STUDY AREA

Feature Type	Cowardin Classification	Latitude	Longitude	Size
Bear Creek	Lacustrine (L2)	38.19339000	-120.98257900	0.102 acres
Pond	Riverine (RR)	38.19439900	-120.98207600	0.220 acres

7.0 CONCLUSION

AES conducted a delineation of potential Waters of the U.S. within the 4.434-acre study area on March 8, 2017. Bear Creek and the man-made pond were identified as being potentially jurisdictional under the CWA (**Section 6.0**). Field observations and analysis of local hydrology determined that there is a direct connection from Bear Creek to the Delta, and from the man-made pond to Bear Creek. If the USACE concurs with this preliminary jurisdictional determination for the Waters within the study area, it would have regulatory authority over these features. However, determination of the jurisdictional status of these features is at the discretion of the USACE and would be decided through the verification process. The USACE evaluates jurisdictional determinations for the significant nexus standard, in accordance with the Rapanos and SWANCC decisions, on a site-specific basis.

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APPENDICES

APPENDIX A

SITE PHOTOGRAPHS



PHOTO 1: Grassland – northeast corner of site.



PHOTO 2: Riparian - upstream of existing bridge.



PHOTO 3: Bear Creek – downstream of existing bridge.



PHOTO 4: Topographic Depression – north of existing bridge.



PHOTO 5: Ruderal/Disturbed – south of existing bridge.

Appendix B

List of Vascular Plant Species Observed

Table 1. List of Vascular Plant Species Observed at Bollea Road Bridge Replacement Project on March 8, and July 20, 2017. Wetland Indicator Status were classified according to the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016).

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Achillea millefolium</i>	yarrow	Asteraceae	native	annual herb	FACU
<i>Achyrachaena mollis</i>	blow wives	Asteraceae	native	annual herb	FAC
<i>Acmispon glaber</i>	deerweed	Fabaceae	native	perennial herb	UPL
<i>Agrostis stolonifera</i>	redtop	Poaceae	non-native	perennial grass	FACW
<i>Amsinckia menziesii</i>	common fiddleneck	Boraginaceae	native	annual herb	UPL
<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	native	perennial herb	FAC
<i>Avena barbata</i>	slender wild oat	Poaceae	non-native	annual grass	UPL
<i>Avena fatua</i>	wild oats	Poaceae	non-native	annual grass	UPL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	native	shrub	UPL
<i>Baccharis salicifolia</i>	mulefat	Asteraceae	native	shrub	FAC
<i>Briza minor</i>	little rattlesnake grass	Poaceae	non-native	annual grass	FAC
<i>Bromus diandrus</i>	ripgut brome	Poaceae	non-native	annual grass	UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	non-native	annual grass	FACU
<i>Bromus madritensis ssp. madritensis</i>	foxtail chess	Poaceae	non-native	annual grass	UPL
<i>Calandrinia menziesii</i>	red maids	Montiaceae	native	annual herb	UPL
<i>Cardamine oligosperma</i>	bitter cress	Brassicaceae	native	annual/perennial herb	FAC
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	non-native	annual herb	UPL
<i>Carex nudata</i>	torrent sedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Ceanothus cuneatus</i>	buckbrush	Rhamnaceae	native	perennial shrub	UPL
<i>Clarkia sp.</i>	clarkia	Onagraceae	native	annual herb	UPL
<i>Croton setiger</i>	turkey-mullein	Euphorbiaceae	native	perennial herb	UPL
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Dactylis glomerata</i>	orchard grass	Poaceae	non-native	perennial grass	FACU
<i>Dichelostemma capitatum</i>	wild hyacinth	Themidaceae	native	perennial herb	FACU
<i>Diplacus aurantiacus</i>	Sticky monkeyflower	Phrymaceae	native	shrub	FACU
<i>Elymus glaucus</i>	blue wildrye	Poaceae	native	perennial herb	FACU
<i>Epilobium ciliatum</i>	slender willow herb	Onagraceae	native	perennial herb	FACW

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Epilobium densiflorum</i>	willow herb	Onagraceae	native	annual herb	FACW
<i>Erigeron canadensis</i>	Canada horseweed	Asteraceae	native	annual herb	FACU
<i>Eriodictyon californicum</i>	yerba santa	Boraginaceae	native	shrub	FACU
<i>Erodium botrys</i>	big heron bill	Geraniaceae	non-native	annual herb	FACU
<i>Erodium cicutarium</i>	red-stemmed filaree	Geraniaceae	non-native	annual herb	UPL
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	native	annual/perennial herb	UPL
<i>Festuca microstachys</i>	small fescue	Poaceae	native	annual grass	UPL
<i>Festuca perennis (Lolium perenne)</i>	rye grass	Poaceae	non-native	annual/perennial herb	FAC
<i>Frangula californica ssp.tomentella</i>	hoary cofeeberry	Rhamnaceae	native	shrub	UPL
<i>Galium aparine</i>	cleavers	Rubiaceae	native	annual herb	FACU
<i>Gastridium phleoides</i>	nit grass	Poaceae	non-native	annual grass	FACU
<i>Geranium dissectum</i>	wild geranium	Geraniaceae	non-native	annual herb	UPL
<i>Helminthotheca echinoides</i>	bristly ox-tongue	Asteraceae	native	annual/perennial herb	FAC
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae	native	shrub	UPL
<i>Hirschfeldia incana</i>	short-podded mustard	Brassicaceae	native	perennial herb	UPL
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	native	perennial grass	FACW
<i>Hordeum marinum</i>	barley	Poaceae	non-native	annual grass	FAC
<i>Hypericum concinnum</i>	gold wire	Hypericaceae	native	perennial herb	UPL
<i>Hypochaeris glabra</i>	smooth cats ear	Asteraceae	non-native	annual herb	UPL
<i>Hypochaeris radicata</i>	hairy cats ear	Asteraceae	non-native	annual herb	FACU
<i>Juglans hindsii</i>	northern California black walnut	Juglandaceae	native	tree	FAC
<i>Juncus acuminatus</i>	tapered rush	Juncaceae	native	perennial herb	OBL
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	non-native	annual herb	FACU
<i>Lathyrus jepsonii</i>	Jepson's pea	Fabaceae	native	annual herb	OBL
<i>Leontodon saxatilis</i>	hawkbit	Asteraceae	non-native	annual herb	FACU
<i>Logfia filaginoides</i>	California cottonrose	Asteraceae	native	annual herb	UPL
<i>Logfia gallica</i>	narrowleaf cottonrose	Asteraceae	non-native	annual herb	UPL
<i>Lonicera interrupta</i>	chaparral honeysuckle	Caprifoliaceae	native	vine/shrub	UPL
<i>Lupinus bicolor</i>	lupine	Fabaceae	native	annual/perennial herb	UPL
<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	non-native	annual herb	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Madia exigua</i>	small tarweed	Asteraceae	native	annual herb	UPL
<i>Marah fabacea</i>	California man-root	Cucurbitaceae	native	perennial herb/vine	UPL
<i>Marrubium vulgare</i>	horehound	Lamiaceae	non-native	Perennial herb	FACU
<i>Medicago polymorpha</i>	burclover	Fabaceae	non-native	annual herb	FACU
<i>Melilotus indicus</i>	annual yellow clover	Fabaceae	non-native	annual herb	FACU
<i>Microseris douglasii</i>	Douglas' microseris	Asteraceae	native	annual herb	FACU
<i>Minuartia douglasii</i>	Douglas' sandwort	Caryophyllaceae	native	annual herb	FACU
<i>Pellaea andromedifolia</i>	coffee fern	Pteridaceae	native	perennial	UPL
<i>Pentagramma triangularis</i>	gold back fern	Pteridaceae	native	perennial	UPL
<i>Phyla nodiflora</i>	common lippia	Verbenaceae	native	perennial herb	FACW
<i>Pinus sabiniana</i>	foothill pine	Pinaceae	native	tree	UPL
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	non-native	perennial herb	FAC
<i>Plectritis macrocera</i>	plecritis	Valerianaceae	native	annual herb	FACU
<i>Poa secunda</i>	one-sided blue grass	Poaceae	native	perennial grass	FACU
<i>Quercus lobata</i>	valley oak	Fagaceae	native	tree	FACU
<i>Quercus wislizeni</i>	blue oak	Fagaceae	native	tree	UPL
<i>Ranunculus californicus</i>	buttercup	Ranunculaceae	native	perennial herb	FACU
<i>Rubus ursinus</i>	California black-berry	Rosaceae	native	perennial vine	FAC
<i>Salix laevigata</i>	red willow	Salicaceae	native	tree	FACW
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	native	tree	FACW
<i>Salix exigua</i>	sandbarwillow	Salicaceae	native	tree or shrub	FACW
<i>Sambucus nigra ssp. caerulea</i>	elderberry	Adoxaceae	native	shrub	FACU
<i>Silene gallica</i>	common catchfly	Caryophyllaceae	non-native	annual herb	UPL
<i>Silybum marianum</i>	milk thistle	Asteraceae	non-native	annual/perennial herb	UPL
<i>Sonchus asper</i>	prickly sow thistle	Asteraceae	non-native	annual herb	FAC
<i>Sonchus oleraceus</i>	sow thistle	Asteraceae	non-native	annual herb	UPL
<i>Spergularia rubra</i>	purple sand spurry	Caryophyllaceae	non-native	annual/perennial herb	FAC
<i>Stachys ajugoides</i>	ajuga hedge nettel	Lamiaceae	native	perennial herb	OBL
<i>Stellaria media</i>	chickweed	Caryophyllaceae	non-native	annual herb	FACU

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Symphoricarpos mollis</i>	creeping snowberry	Caprifoliaceae	native	shrub	FACU
<i>Toxicodendron diversilobum</i>	poisen oak	Anacardiaceae	native	perennial vine/shrub	FACU
<i>Trifolium sp.</i>	clover	Fabaceae	N/A	annual herb	N/A
<i>Typha sp.</i>	cat tail	Typhaceae	native	perennial herb (aquatic)	OBL
<i>Urtica dioica</i>	stinging nettle	urticaceae	native	perennial herb	FAC
<i>Verbascum blattaria</i>	moth mullein	Scrophulariaceae	non-native	perennial herb	UPL
<i>Veronica anagallis-aquatica</i>	water speedwell	Plantaginaceae	non-native	perennial herb	OBL
<i>Vicia villosa</i>	vetch	fabaceae	non-native	annual herb/vine	UPL
<i>Xanthium strumarium</i>	rough cocklebur	Asteraceae	native	annual herb	FAC

APPENDIX C

USACE WETLAND DETERMINATION FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bolton Rd Bridge Project City/County: San Joaquin Co. Sampling Date: 2017/03/08
 Applicant/Owner: San Joaquin County State: CA Sampling Point: 1A
 Investigator(s): Nicholas Bonzey, David Mulet Section, Township, Range: Sect 16, Township 4N, Range 9 East
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): _____ Lat: 38.194196 Long: -120.98225 Datum: NAD83
 Soil Map Unit Name: Acampo NWI classification: N/A

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 <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>Small depression has hydrophytic vegetation, hydrology conditions but no hydric soil indicators.</u>	

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species <u>2</u> x 2 = <u>4</u> FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species <u>1</u> x 5 = <u>5</u> Column Totals: <u>9</u> (A) <u>3</u> (B) Prevalence Index = B/A = <u>9/3 = 3</u>
Sapling/Shrub Stratum 1. <u>UTR</u> _____ 2. _____ 3. _____ 4. _____ 5. _____ Total Cover: <u>0</u>				
Herb Stratum 1. <u>Juncus acuminatus</u> <u>60%</u> <u>D</u> <u>OBL</u> 2. <u>Geranium dissectum</u> <u>10%</u> <u>D</u> <u>UPL</u> 3. <u>Cyperus eragrostis</u> <u>40%</u> <u>D</u> <u>FACW</u> 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ Total Cover: <u>110%</u>				
Woody Vine Stratum 1. <u>UTR</u> _____ 2. _____ Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				
Remarks: <u>Hydrophytic Vegetation present.</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input checked="" type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

Sampling Point: 1A

HYDROLOGY

Arid West – Version 11-1-2006

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bolton Rd. Bridge Project City/County: San Joaquin Sampling Date: 2017/03/08
 Applicant/Owner: San Joaquin Co State: CA Sampling Point: 1 B
 Investigator(s): Nicholas Bonzey, David Moldoff Section, Township, Range: Sec 16, Township 4N, Range 9 East
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 1%
 Subregion (LRR): _____ Lat: 38.1941 Long: -120.9813 Datum: NAD83
 Soil Map Unit Name: Acumpe NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes _____ No <input checked="" type="checkbox"/>	
Remarks: <u>upland plants, no hydric soil indicators, or wetland hydrology.</u>		

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	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 = _____
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Sapling/Shrub Stratum				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 = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	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 = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Herb Stratum				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 = _____
1. <u>Avena barbata</u>	<u>40%</u>	<u>D</u>	<u>UPL</u>	
2. <u>Sonchus oleraceus</u>	<u>10%</u>		<u>UPL</u>	
3. <u>Geranium dissectum</u>	<u>10%</u>		<u>UPL</u>	
4. <u>Hirschfeldia incana</u>	<u>10%</u>		<u>UPL</u>	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 = _____
5. <u>Bromus madriensis</u>	<u>30%</u>	<u>D</u>	<u>UPL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	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 = _____
Total Cover: _____				
Woody Vine Stratum				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	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 = _____
Total Cover: <u>100</u>				
% Bare Ground in Herb Stratum <u>5%</u>	% Cover of Biotic Crust <u>0</u>			
Remarks:				

SOIL

Sampling Point: 1B

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)	
Primary Indicators (any one indicator is sufficient)				
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)		<input type="checkbox"/> Water Marks (B1) (Riverine)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)		<input type="checkbox"/> Sediment Deposits (B2) (Riverine)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)		<input type="checkbox"/> Drift Deposits (B3) (Riverine)	
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)		<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)		<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)		<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Water-Stained Leaves (B9)			<input type="checkbox"/> Shallow Aquitard (D3)	
			<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:				
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks:				

APPENDIX D

USACE AQUATIC RESOURCES SHEET

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Bear Creek	CALIFORNIA	R4		Area	0.102		DELINEATE	38.19339000	-120.98257900	
Pond	CALIFORNIA	L2		Area	0.22		ISOLATE	38.19439900	-120.98207600	

Appendix E

NRCS SOIL SURVEY



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties; and San Joaquin County, California



March 28, 2017

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

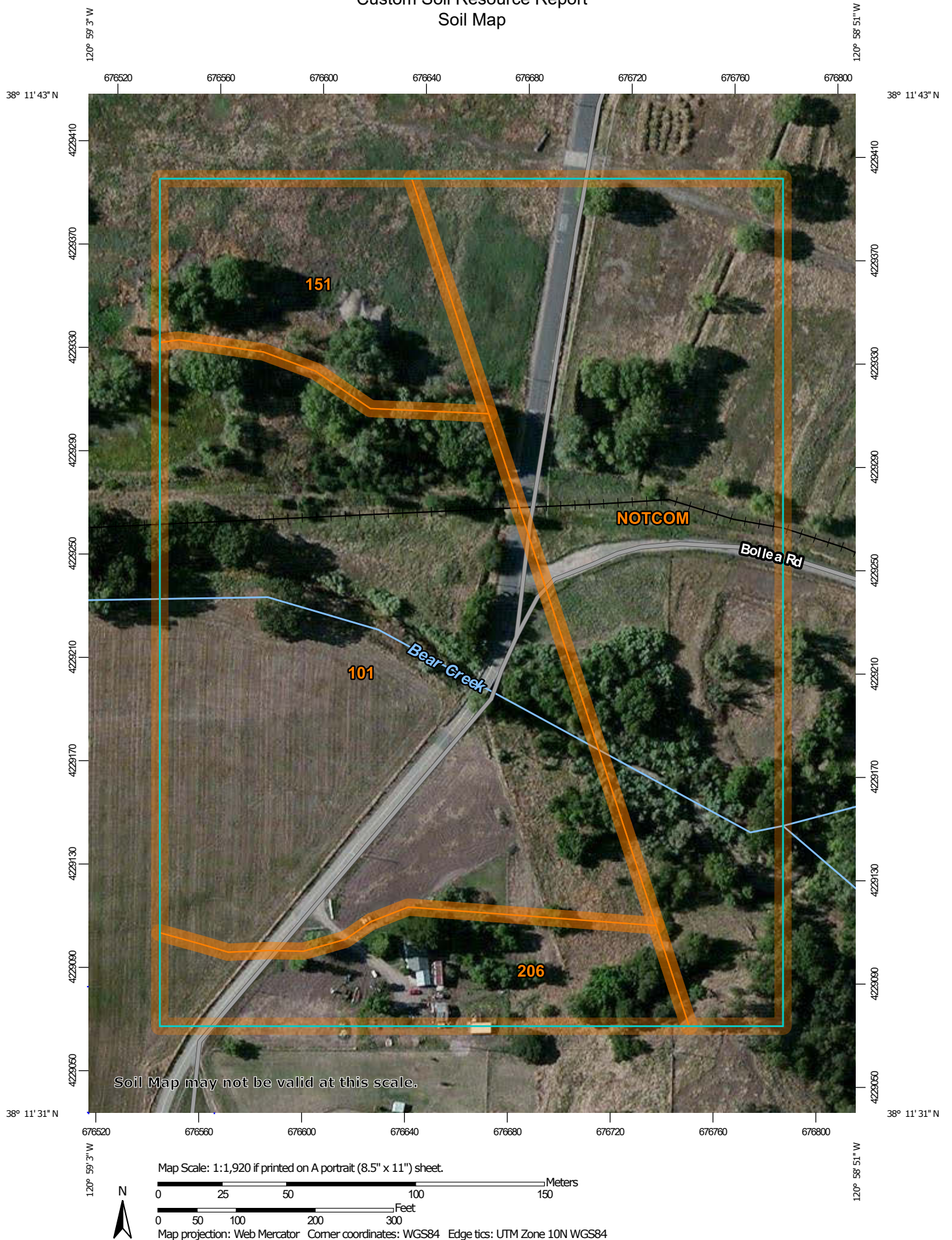
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map


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

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	7.4	37.3%
Subtotals for Soil Survey Area		7.4	37.3%
Totals for Area of Interest		19.7	100.0%

San Joaquin County, California (CA077)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	8.4	42.4%
151	Dumps, tailings	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	1.9	9.5%
Subtotals for Soil Survey Area		12.4	62.7%
Totals for Area of Interest		19.7	100.0%

Map Unit Descriptions

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

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

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

components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties

NOTCOM—No Digital Data Available

Map Unit Composition

Notcom: 100 percent

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

Description of Notcom

Properties and qualities

San Joaquin County, California

101—Acampo sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhr0

Elevation: 10 to 150 feet

Mean annual precipitation: 15 inches

Mean annual air temperature: 61 degrees F

Frost-free period: 260 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Acampo and similar soils: 85 percent

Minor components: 15 percent

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

Description of Acampo

Setting

Landform: Fan terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

A - 0 to 19 inches: sandy loam

Bw - 19 to 47 inches: sandy loam

Bkqm1 - 47 to 49 inches: cemented

Bkqm2 - 49 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 40 to 60 inches to duripan; 43 to 60 inches to duripan

Natural drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent

Custom Soil Resource Report

Hydric soil rating: No

Devries

Percent of map unit: 4 percent

Landform: Rims

Hydric soil rating: Yes

Unnamed, fine textured subsoil soils

Percent of map unit: 4 percent

Hydric soil rating: No

Tokay

Percent of map unit: 2 percent

Hydric soil rating: No

151—Dumps, tailings

Map Unit Composition

Dumps: 45 percent

Tailings: 45 percent

Minor components: 10 percent

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

Description of Dumps

Interpretive groups

Land capability classification (irrigated): 8w

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: A

Hydric soil rating: No

Description of Tailings

Interpretive groups

Land capability classification (irrigated): 8w

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Pits

Percent of map unit: 5 percent

Hydric soil rating: No

Xerofluvents

Percent of map unit: 5 percent

Hydric soil rating: No

206—Pentz sandy loam, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hhvd
Elevation: 130 to 300 feet
Mean annual precipitation: 16 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 270 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pentz

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from basic andesitic, tuffaceous sandstone

Typical profile

A - 0 to 4 inches: sandy loam
Bw - 4 to 15 inches: sandy loam
Cr - 15 to 19 inches: weathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (R018XD076CA)
Hydric soil rating: No

Minor Components

Bellota

Percent of map unit: 3 percent

Hydric soil rating: No

Alamo

Percent of map unit: 2 percent

Landform: Drainageways

Hydric soil rating: Yes

Pardee

Percent of map unit: 2 percent

Hydric soil rating: No

Redding

Percent of map unit: 2 percent

Hydric soil rating: No

Peters

Percent of map unit: 2 percent

Hydric soil rating: No

Lithic xerorthents

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, deep mod fine texture soils

Percent of map unit: 2 percent

Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Steel

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.


The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report Map—Corrosion of Steel




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 High
 Moderate
 Low
 Not rated or not available


Soil Rating Lines

 High
 Moderate
 Low
 Not rated or not available






Soil Rating Points

 High
 Moderate
 Low
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Steel

Corrosion of Steel— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

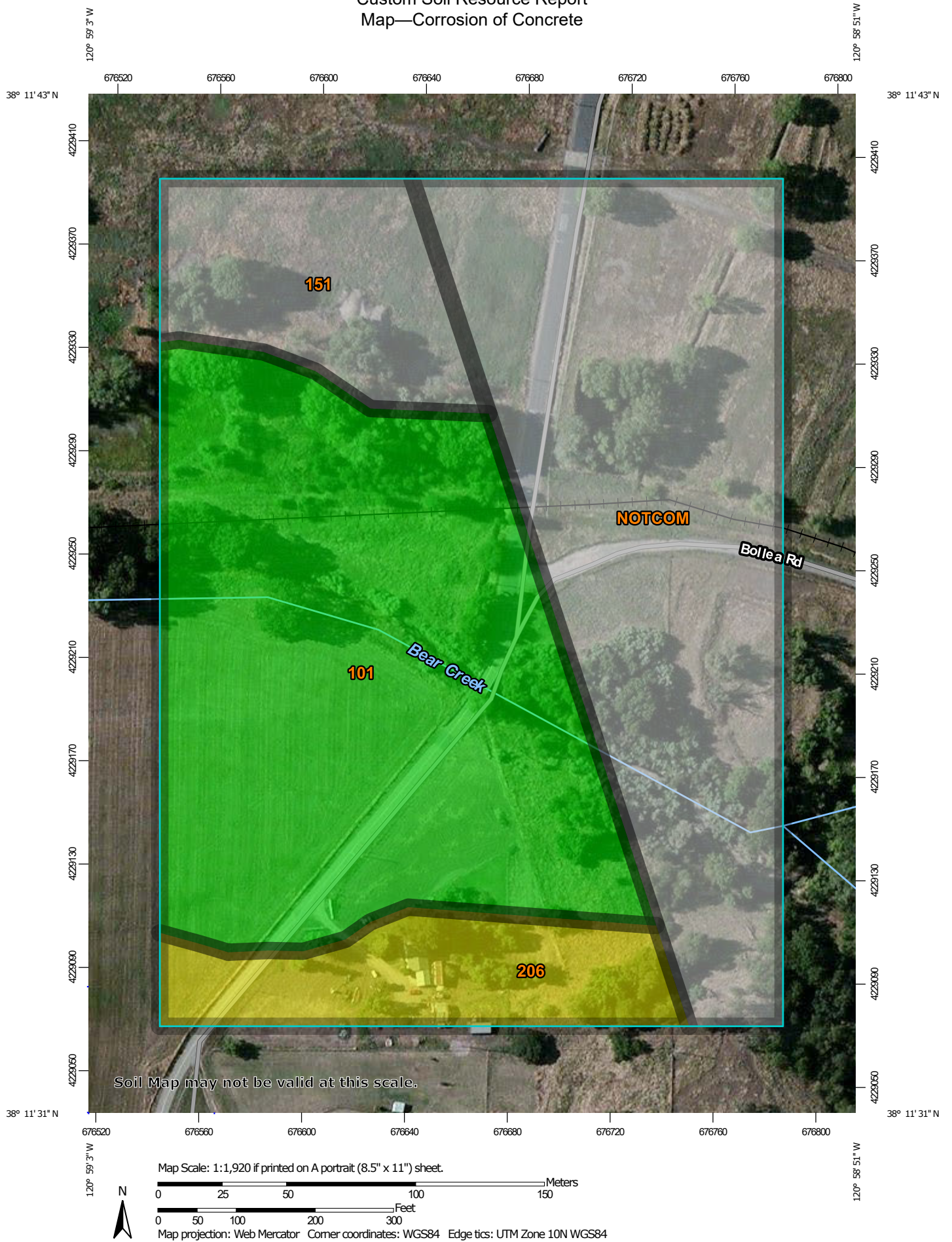
Corrosion of Steel— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderate	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Corrosion of Steel*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher**Corrosion of Concrete**

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.


The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report
Map—Corrosion of Concrete




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 High
 Moderate
 Low
 Not rated or not available


Soil Rating Lines

 High
 Moderate
 Low
 Not rated or not available



Soil Rating Points

 High
 Moderate
 Low
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Corrosion of Concrete

Corrosion of Concrete— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Corrosion of Concrete— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Low	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Corrosion of Concrete*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher**Land Classifications**

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Soil Taxonomy Classification

This rating presents the taxonomic classification based on Soil Taxonomy.

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. This table shows the classification

of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in sol. An example is Alfisols.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (Ud, meaning humid, plus alfs, from Alfisols).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (Hapl, meaning minimal horizonation, plus udalfs, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

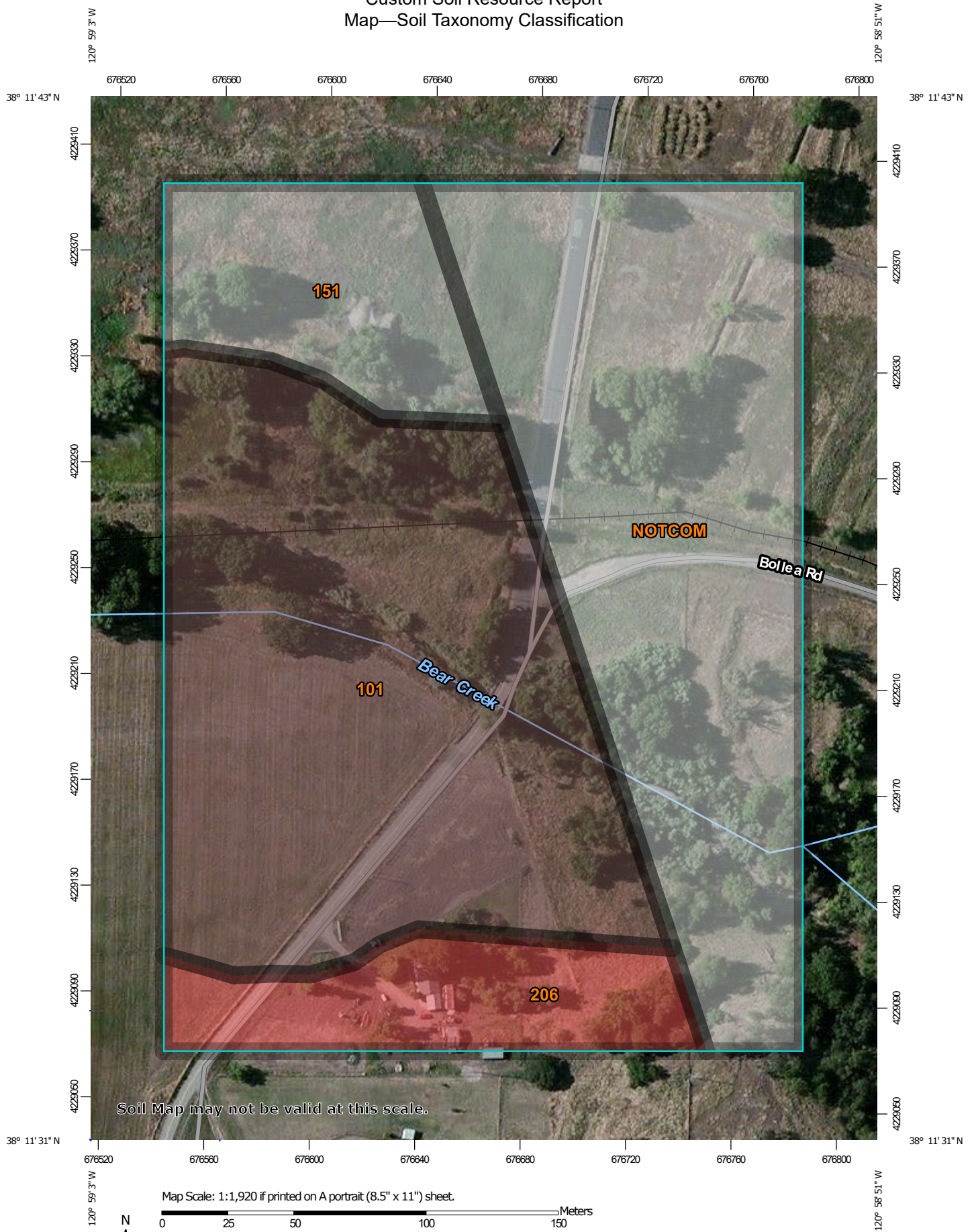
References:

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Custom Soil Resource Report


Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. (The soils in a given survey area may have been classified according to earlier editions of this publication.)

Custom Soil Resource Report Map—Soil Taxonomy Classification






MAP LEGEND

Area of Interest (AOI)




 Area of Interest (AOI)

Soils




Soil Rating Polygons

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available


Soil Rating Lines

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available

Soil Rating Points

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Soil Taxonomy Classification

Soil Taxonomy Classification— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Soil Taxonomy Classification— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Coarse-loamy, mixed, thermic Typic Haploxerolls	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Loamy, mixed, thermic, shallow Ultic Haploxerolls	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Soil Taxonomy Classification*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Lower**Farmland Classification**

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.


Custom Soil Resource Report Map—Farmland Classification



Custom Soil Resource Report









MAP LEGEND








Area of Interest (AOI)

-  Area of Interest (AOI)




Soils








Soil Rating Polygons






-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available







Soil Rating Lines










-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained

-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Soil Rating Points

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available


Water Features

MAP INFORMATION

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties

Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California

Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification

Farmland Classification— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Farmland Classification— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated	8.4	42.4%
151	Dumps, tailings	Not prime farmland	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Not prime farmland	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Ecological Site Name: NRCS Rangeland Site

An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service. Descriptions of those displayed in this map and summary table may also be accessed through the Ecological Site Assessment tab in Web Soil Survey.

Ecological sites and their respective unique set of characteristics are uniquely identified by the Ecological Site ID. The same Ecological Site Name may be assigned to multiple Ecological Site IDs. If you wish to display a map of unique

Custom Soil Resource Report

ecological sites, it is recommended that you select the Ecological Site ID attribute from the choice list.


Custom Soil Resource Report

Map—Ecological Site Name: NRCS Rangeland Site





MAP LEGEND

Area of Interest (AOI)



 Area of Interest (AOI)

Soils



Soil Rating Polygons

 SHALLOW LOAMY
 Not rated or not available


Soil Rating Lines

 SHALLOW LOAMY
 Not rated or not available






Soil Rating Points

 SHALLOW LOAMY
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Ecological Site Name: NRCS Rangeland Site

Ecological Site Name: NRCS Rangeland Site— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Ecological Site Name: NRCS Rangeland Site— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes		8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	SHALLOW LOAMY	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Ecological Site Name: NRCS Rangeland Site

Class: NRCS Rangeland Site

Aggregation Method: Dominant Condition

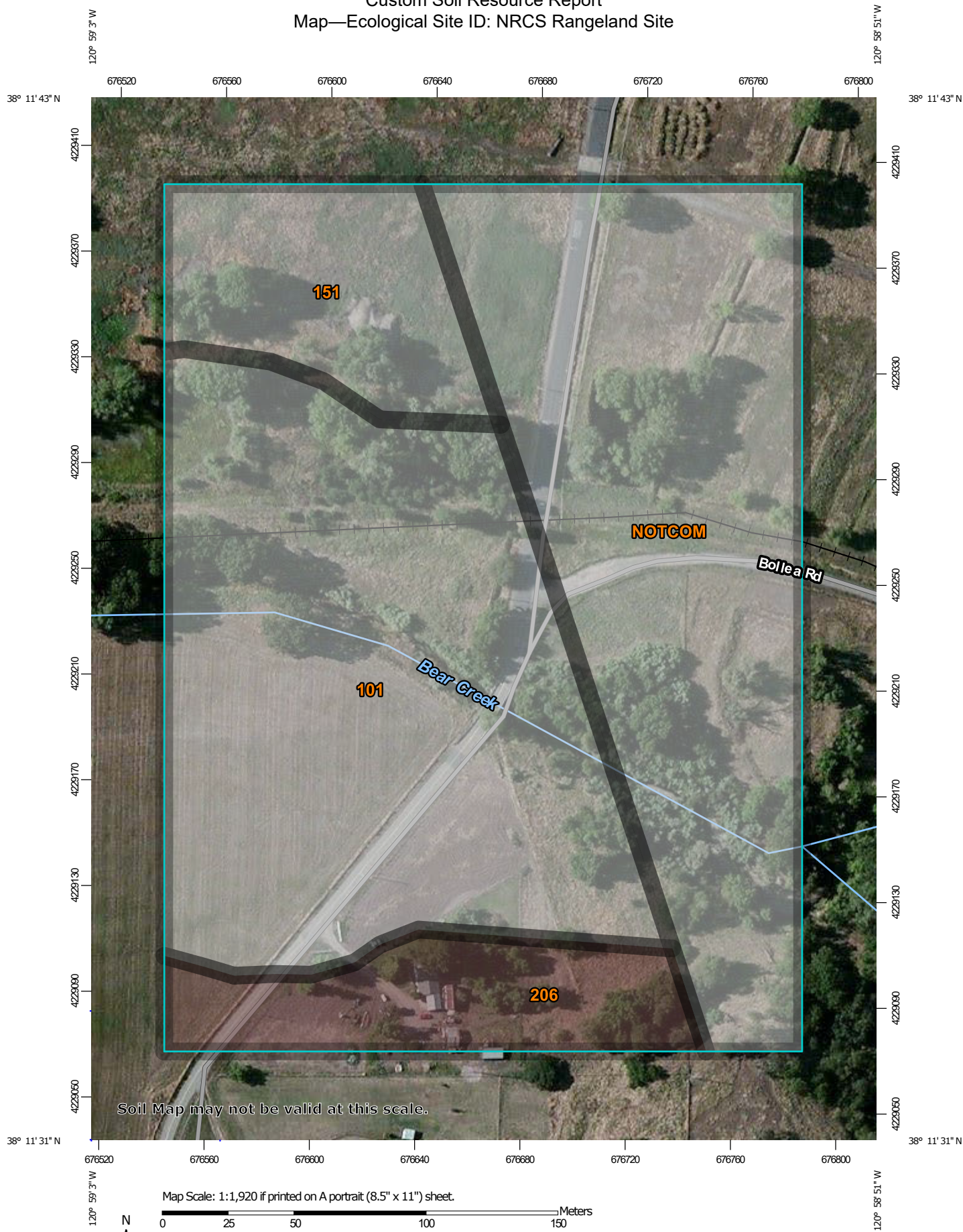
Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Ecological Site ID: NRCS Rangeland Site

An "ecological site ID" is the symbol assigned to a particular ecological site. An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Ecological Site ID: NRCS Rangeland Site



Soil Map may not be valid at this scale.


Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils

Soil Rating Polygons

 R018XD076CA


 Not rated or not available


Soil Rating Lines

 R018XD076CA


 Not rated or not available

Soil Rating Points

 R018XD076CA

 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties

Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California

Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Ecological Site ID: NRCS Rangeland Site

Ecological Site ID: NRCS Rangeland Site— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Ecological Site ID: NRCS Rangeland Site— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes		8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	R018XD076CA	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Ecological Site ID: NRCS Rangeland Site*Class:* NRCS Rangeland Site*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Lower**Land Management**

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Soil Rutting Hazard

The ratings in this interpretation indicate the hazard of surface rut formation through the operation of forestland equipment. Soil displacement and puddling (soil deformation and compaction) may occur simultaneously with rutting.

Custom Soil Resource Report

Ratings are based on depth to a water table, rock fragments on or below the surface, the Unified classification of the soil, depth to a restrictive layer, and slope. The hazard is described as slight, moderate, or severe. A rating of "slight" indicates that the soil is subject to little or no rutting. "Moderate" indicates that rutting is likely. "Severe" indicates that ruts form readily.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Soil Rutting Hazard




Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.

0 25 50 100 150 Meters
0 50 100 200 300 Feet


Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 Severe
 Moderate
 Slight
 Not rated or not available


Soil Rating Lines

 Severe
 Moderate
 Slight
 Not rated or not available






Soil Rating Points

 Severe
 Moderate
 Slight
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Soil Rutting Hazard

Soil Rutting Hazard— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Soil Rutting Hazard— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderate	Acampo (85%)	Low strength (0.50)	8.4	42.4%
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	Pentz (85%)	Low strength (0.50)	1.9	9.5%
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Soil Rutting Hazard— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Moderate	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Soil Rutting Hazard

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.


Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail)








MAP LEGEND

Area of Interest (AOI)






 Area of Interest (AOI)

Soils






Soil Rating Polygons

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available


Soil Rating Lines

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Soil Rating Points




 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Water Features


 Streams and Canals

Transportation

 Rails
 Interstate Highways

 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Off-Road, Off-Trail)

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Slight	Acampo (85%)		8.4	42.4%
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Slight	Pentz (85%)		1.9	9.5%
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Slight	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Management

Water Management interpretations are tools for evaluating the potential of the soil in the application of various water management practices. Example interpretations include pond reservoir area, embankments, dikes, levees, and excavated ponds.

Embankments, Dikes, and Levees

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. The soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the suitability of the undisturbed soil for supporting the embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those

Custom Soil Resource Report

that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.


Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Embankments, Dikes, and Levees




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available


Soil Rating Lines

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available



Soil Rating Points

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Embankments, Dikes, and Levees

Embankments, Dikes, and Levees— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Embankments, Dikes, and Levees— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Very limited	Acampo (85%)	Piping (1.00)	8.4	42.4%
				Thin layer (0.19)		
				Dusty (0.02)		
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Very limited	Pentz (85%)	Thin layer (1.00)	1.9	9.5%
				Piping (1.00)		
				Dusty (0.04)		
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Embankments, Dikes, and Levees— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Embankments, Dikes, and Levees

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.


Custom Soil Resource Report
Map—K Factor, Whole Soil



Custom Soil Resource Report
















MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)










Soils

Soil Rating Polygons
















	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Lines








	.02
	.05
	.10
	.15
	.17
	.20

	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Points

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Water Features

	Streams and Canals
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California,
Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—K Factor, Whole Soil

K Factor, Whole Soil— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

K Factor, Whole Soil— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	.20	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	.32	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—K Factor, Whole Soil*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher*Layer Options (Horizon Aggregation Method):* Surface Layer (Not applicable)**Soil Physical Properties**

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this

Custom Soil Resource Report

attribute for the component. For this soil property, only the representative value is used.


The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils

Soil Rating Polygons

 = 28.0000


 Not rated or not available


Soil Rating Lines

 = 28.0000


 Not rated or not available

Soil Rating Points

 = 28.0000

 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Saturated Hydraulic Conductivity (Ksat)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	28.0000	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	28.0000	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 60

Units of Measure: Centimeters

Linear Extensibility

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Custom Soil Resource Report


For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report Map—Linear Extensibility








MAP LEGEND

Area of Interest (AOI)






 Area of Interest (AOI)

Soils






Soil Rating Polygons

 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available


Soil Rating Lines

 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available

Soil Rating Points




 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways

 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Linear Extensibility

Linear Extensibility— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Linear Extensibility— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	1.5	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	1.5	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Linear Extensibility*Units of Measure:* percent*Aggregation Method:* Dominant Component*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher*Interpret Nulls as Zero:* No*Layer Options (Horizon Aggregation Method):* Depth Range (Weighted Average)*Top Depth:* 0*Bottom Depth:* 60*Units of Measure:* Centimeters**Soil Qualities and Features**

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Hydrologic Soil Group— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	A	8.4	42.4%
151	Dumps, tailings	A	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	D	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Drainage Class

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

Custom Soil Resource Report Map—Drainage Class





















MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons


	Excessively drained		Excessively drained
	Somewhat excessively drained		Somewhat excessively drained
	Well drained		Well drained
	Moderately well drained		Moderately well drained
	Somewhat poorly drained		Somewhat poorly drained
	Poorly drained		Poorly drained
	Very poorly drained		Very poorly drained
	Subaqueous		Subaqueous
	Not rated or not available		Not rated or not available

Soil Rating Lines






	Excessively drained
	Somewhat excessively drained
	Well drained
	Moderately well drained
	Somewhat poorly drained
	Poorly drained
	Very poorly drained
	Subaqueous
	Not rated or not available

Soil Rating Points


Water Features

 Streams and Canals

Transportation

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

Background

 Aerial Photography

MAP INFORMATION

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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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Table—Drainage Class

Drainage Class— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Drainage Class— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderately well drained	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Well drained	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Flooding Frequency Class

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

Custom Soil Resource Report

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

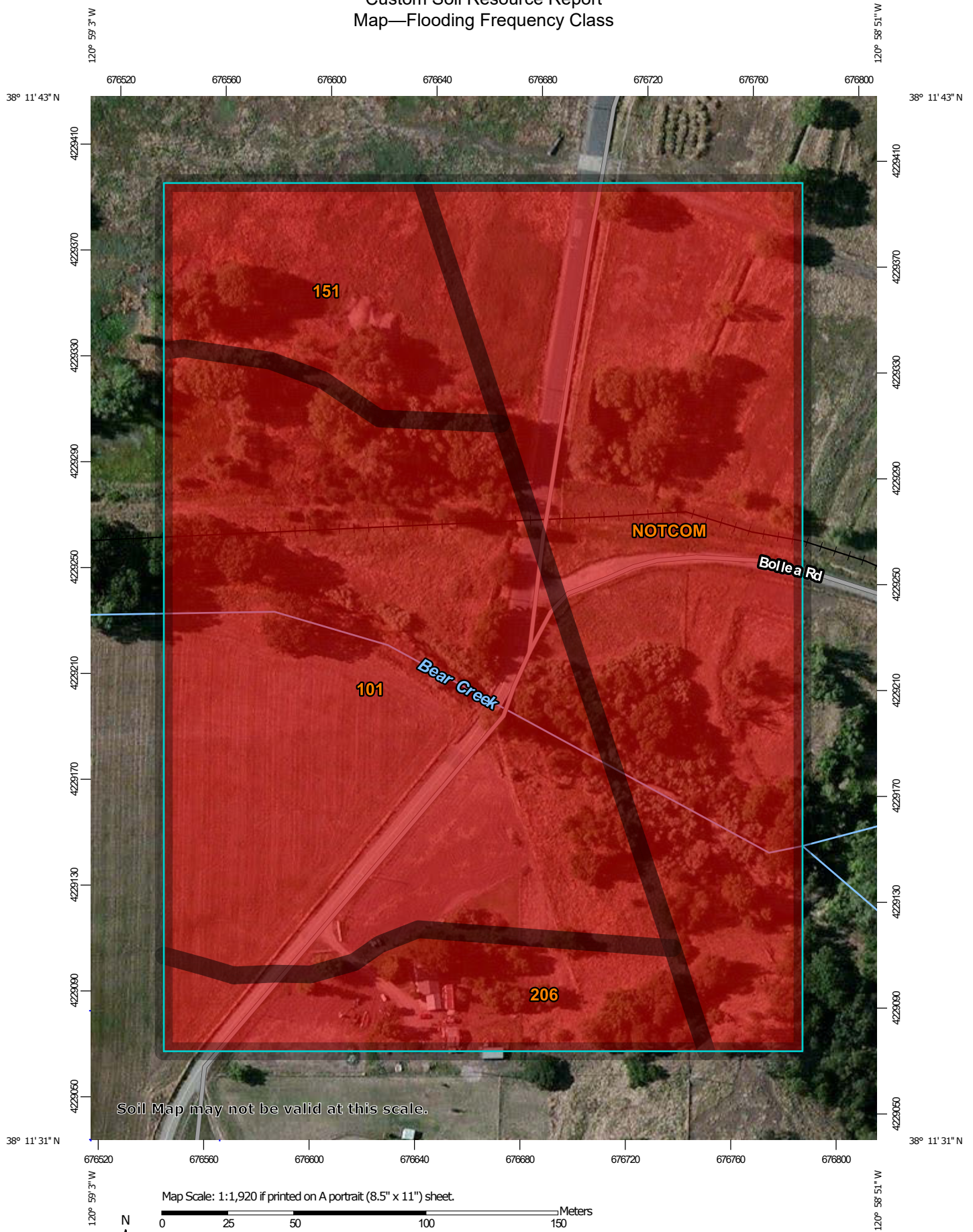
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report Map—Flooding Frequency Class



Soil Map may not be valid at this scale.

Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84








MAP LEGEND

Area of Interest (AOI)








 Area of Interest (AOI)

Soils







Soil Rating Polygons


-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent
-  Not rated or not available

Soil Rating Lines


-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent
-  Not rated or not available

Soil Rating Points






-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent

 Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Flooding Frequency Class

Flooding Frequency Class— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	None	7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Flooding Frequency Class— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	None	8.4	42.4%
151	Dumps, tailings	None	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	None	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Flooding Frequency Class*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* More Frequent*Beginning Month:* January*Ending Month:* December

Ecological Site Assessment

Individual soil map unit components can be correlated to a particular ecological site. The Ecological Site Assessment section includes ecological site descriptions, plant growth curves, state and transition models, and selected National Plants database information.

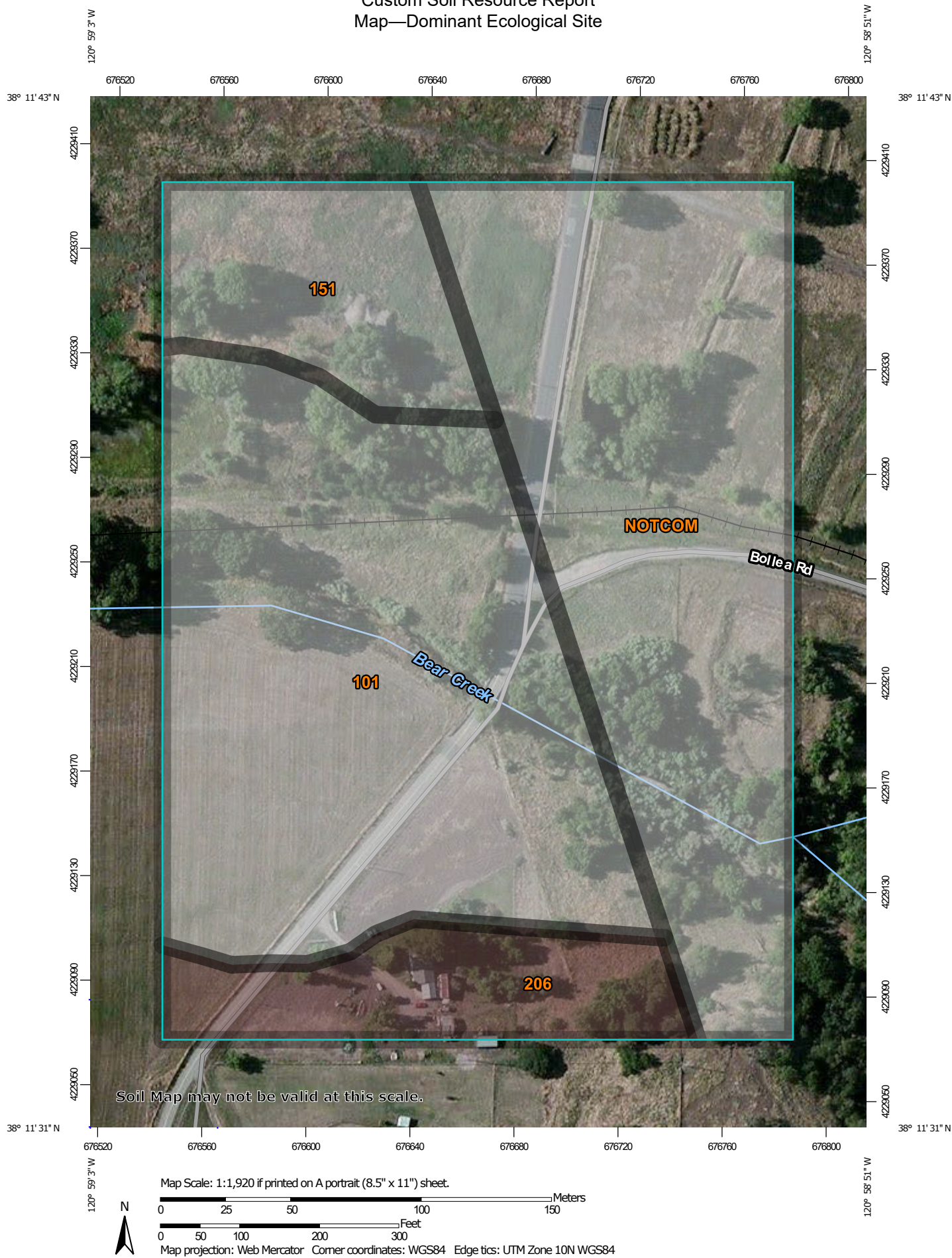
All Ecological Sites — Rangeland

An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site ID" is the symbol assigned to a particular ecological site.


The map identifies the dominant ecological site for each map unit, aggregated by dominant condition. Other ecological sites may occur within each map unit. Each map unit typically consists of one or more components (soils and/or miscellaneous areas). Each soil component is associated with an ecological site. Miscellaneous areas, such as rock outcrop, sand dunes, and badlands, have little or no soil material and support little or no vegetation and therefore are not linked to an ecological site. The table below the map lists all of the ecological sites for each map unit component in your area of interest.

Custom Soil Resource Report
Map—Dominant Ecological Site




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils

Soil Rating Polygons

 R018XD076CA


 Not rated or not available


Soil Rating Lines

 R018XD076CA


 Not rated or not available

Soil Rating Points

 R018XD076CA

 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Ecological Sites by Map Unit Component

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties					
Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	NOTCOM (100%)		7.4	37.3%
Subtotals for Soil Survey Area				7.4	37.3%
Totals for Area of Interest				19.7	100.0%

San Joaquin County, California					
Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Acampo (85%)		8.4	42.4%
		Tujunga (5%)			
		Devries (4%)			
		Unnamed, fine textured subsoil soils (4%)			
		Tokay (2%)			
151	Dumps, tailings	Dumps (45%)		2.1	10.8%
		Tailings (45%)			
		Pits (5%)			
		Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Pentz (85%)	R018XD076CA — SHALLOW LOAMY	1.9	9.5%
		Bellota (3%)			
		Alamo (2%)			
		Lithic Xerorthents (2%)			
		Pardee (2%)			
		Peters (2%)			
		Redding (2%)			
		Unnamed, deep mod fine texture soils (2%)			
Subtotals for Soil Survey Area				12.4	62.7%
Totals for Area of Interest				19.7	100.0%

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties		
Map Symbol	Map Unit Name	Farmland Classification
NOTCOM	No Digital Data Available	

Prime and other Important Farmlands—San Joaquin County, California		
Map Symbol	Map Unit Name	Farmland Classification
101	Acampo sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated

Custom Soil Resource Report

Prime and other Important Farmlands—San Joaquin County, California		
Map Symbol	Map Unit Name	Farmland Classification
151	Dumps, tailings	Not prime farmland
206	Pentz sandy loam, 2 to 15 percent slopes	Not prime farmland

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic surface layer. .

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed. Organic surface horizons are not displayed.

RUSLE2 Related Attributes—San Joaquin County, California								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
101—Acampo sandy loam, 0 to 2 percent slopes								
Acampo	85	—	A	.20	3	67.9	19.6	12.5
206—Pentz sandy loam, 2 to 15 percent slopes								
Pentz	85	—	D	.32	2	67.4	19.6	13.0

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on

observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Custom Soil Resource Report

Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				<i>Ft</i>	<i>Ft</i>		<i>Ft</i>				
NOTCOM—No Digital Data Available											
Notcom				—	—	—	—	—	—	—	

Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				<i>Ft</i>	<i>Ft</i>		<i>Ft</i>				
101—Acampo sandy loam, 0 to 2 percent slopes											
Acampo	A	Very low	Jan-Dec	—	—	—	—	—	None	—	None
151—Dumps, tailings											
Dumps	A	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Tailings	A	Very high	Jan-Dec	—	—	—	—	—	None	—	None
206—Pentz sandy loam, 2 to 15 percent slopes											
Pentz	D	Low	Jan-Dec	—	—	—	—	—	None	—	None

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff—Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
NOTCOM—No Digital Data Available			
Notcom	100	—	—

Custom Soil Resource Report

Hydrologic Soil Group and Surface Runoff—San Joaquin County, California			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
101—Acampo sandy loam, 0 to 2 percent slopes			
Acampo	85	Very low	A
151—Dumps, tailings			
Dumps	45	Very high	A
Tailings	45	Very high	A
206—Pentz sandy loam, 2 to 15 percent slopes			
Pentz	85	Low	D

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Custom Soil Resource Report

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APPENDIX C

NES

Bollea Road Bridge Replacement Project

San Joaquin County, California



Natural Environment Study (Minimal Impacts)

Bollea Road, San Joaquin County, CA

Bridge No. 29C-0413

“Wallace, CA” 7.5 Minute Topographic Quadrangle, T4N R9E Section 16, Mt. Diablo
Baseline Meridian

Caltrans District 10

BRLO-5929(236)

October 2019



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STATE OF CALIFORNIA
Department of Transportation
County of San Joaquin
Bridge No. 29C-0413


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Baseline Meridian
Caltrans District 10
BRLO-5929(236)

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SUMMARY

The County of San Joaquin (County), in cooperation with Calaveras County and the California Department of Transportation (Caltrans), proposes to replace Bollea Road Bridge (No. 29C-0413) with a new bridge that meets current American Association of State Highway and Transportation Officials (AASHTO) standard width requirements for a two-lane facility. The bridge is located on Bollea Road over Bear Creek, just west of State Route 12 and the community of Wallace. The bridge, comprised of two railcars welded together, was built to create a 19-foot wide bridge intended to be a temporary replacement of a timber bridge that washed out in 1998. The existing structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for Federal Highway Administration (FHWA) by Caltrans.

The replacement bridge would be constructed where the existing bridge is located, and the temporary creek crossing, installed under a lake or streambed alteration (LSA) program notification of emergency work, would continue to be used as a detour route during construction. The Bollea Road Bridge Replacement Project (Proposed Project) would require replacement of the existing bridge, removal of the temporary bypass, and minimal acquisition of both permanent and temporary rights-of-way adjacent to the bridge.

The Proposed Project is funded by the Federal HBP Program and requires compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The lead agency for CEQA compliance is the County; the federal lead agency for NEPA compliance is Caltrans, as authorized under the NEPA Assignment Memorandum of Agreement between Caltrans and the FHWA.

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for the Proposed Project is being, or has been, carried out by the California Department of Transportation (Caltrans) under its assumption of responsibility pursuant to National Environmental Policy Act (NEPA) Assignment MOU (23 USC) 326).

The results of an environmental assessment of the biological study area (BSA) observed no special-status plant or animal species. Based on habitat analysis for plant species, seven federal or State listed threatened, endangered, or species of special concern have the potential to occur within the BSA. Based on the habitat analysis for animal species, three amphibian, one bird, two fish, and one reptile species with federal or State statuses of threatened, endangered, or species of special concern have the potential to occur within the BSA. None were observed within the BSA. The Proposed Project *may affect*, but is *not likely to adversely affect* California tiger salamander, California red-legged frog, valley elderberry beetle, and lone manzanita. The project will have no adverse impacts to Essential Fish Habitat (EFH) for Chinook salmon. There will be *no effect* to all other species listed on the USFWS and NMFS species lists.

Both temporary and permanent impacts on habitats could result from the Proposed Project. Temporary impacts to Bear Creek and adjacent ruderal/disturbed habitats would occur due to the removal of the temporary stream crossing. Avoidance and minimization measures have been included to ensure that the removal of the temporary stream crossing and all other in-stream work occur during the dry season and that appropriate permits be obtained and adhered to. Under the Preferred Alternative (375-foot curve), approximately 0.004 acre of permanent impact and 0.007 acre of temporary impact would occur to

the Waters of the U.S. (Bear Creek) due to the temporary creek crossing. Implementation of the avoidance and minimization measures would lessen the impacts to a negligible level. Permits will be needed for the in streambed work. Most permanent impacts would occur within the existing ruderal/disturbed habitat.

Permits will be required for impacts on Waters of the U.S., including a Section 404 Nationwide Permit from the United States Army Corps of Engineers, a Regional Water Quality Control Board Section 401 Water Quality Certification a Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife, and coverage under the National Pollutant Discharge Elimination System General Permit from the State Water Resources Control Board (stormwater pollution prevention plan).

TABLE I
PERMITS LIKELY TO BE REQUIRED UNDER THIS PROJECT

Permit Type	Issuing Agency
Clean Water Act Section 401 Water Quality Certification	Regional Water Quality Control Board 5S/Central Valley
Clean Water Act Section 404 permit (NWP 14 Linear Transportation Projects)	U.S. Army Corps of Engineers - Sacramento District
Lake and Streambed Alteration Agreement - Fish and Game Code Section 1600 permit	California Department of Fish and Wildlife - North Central Region (Region 2)
Construction General Permit Order 2009-009-DWQ Stormwater Pollution Prevention Plan	Regional Water Quality Control Board 5S/Central Valley

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1.0 INTRODUCTION

Bollea Road is a rural local County road with an Average Daily Traffic (ADT) volume of approximately 26 vehicles per day that serves less than ten residential parcels and ends approximately 1,500 feet south of the project site. The project site is located approximately 1,500 feet south of Highway 12 at the San Joaquin/Calaveras County line near the community of Wallace. The Bollea Road Bridge (No. 29C-413) is comprised of two railcars welded together to create a 56-foot long by 19-foot wide (clear width) bridge intended to be a temporary replacement of a timber bridge that washed out in 1998. In 1998, the replacement was only partial, leaving portions of wing walls and foundation walls in situ, while spread footings for the railcars were installed and cast in place. Caltrans determined that the bridge was structurally deficient as early as 2008, and creek flows during the winter of 2016/2017 exposed remnant foundation structures which split the flow of the creek, undermining bridge supports with resultant partial collapse of the structure.

In order to maintain traffic and access to the residential parcels during construction, two detour alternatives were being examined, however exigent circumstances required the construction of one of the alternatives prior to the completion of environmental studies. The Bollea Road Bridge provided the only ingress and egress for approximately six residences west of the bridge; in order to supply essentials (e.g. propane, groceries, and emergency access), the County was forced to construct an emergency bypass road approximately 15 feet east of the extant bridge, placing culverts to convey Bear Creek past the failed bridge. This activity was located within the project limits of disturbance already defined for the Proposed Project (**Appendix A**).

It is proposed to replace the existing 56-foot long by 19-foot wide (clear width) rail car bridge with a 67-foot long by 20-foot wide (clear width), single-span, post-tensioned concrete slab bridge supported on seat-type abutments and 24-inch cast-in-drilled-hole (CIDH) concrete piles. The railings proposed for the bridge will be the Caltrans standard Type 80 barrier rail. This NES has been prepared to discuss information regarding potential impacts to biological species as a result of the Bollea Road Bridge replacement (Proposed Project).

In order to maintain traffic and access to the residential parcels during construction an onsite detour is required. As a result of heavy storms flows during the winter of 2017, the south abutment of the existing bridge was undermined causing the County to close the bridge. In order to provide access to the residents south of the bridge, the County installed an emergency detour consisting of four corrugated metal pipes. It is the County's intent to leave the detour in place through construction of the new bridge.

1.1 PURPOSE AND NEED

The Proposed Project is needed to provide a permanent stable structure that will give access for residents needing to cross Bear Creek. The roadway approaching to the bridge from the north and south are tangent alignments, with the bridge tangent to the south approach. This alignment creates an angle point where the north end of the bridge meets the north approach. The elevation of the existing bridge is higher than either approach resulting in a rise or "hump" in the roadway. This difference in grade, along with the angle point in the alignment at the north approach causes a site distance issue for vehicles

approaching the bridge. It is proposed to replace the existing 56-foot long by 19-foot wide (clear width) rail car bridge with a 67-foot long by 20-foot wide (clear width), single-span, post tensioned concrete slab bridge, supported on seat type abutments and 24-inch cast-in-drilled-hole (CIDH) concrete piles. The profile grade for the new bridge will need to be raised approximately 0.55 feet to pass the 100-year storm event in conformance with the Caltrans Design Manual. The railings proposed for the bridge will be the Caltrans standard Type 80 barrier rail.

1.2 PROJECT LOCATION

The project site is located in Township 4 North, Range 9 East, Section 16, as depicted on the U.S. Geological Survey (USGS) "Wallace, CA" 7.5-minute topographic quadrangle. The project site includes the Bollea Road Bridge (No. 29C-413) over Bear Creek in eastern San Joaquin County, west of the community of Wallace; the project site extends far enough eastward to enter Calaveras County and encompasses a total of 4.434 acres. The study area is rural; surrounding land uses include rural residential uses, agriculture, and undeveloped open space (**Figures 1 and 2**). The total area of the project site is 4.434 acres.

1.3 PROJECT CHARACTERISTICS

The Proposed Project generally includes the following elements, as described in more detail below:

- Removal of the existing bridge across Bear Creek,
- Construction of a new bridge to meet current standards; and
- Removal of the temporary road crossing

The Proposed Action, identified by Federal Project Number BRLO-5929 (236), involves replacement of the Bollea Road Bridge (No. 29C-413) and removal of an emergency bypass crossing. San Joaquin County, in coordination Calaveras County and Caltrans District 10, is proposing to replace the existing bridge with a bridge that meets current AASHTO standard width requirements for a two-lane facility in conformance with the guidelines presented in the Design of Very Low Volume Local Roads.

Bollea Road has a prima facie 55 mile per hour speed limit, except in the vicinity of the bridge where the curves are posted for 25 miles per hour. To improve drivability and the sight distance, the new bridge alignment will be curved with a 4 percent super-elevation. The selected alignment has a 375-foot radius (40 mile per hour design speed), with the profiles on the approaches raised to eliminate the low spots near the north and south abutments. The south approach for a 40 mph design speed is designed with a 100-foot crest vertical curve with a K factor of 20.26. The north approach 100-foot crest vertical curve (K factor 52.49) will work with a design speed of 50 mph. This configuration was chosen based on the expectation that vehicles coming from the north may be travelling faster than 40 mph (based on field observations). In addition to the vertical curve requirements, the length of the approach roadway to be reconstructed was governed by the length needed to develop the run-on/runoff for the 4% superelevation of the horizontal curve.

The 375-foot alignment shifts the alignment approximately 4 feet to the east, with the west edge of the new bridge closely matching the west edge of the existing bridge. This alignment results in 153 feet of approach roadway work for the south approach and 255 feet of approach roadway work for the north approach. This alignment would not encroach on the drainage channel located adjacent to the west side of the north approach and would require the least amount of right-of-way acquisition. In fill sections, the embankment side slopes will be 3H:1V, except behind the guard rail where it will be 2H:1V. This is in conformance with current San Joaquin County policies.

The second alternative consists of a three-span, cast-in-place, reinforced concrete slab superstructure supported on pier walls and diaphragm type abutments on 24" cast-in-drilled-hole concrete piles. The vertical design of this alignment followed the same methodology as the 375-foot alignment. In addition this design contains a 925-foot radius alignment that will shift the centerline of the bridge approximately 23 feet to the west and requires 297-feet of approach roadway work for the south approach and 261-feet of approach roadway work for the north approach. Shifting the road alignment to the west will cause the north approach roadway embankment to encroach on the existing drainage channel that parallels the west side of the north approach. This alignment would require either relocation of the drainage channel further to the west, resulting in additional right-of-way acquisition, or construction of a storm drain to convey the drainage to Bear Creek.

Each of the proposed roadway alignments will require additional permanent right-of-way to be acquired adjacent to the east side of Bollea Road in both San Joaquin and Calaveras counties to provide for the roadway fill slopes. Construction activities could include installation of cast-in-drilled-hole piles, structure demolition, excavation, and construction, roadway excavation and construction, and stream channel work. A Draft Structure Type Selection Report (Report) was prepared for the Proposed Project (MGE, 2017). Three potential foundations were evaluated: Cast-in-Drilled Hole piles, Spread Footings, and Driven Piles. Due to the potential for future scour, spread footings were not considered feasible. Driven piles (displacement, concrete, open-end steel, or H-piles) are not considered feasible at this site due to likely hard driving conditions and the inability to achieve the adequate embedment to provide structural support. Instead, Caltrans Standard 24-inch Cast-in-Drilled Hole piles will be used as bridge foundation.

1.3.1 Right-of-Way

The project site is predominantly rural and is located in Section 16 of Township 4 North, Range 9 East, as depicted on the USGS "Wallace, CA" 7.5-minute topographic quadrangle. Surrounding land ownership includes privately held parcels (Assessor's Parcel Number (APN): 02322011 and 02322012 in San Joaquin County, 48018145 and 48019045 in Calaveras County) as well as County-owned right-of-way (ROW). The existing bridge is entirely within the ROW, but ROW acquisitions would be necessary to construct the approaching roadway on either side. The location of Bollea Road within the existing right-of-way varies based on location. In Calaveras County, the road is centered within the 50-foot right-of-way. In San Joaquin County, the roadway centerline is shifted approximately 5 feet to the east. The existing location of the Bollea Road centerline is based on field surveys that located the centerline stripe of the road.

The proposed roadway alignment will require additional permanent right-of-way to be acquired to accommodate the movement of the centerline alignment and the roadway embankment resulting from raising the Bollea Road profile 0.55 feet. With the 375-foot radius alignment, the new structure will be built within the existing right-of-way, but additional permanent right-of-way will be necessary for the roadway embankment within San Joaquin County and Calaveras County. Additionally, temporary construction easements would be required for removal of the temporary creek crossing (**Appendix A**).

1.3.2 Construction Staging and Access

Surrounding land ownership includes privately held parcels and County-owned ROW. The bridge proposed for replacement is entirely within the County ROW, but project-related impacts such as construction of the temporary creek crossing, culvert removal, and nearby area, may partially occur on private land. A 0.32-acre staging area would be used during the construction and be located within the existing road bed while the detour is in place (**Appendix A**).

1.3.3 In-stream Work and Dewatering

Due to the bridge being a clear span structure, the work proposed within the channel will be limited to removal of the remnants of the old south abutment, removal of the north bridge abutments, removal of the detour, and restoration of the south bank upstream of the bridge. Removal of the detour will include restoration of the north and south banks to their pre-project condition. The restoration of the south bank that sloughed in the storms of 2017 could include benching and compacting earth fill to restore the bank geometry and the installation of revetment to counteract future erosion. Alternatives to rock slope protection will be evaluated during project design.

The expected period of construction for all work outside of Bear Creek is proposed to be between May 1 and October 31. In-stream work is anticipated to be conducted during the dry season, defined as between June 15 and October 31, or the first significant rainfall, whichever comes first. This period coincides with the time of year when Bear Creek has little to no flow. Dewatering may be required during removal and installation of the support structure. Dewatering may also be required during installation of the abutment piles if groundwater is encountered. Water produced during dewatering activities would be pumped, treated, and discharged according to state and regional permits and regulations. During in-water work, all best management practices (BMPs) would be used to reduce the amount of sediment and debris that may be produced and avoid or minimize impacts to fish, flora and wildlife.

1.4 APPROACH TO NATURAL ENVIRONMENTAL STUDY (NES)

The purpose of the NES is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, addressing any potential issues which could be present on the site. This NES also includes a discussion of the regulatory framework with respect to listed species and or habitats of special concern within the physical setting of the project site and vicinity, and data on surface water and issues such as wetlands or flood plains within the project site. This NES will identify any potentially significant impacts that could occur from construction of the Proposed Project and where warranted makes recommendations to minimize identified impacts to species or habitats as warranted.

1.5 PROJECT WORK LIMITS

The existing bridge structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for FHWA by Caltrans. The Proposed Project includes the removal of the existing bridge to accommodate a replacement structure measuring 67-foot long by 20-foot wide (clear width). The new structure would be composed of two 10-foot-wide traffic lanes and two 2-foot-wide shoulders and would shift the bridge approximately 4 feet to the east under the preferred alternative. In addition, the new structure would include minor grading, depending on in-field and final designs. Staging areas will be located within existing paved roadways.

Traffic will be maintained during the Proposed Project through the continued use of a temporary creek crossing upstream of the existing bridge. The temporary creek crossing was installed under an emergency permit (see **Appendix E** for background) and consists of four pipes, three 48-inches in diameter and one 36-inches, surrounded by gravel and topped with Class 2 aggregate base. The crossing is located approximately 15 feet east of the existing bridge and connects Bollea Road on either side of the creek.

During construction, work hours shall be limited to 6:00 a.m. to 9:00 p.m. to comply with the San Joaquin County Development Title (Section 9-1025.9). This title specifically exempts construction-related noise impacts associated with the maintenance of public utilities if activities are conducted during daytime hours (6 a.m. to 9 p.m.).

1.6 CONSTRUCTION WINDOW

The expected period of construction is proposed to be between May 1 and October 31 to coincide with the time of year when Bear Creek has little to no flow. In-water work during the lowest or no flow periods to the degree feasible within that timeframe.

Removal of the existing temporary bypass road shall occur as part of the construction process, and will occur after the new bridge is capable of supporting vehicles. The gravel road base and associate culverts will be extracted from Bear Creek, and the stream channel will be restored to its pre-emergency bypass road conditions.

2.0 STUDY METHODS

On March 8, 2017, Analytical Environmental Services (AES) biologist David Moldoff conducted a biological survey and a focused bloom period survey at the project site (hereafter referred to as Biological Study Area (BSA)) to identify any jurisdictional wetlands or Waters of the United States (U.S.) and assess the site for the presence of state-listed or federally-listed plant and animal species. The potential need for other state or federal permits that may be required for the Proposed Project was also assessed during the site visit. A follow-up focused bloom period survey was conducted on July 20, 2017 by Nick Bonzey and Sam Schoevaars of AES to identify potentially blooming special-status plant species within the BSA. The project boundary was determined using information provided by the County to delineate the maximum area of direct or possible indirect impact associated with the Proposed Project.

Biological surveys were conducted by walking transects across the BSA and visually observing adjacent areas. Plants were identified to the extent possible given conditions at the time of the survey. The site was surveyed for potential habitat of state-listed and federally-listed species, as well as any animals found to be present.

A delineation of Waters of the U.S. was also conducted during the site visit and can be found in **Appendix D**. The information presented in this report was prepared in accordance with the United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987); the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Arid West Region Supplement) (USACE, 2008a); Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (USACE, 2016); the United States Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook (USACE and EPA, 2007); and the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). The boundaries of Waters of the U.S. were delineated through standard field methodologies outlined in A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States (USACE, 2008b).

2.1 REGULATORY REQUIREMENTS

Because of the potential to affect Waters of the U.S. during construction of the Proposed Project, various state and federal approvals may be necessary for the completion of this project. Permits include a Section 404 Nationwide Permit from the USACE, a Regional Water Quality Control Board (RWQCB) Section 401 Water Quality Certification, a Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW), and a National Pollutant Discharge Elimination System (NPDES) General Permit from the State Water Resources Control Board (SWRCB). Additionally, the federal Endangered Species Act (FESA) and the federal Migratory Bird Treaty Act of 1918 (MBTA) could influence the potential permitting for this project.

2.1.1 Federal Regulatory Requirements

Waters of the U.S.

The USACE has primary federal responsibility for administering regulations that concern Waters of the U.S. (including wetlands) under Section 404 of the Clean Water Act (CWA). Section 404 of the CWA regulates the discharge of dredged or fill material into Waters of the U.S. The term discharge of dredged material refers to the addition of dredged material, including redeposit of dredged material other than incidental fallback, into Waters of the U.S. The term includes any addition, including redeposit other than incidental fallback, of dredged material, including excavated material, into Waters of the U.S., which is incidental to any activity, including mechanized land clearing, ditching, channelization, or other excavation (Title 40).

Section 401 of the CWA regulates discharges into navigable waters as a result of a federally permitted project. This section requires that the applicant acquire a Water Quality Certification, which the Regional Water Quality Control Boards (RWQCB) has been delegated authority in California by the Environmental Protection Agency (EPA). If a project proposes to develop or operate and may result in a discharge to U.S. surface waters and/or “waters of the state” including wetlands (all types) year round and seasonal

streams, lakes, and all other surface waters, a permit would be required. At minimum, any beneficial uses lost must be replaced by a mitigation project of at least equal function, value, and area. The California Water Code, Section 13260, regulates the discharge, including dredge/fill, which could affect the quality of the waters of the state.

Federal agencies have primary responsibility for administering regulations that concern Executive Order (EO) 11990, Protection of Wetlands of 1977. The purpose of Executive Order (EO) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to:

- Acquisition, management, and disposition of Federal lands and facilities construction and improvement projects which are undertaken, financed or assisted by federal agencies; and
- Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

The procedures require the determination of whether or not the Proposed Project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments.

Federal agencies also have primary responsibility for administering regulations that concern Executive Order (EO) 13112, Invasive Species of 1999. The purpose of Executive Order (EO) 13112 is "to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause." To meet these objectives, the Order requires federal agencies, whose actions may affect the status of invasive species, to identify such actions; and subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to:

- Prevent the introduction of invasive species.
- Detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner.
- Monitor invasive species populations accurately and reliably.
- Provide for restoration of native species and habitat conditions in ecosystems that have been invaded.
- Conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species.
- Promote public education on invasive species and the means to address them.

Federal Agencies shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Federal agencies shall pursue the duties set forth in this EO in consultation with the Invasive Species Council, established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency; consistent with the Invasive Species Management Plan, which shall detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species; in cooperation with stakeholders, as appropriate; and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Federal Endangered Species Act

The United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have federal responsibility for administering regulations that concern the FESA of 1973 (16 United States Code (USC) Section 1531 et seq.). Under the FESA, federally-listed threatened and endangered species and their habitats (50 CFR Subsection 17.11, 17.12) are protected from “take” (i.e., activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect), as well as any attempt to engage in any such conduct, unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with incidental take provisions are rendered from the USFWS and or NOAA Fisheries (NMFS). Pursuant to the requirements of the FESA, an agency reviewing a Proposed Project within its jurisdiction must determine whether any federally-listed species may be present within the Proposed Project site and vicinity and determine whether the Proposed Project will result in “take” of such species.

Under the FESA, habitat loss is considered to be an impact to species. The agency is required to determine whether the Proposed Project is likely to jeopardize the continued existence of any species proposed to be listed under the FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered important to the FESA analysis and could require mitigation.

Under the FESA, the Secretary of the Interior or Commerce may designate critical habitat for any listed species. The term “critical habitat” for a threatened or endangered species refers to specific areas within the geographical range of the species at the time it is listed that contain suitable habitat for such species, which may require special management considerations or protection. The term “critical habitat” also refers to specific areas outside the geographical range of such species at the time it is listed that contain suitable habitat for such species and is determined to be essential for the conservation or recovery of such species. Under Section 7 of the FESA, all federal agencies (including the USFWS and NMFS) are required to “...ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.” (FESA section 7(a)(2)).

Migratory Bird Treaty Act

Migratory birds are protected under the MBTA of 1918 (16 USC 703-711). Under the MBTA, it is unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including

feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbances that cause nest abandonment, nestling abandonment, or forced fledging, is considered “take” under federal law. Project-related disturbances must be reduced or eliminated during the nesting season, which generally extends from February through September, though it may be refined based on the number, types, and location of migratory bird species found to be present on a property. Implementation of mitigation measures, such as having a biological monitor on-site or conducting preconstruction surveys, may further increase the construction time frame and geographic extent of a Proposed Project.

2.1.2 State Regulatory Requirements

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of state-listed threatened and endangered species. Under the CESA, state agencies are required to consult with CDFW, who is responsible for maintaining a list of rare, threatened, and endangered species designated under state law (California Fish and Game Code 2070-2079), when preparing CEQA documents. The CDFW also maintains lists of candidate species, species of special concern, and fully protected species. Candidate species are taxa formally recognized by the CDFW and under review for addition to the state threatened and endangered list. Species of special concern are taxa considered sensitive; this list serves as a “watch list.” Plant or wildlife species on the California list of species of concern (CSC) as defined by CDFW, plant species on lists 1A, 1B, and 2 of the California Native Plant Society (CNPS), and active raptor nests are included in this classification. The CEQA Guidelines (Section 15380) also provides that a plant or animal may be treated as rare or endangered even if it has not been placed on an official list provided that it meets the criteria for listing.

Pursuant to the requirements of the CESA, agencies reviewing Proposed Projects within their jurisdictions must determine whether any state-listed species have the potential to occur within a Proposed Project site and if the Proposed Project would have any impacts upon such species. Project-related impacts to species on the CESA’s rare, threatened, and endangered list would be considered significant and require mitigation. CDFW can authorize “take” if an incidental take permit is issued by the Secretary of the Interior or Commerce in compliance with the FESA or if the director of CDFW issues a permit under Section 2080 in those cases where it is demonstrated that the impacts are minimized and mitigated.

California Environmental Quality Act

Section 15380(b) of the CEQA Guidelines states that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species meets certain additional specified criteria. Section 15380 defines endangered plant, fish, or wildlife species as those whose survival and reproduction in the wild are in immediate jeopardy and rare species as those who are in such low numbers that they could become endangered if their environment worsens.

A Proposed Project will be considered to have a significant effect on the environment if it will substantially affect a rare or endangered species or the habitat of the species. The significance of impacts on a species under CEQA must be based on analyzing actual rarity and threat of extinction despite legal status or lack thereof.

California Fish and Game Code

Under Sections 1600-1616, the CDFW regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. It derives this jurisdiction under the CESA because CDFW is responsible for the protection of fish and wildlife resources and their habitats (including wetlands). CDFW provides comments on USACE Sections 404 and 401 permits under the Fish and Wildlife Coordination Act, last amended in 1995. CDFW is authorized under the California Fish and Game Code Sections 1600-1616 to develop mitigation measures and to enter into Lake and Streambed Alteration Agreements with applicants whose Proposed Projects would obstruct the flow of, or alter the bed, channel, or bank of, a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams and wetlands.

California Fish and Game Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental “take,” or needless destruction of birds, their nests, and eggs. California Fish and Game Code Section 3511 lists birds that are fully protected, defined as those that may not be taken or possessed except under a specific permit. California Fish and Game Code Section 5050 prohibits take of fully protected wildlife species except for scientific or recovery purposes. California Fish and Game Code Section 86 defines take as catch, pursue, or capture or attempt to catch, pursue, or capture.

2.2 STUDIES REQUIRED

Prior to conducting site reconnaissance surveys, the following databases were reviewed for records of special-status species, Critical Habitat (CH), Essential Fish Habitat (EFH), and sensitive plant communities near the BSA:

- A USFWS Official Species List was queried for a report of federally-listed special-status species with the potential to occur within the BSA (USFWS, 2019a; **Appendix B-1**);
- A NMFS official Endangered Species Act species list requested by Caltrans, the federal lead agency, as designated by FHWA, and San Joaquin County as the project proponent (nonfederal lead agency) (NOAA, 2019b; **Appendix B-4**);
- The California Natural Diversity Database (CNDDDB) Geographical Information System was queried for a report on all special-status species and sensitive plant communities potentially found within the Wallace quadrangle and the eight surrounding quads: Goose Creek, Lone, Jackson, Clements, Linden, Valley Springs, Valley Springs SW, and Jenny Lind (CDFW, 2019a; **Appendix B-2**);
- The CNPS *Electronic Inventory of Rare and Endangered Plants*, was queried for special-status plant species known to occur within the Wallace quadrangle and the eight surrounding quads (CNPS, 2019; **Appendix B-3**);
- Aerial photographs of the BSA were also examined for potential habitat types (Figures 3 in **Appendix A**); and
- Mapping of listed CH (USFWS, 2019b), EFH Mapper (NOAA 2019a) and CDFW list of the Barriers to Fish Passage (CDFW, 2019b) were reviewed.

2.3 PERSONNEL AND SURVEY DATES

A site visit was conducted on March 8, 2017 by AES biologist David Moldoff with the goal of characterizing the vegetative communities and habitat types and conducting a delineation of the wetlands and other Waters of the U.S. and a focused bloom period survey within the BSA. Mr. Moldoff holds a Bachelor of Science degree in Ecology and Evolutionary Biology from the University of California, Santa Cruz and a Master of Science in Biology from the University of Kentucky. He is a state certified Environmental Scientist, Environmental Planner, and Research Analyst II and has more than 8 years of experience working on environmental projects throughout the United States and performing habitat assessments, special-status species surveys, and wetland delineations. He serves as a biologist at AES and is involved in preparing environmental documents for a variety of clients, including local, State, federal, and tribal agencies.

A follow on focused bloom period survey was conducted on July 20, 2017 by Nick Bonzey and Sam Schoevaars of AES to identify special-status plant species within the BSA. Mr. Bonzey holds a Bachelor of Science degree in Ecology and Environmental Science from the University of Maine. He is a Certified Professional in Erosion and Sediment Control (CPESC #7286), a Qualified Stormwater Pollution Prevention Plan developer in California (QSD #24037), and holds USFWS Federal 10(a)(1)(A) Permit: TE74630A (vernal pool branchiopods). He has more than 12 years of experience in environmental consulting working with federal environmental research facilities, specializing in wetland delineations, special-status species surveys, and habitat assessments, including 8 years of experience delineating wetlands within the Arid West region. He serves as the senior biologist at AES and is involved in preparing environmental documents for a variety of clients, including local, state, federal, and tribal agencies. Mr. Schoevaars holds a Bachelor of Science in Environmental Science and Management from the University of California, Davis. He has his Basic Wetland Delineation certification from the Wetland Training Institute and has more than 5 years of experience working on environmental projects and in academic research. He serves as an environmental analyst at AES and is involved in preparing environmental documents for a variety of clients, including local, State, federal, and tribal agencies.

2.4 LIMITATIONS THAT MAY INFLUENCE RESULTS

The temporary bypass was first constructed before biological site visits were conducted, as seen in Figure 3 of **Appendix A**. Due to the timing of the preliminary site visits, the condition of the stream and adjacent uplands under the temporary bypass road is impossible to fully evaluate. However the upstream and downstream reaches of stream were assessed to provide a basis for evaluating the likely condition of the impacted reach of stream for restoration baseline. During the biological evaluation, conditions were evaluated “as is.”

Multiple site visits were conducted to ensure that all of the special-status plant species identified in the USFWS, CNDDDB, and CNPS lists were within their bloom period during the time of the surveys. No other limitations were identified which may influence stated results.

2.5 COORDINATION WITH AGENCIES

No direct coordination with permitting agencies has been done by AES regarding the permanent bridge construction. Prior to construction of the temporary bypass road, San Joaquin County coordinated with the Federal Emergency Management Agency (FEMA) to receive reimbursement for the emergency project in September of 2016, and the application for reimbursement was approved in August of 2018. (**Appendix F**).

3.0 ENVIRONMENTAL SETTING

The BSA is located in the Sierra Nevada foothills (Class IV United States Environmental Protection Agency [USEPA] ecoregion – Region 6d) (Griffith et al., 2016), west of the Community of Wallace in eastern San Joaquin County and western Calaveras County, California. It is located on County ROW and private land immediately adjacent to Bear Creek, which is in the Lower Bear Creek watershed. Bollea Road is a paved local County road that ends approximately 1,500 feet south of the BSA and serves approximately 10 residential parcels. The adjacent habitats are relatively undeveloped and consist of ruderal grassland, riparian, riverine (Bear Creek), lacustrine, a topographic depression, and ruderal/disturbed habitats. Soils in the BSA are typical of the region and consist predominately of sandy loam.

3.1 DESCRIPTION OF EXISTING BIOLOGICAL AND PHYSICAL CONDITIONS

3.1.1 Study Area

The BSA encompasses the areas of direct project-related impacts, as defined by the County, as well as areas that could reasonably be anticipated to be affected as a result of project-related direct or indirect activities. This limit of disturbance extends to 50 feet beyond any foreseen permanent impacts. The disturbance limits was calculated by the county in the Area of Potential Effects map. The total area of this study area is 4.434 acres. There are 2.522 acres of ruderal grassland habitat, 0.445 acres of riparian habitat, 1.09 acres of ruderal/disturbed habitat, 0.102 acres of riverine (Bear Creek), 0.22 acres of lacustrine habitat, 0.021 acres of topographic depression, and 0.034 acres of drainage ditches. See Figure 4 in **Appendix A** for habitats within the BSA, and **Table 1** (below) for a summary of habitats within the BSA. Representative site photographs can be seen in Figure 7 of **Appendix A**.

Surrounding land ownership includes privately held parcels and County-owned ROW. The bridge proposed for replacement is entirely within the County ROW, but project-related impacts such as grading could partially occur on private land. An aerial photograph of the project area can be seen in Figure 3 in **Appendix A**.

3.1.2 Physical Conditions

The area immediately surrounding the BSA consists of ruderal grassland, riparian and ruderal/disturbed terrestrial habitats. Bear Creek, a perennial tributary of the Delta, flows east-west through the BSA. A topographical map of the surrounding area can be seen in Figure 2 in **Appendix A**. Elevations in the BSA range from 54 to 82 meters above sea level.

3.1.3 Biological Conditions in the Biological Study Area

The biological conditions in the BSA are typical of those in the region. Habitat communities in the BSA include ruderal grassland, drainage ditches, riparian, riverine (Bear Creek), lacustrine, a topographic depression, and ruderal/disturbed (Figure 4 in **Appendix A**). A complete list of vascular plant species observed within the study area can be found in **Appendix C**. Total acreages of each habitat community within the BSA are shown in **Table 1** below.

TABLE 1.
HABITAT COMMUNITIES

Habitat Community	Acreage
Ruderal Grassland	2.522
Riparian	0.445
Ruderal/Disturbed	1.090
Riverine	0.102
Lacustrine	0.220
Topographic Depression	0.021
Drainage Ditch	0.034

Ruderal Grassland

The ruderal grassland plant community is found in several patches within BSA, totaling 2.522 acres. The biological survey occurred outside of the primary blooming period for many species and as a result, identification to the lowest taxonomic level was not always possible. Species typical of this habitat type included; slender wild oat (*Avena barbata*), wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), foxtail chess (*Bromus madritensis ssp. madritensis*), clarkia (*Clarkia sp.*), orchard grass (*Dactylis glomerata*), wild hyacinth (*Dichelostemma capitatum*), blue wildrye (*Elymus glaucus*), red-stemmed filaree (*Erodium cicutarium*), meadow barley (*Hordeum brachyantherum*), barley (*Hordeum marinum*), smooth cats ear (*Hypochaeris glabra*), wild geranium (*Geranium dissectum*), Douglas' microseris (*Microseris douglasii*), prickly sow thistle (*Sonchus asper*), chickweed (*Stellaria media*), vetch (*Vicia villosa*). A flock of wild turkeys (*Meleagris gallopavo*) were observed in this habitat during biological site surveys. No other animals were observed within this habitat.

Drainage Ditches

Drainage ditches are present throughout the BSA in and adjacent to the ruderal grasslands. The drainage ditches are fully vegetated with grassland species and are included as Ruderal Grassland plant community (Habitat Type), since they do not create a distinct habitat. These non-jurisdictional features show no evidence of running water and appear to have been created wholly out of uplands for purposes of draining the adjacent agricultural fields. These drainages, shown in Figure 4 in **Appendix A**, drain to the south towards Bear Creek. There is no direct hydrological connection between these ditches and the pond on the east side of Bollea Rd. The ditch on the west side of Bollea Rd. connects to Bear Creek above the OHWM. The other ditches shown in Figure 4 flow into this ditch through a series of culverts under Bollea Rd. All of the ditches shown in Figure 4 are covered in dense grassland vegetation, and are all approximately 2 feet across from the top of bank to top of bank. These features total 748 linear feet within the BSA, with an area of approximately occupy approximately 0.034 acres. No water was

observed in these features, and no evidence of historically flowing water was observed within these features. No soil, vegetation, or hydrology features consistent with wetlands or other waters of the U.S. were observed within these features.

Riparian

Riparian habitat is found along either side of Bear Creek predominately consists of densely clumped oaks (*Quercus ssp.*), totaling 0.445 acres. A separate riparian habitat is found in the northwestern portion of the BSA and is dominated by willows (*Salix ssp.*), oaks, and bare ground. One migratory bird species of concern, discussed in **Section 3.2**, has the potential to use this habitat: *Buteo swainsoni*. No animals were observed in this habitat during biological site surveys.

Ruderal/Disturbed

Ruderal/Disturbed habitat occurs over 1.09 acres within the BSA. This habitat is primarily paved roadways, gravel access roads, and driveways. Included in this habitat is the temporary bypass road, a gravel and dirt fill road constructed over Bear Creek to allow access to the residents of Bollea Road while the bridge was repaired. This habitat is unvegetated and regularly maintained to allow for vehicle access.

Riverine (Bear Creek)

Bear Creek, a USGS blue-line perennial stream occupying 0.102 acres within the BSA, passes through the BSA and generally flows from east to west. A USGS blue-line stream is a water course identified by the USGS as being jurisdictional and was investigated during preliminary environmental studies. The OHWM of the stream was delineated based on a drastic change in terrestrial vegetation, sorted coarse substrate, and undercut banks, all indicators of the regular presence of moving water within a riverine system. Within the stream channel, the bed consisted of silt and sand with dispersed cobble. Terrestrial vegetation was absent from the channel, except for small amounts of algal mats downstream of the bridge. Historic aerial imagery and the presence of benthic macroinvertebrates were used to classify the stream as perennial, in addition to water being present within the stream channel during the March 8, 2017 site visit. Some water was also present during the July site visit. The standing water was found on both the east and west side of the bridge during the July visit. The depths of the standing water averaged approximately 1.5 feet. Review of historic aerial imagery shows this reach of Bear Creek as mostly dry with some standing water between the months of August and February. The standing water observed during the months of August through February did not show connectivity to other reaches of the creek. No fish were observed within the habitat during site surveys, and evidence of bats living in the joints of the bridge above the creek was observed by sound and smell. A preliminary delineation of waters of the U.S. is included in **Appendix D**.

Lacustrine

An approximately 0.217 acre man-made pond is fenced within private property in the northeastern portion of the BSA. It has raised berms on all sides with overflow culverts that spill into the roadside ditches. Vegetation is dominated by large willows (*Salix ssp.*) and a clear OHWM was observed. This habitat could not be directly accessed due to a fence completely surrounding the feature. This pond is within the BSA but will not be impacted by the Proposed Project.

Topographic Depression

An approximately 0.021 acre topographic depression, with obvious wetland vegetation, was evaluated for the three parameters required to be considered a wetland (USACE 2008a). Although the herbaceous was determined to be hydrophytic vegetation and wetland hydrology is present (observable surface water), an investigation of the soils revealed that it did not meet any of the hydric soil indicators for the Arid West Region and therefore do not meet the requirements for a wetland under the three-parameter wetland approach by the USACE (**Appendix D**). This topographic depression is not impacted by the Proposed Project.

3.2 REGIONAL SPECIES, HABITATS, AND NATURAL COMMUNITIES OF CONCERN

A list was compiled of the special-status (federally and state listed) species present in the region, as determined by the studies listed in **Section 2.2**. A review of USFWS CH and NOAA EFH within a 5 mile radius was also evaluated. These species were analyzed for their potential to occur within the BSA, as shown in **Table 2** below. Of the species with potential to occur in the area as a whole, only one plant, two amphibians, two fish, and one reptile have the potential to occur within the BSA.

Migratory birds and other birds of prey, protected under the MBTA (50 CFR 10), have the potential to nest in the trees, shrubs, and grassland within the ruderal grassland, riparian, ruderal/disturbed habitats, and beneath the Bollea Road Bridge. During the March 8, 2017 site survey, a red-shouldered hawk (*Buteo lineatus*) appeared to be defending a nest located in the riparian habitat separate from the creek. Swallows (*Hirundinidae ssp.*) were also present and previous signs of nesting under the Bollea Bridge were apparent.

4.0 RESULTS: IMPACTS AND MITIGATION

4.1 HABITATS AND NATURAL COMMUNITIES OF SPECIAL CONCERN

Only seven distinct habitats are present in the BSA (Figure 4 in **Appendix A**): ruderal grassland, riparian, ruderal/disturbed, riverine (Bear Creek), lacustrine, a topographic depression, and drainage ditch. None of these habitats have statewide or regionally limited distribution. Nevertheless, native habitats will be avoided to the extent possible and post-construction restoration will occur to restore these temporary impacts to a functionally equivalent preconstruction state. **Table 3** summarizes temporary and permanent impacts to habitats within the BSA, and Figures 5 and 6 in **Appendix A** show the temporary and permanent impacts under both alternatives.

Within the BSA, approximately 0.102 acres (130 linear feet) of riverine (Bear Creek) habitat and 0.22 acres of the lacustrine habitat is likely to be considered jurisdictional by the USACE. Of this 0.324 acres, the removal of the temporary stream crossing and construction of the new bridge is likely to permanently impact 0.004 acres of jurisdictional stream through the end of construction under the preferred alternative, and a total of 0.014 acres of permanent impacts under Alternative 1 (see **Table 3**). This is discussed in more detail below.

TABLE 2.
LISTED OR PROPOSED SPECIES, NATURAL COMMUNITIES, AND CRITICAL HABITAT
POTENTIALLY OCCURRING OR KNOWN TO OCCUR IN THE PROJECT AREA

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR	RATIONALE
PLANTS					
lone manzanita	<i>Arctostaphylos myrtifolia</i>	FT/--/1B.2	Found in clay or sandy acidic, lone soil in chaparral and cismontane woodlands at elevations of 60-580 meters	Habitat Present	The species was not observed during the site survey, which was conducted during the bloom season for this species.
big-scale balsamroot	<i>Balsamorhiza macrolepis</i>	--/--/1B.2	Found in serpentinite soils in Chaparral, cismontane woodlands, and valley and foothill grasslands at elevations of 90-1555 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.
Hoover's calycadenia	<i>Calycadenia hooveri</i>	--/--/1B.3	Found in cismontane woodlands and in valley and foothill grasslands on rocky substrate at elevations of 65-300 meters.	Habitat Present	The species was not observed during the site survey, conducted during the bloom season for this species.
dwarf downingia	<i>Downingia pusilla</i>	--/--/2B.2	Found in valley and foothill grassland (mesic) and vernal pools at elevations of 1-445 meters.	No	The project site does not provide suitable habitat for this species.
lone buckwheat	<i>Eriogonum apricum</i> var. apricum	FE/CE/1B.1	Found in chaparral openings in lone soil at elevations of 60-145 meters.	No	The species has been extirpated in the area of the project site, and no suitable habitat for this species exists within the project site.
Tuolumne button-celery	<i>Eryngium pinnatisectum</i>	--/--/1B.2	Found in cismontane woodlands, lower montane coniferous forest, and vernal pools with mesic soils at elevations of 70-915 meters.	No	The project site does not provide suitable habitat for this species.
Delta button-celery	<i>Eryngium racemosum</i>	--/CE/1B.1	Found in riparian scrub in vernal mesic clay depressions at elevations of 3-30 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.
Sacramento Orcutt grass	<i>Orcuttia viscida</i>	FE/CE/1B.1	Found in vernal pools at elevations of 30-100 meters.	No	The project site does not provide suitable habitat for this species.
Patterson's navarretia	<i>Navarretia paradoxiclora</i>	--/--/1B.3	Found in serpentinite soils, openings, vernal mesic areas. Often found in drainages and meadows and seeps at elevations of 150-430 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.
prairie wedge grass	<i>Sphenopholis obtusata</i>	--/--/2B.2	Found in mesic soils in Cismontane woodlands and Meadows and seeps at elevations of 300-2000 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.
Jepson's coyote thistle	<i>Eryngium jepsonii</i>	--/--/1B.2	Found in clay vernal pools, and valley and foothill grasslands at elevations of 3-300 meters.	No	The project site does not provide suitable habitat for this species.
Stanislaus monkeyflower	<i>Erythranthe marmorata</i>	--/--/1B.1	Found in cismontane woodlands and lower montane coniferous forests at elevations of 100-900 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR	RATIONALE
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	--/CE/1B.2	Found in clay soils in vernal pools and along the lake margins of marshes and swamps at elevations of 10-2375 meters.	No	The project site does not provide suitable habitat for this species.
Parry's horkelia	<i>Horkelia parryi</i>	--/--/1B.2	Found in lone formation and other soils in chaparral and cismontane woodlands at elevations of 80-1070 meters.	No	The project site does not provide suitable habitat for this species due to elevation requirements.
Ahart's dwarf rush	<i>Juncus leiospermus</i> var. <i>ahartii</i>	--/--/1B.2	Found in valley and foothill grasslands on mesic substrates at elevations of 30-299 meters.	Habitat Present	The species was not observed during the site survey, which was conducted during the bloom season for this species.
legenere	<i>Legenere limosa</i>	--/--/1B.1	Found in vernal pools at elevations of 1-880 meters.	No	The project site does not provide suitable habitat for this species.
pincushion navarretia	<i>Navarretia myersii</i> ssp. <i>myersii</i>	--/--/1B.1	Found in vernal pools that are often acidic, at elevations of 20-330 meters.	No	The project site does not provide suitable habitat for this species.
ANIMALS					
Amphibians					
California tiger salamander	<i>Ambystoma californiense</i>	FT/CT/WL	Found in vernal pools, ephemeral wetlands, and seasonal ponds, including constructed stock ponds, in grassland and oak savannah plant communities at elevations of 0-460 meters.	Habitat Present	The project site provides low-quality upland estivation habitat in the ruderal/grassland habitats within the BSA.
California red-legged frog	<i>Rana draytonii</i>	FT /CT/CSC	Found in permanent and temporary pools of streams, marshes, and ponds with dense grassy and/or shrubby vegetation at elevations of 0-1160 meters.	Habitat Present	The BSA contains potentially suitable breeding habitat within the pond but the closest sighting is over 5 miles away.
western spadefoot	<i>Spea hammondi</i>	--/CSC/--	Found in temporary pools, ephemeral wetlands, and seasonal ponds in valley and foothill grassland, open chaparral, and pine-oak woodland communities at elevations of 0-1200 meters.	No	The project site does not provide suitable habitat for this species.
Birds					
tricolored blackbird	<i>Agelaius tricolor</i>	--/CT/CSC	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	No	The project site does not contain suitable nesting habitat.
golden eagle	<i>Aquila chrysaetos</i>	--/--/FP	Found in open country, in prairies, arctic and alpine tundra, open wooded country, and barren areas, especially in hilly or mountainous regions.	No	The project site does not contain suitable nesting habitat.
burrowing owl	<i>Athene cunicularia</i>	--/CSC/--	A yearlong resident of open, dry grassland and desert habitats, as well as in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats.	No	The project site does not contain suitable nesting habitat.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR	RATIONALE
bank swallow	<i>Riparia riparia</i>	--/CT/--	A colonial nester; nests primarily in riparian scrub, riparian woodland, and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, and the ocean to dig nesting holes.	No	The project site does not contain suitable nesting habitat.
Swainson's hawk	<i>Buteo swainsoni</i>	--/CT/--	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations.	Habitat Present	The project site may contain suitable habitat in the riparian areas. However no raptor nests were identified within 500 feet of the BSA.
bald eagle	<i>Haliaeetus leucocephalus</i>	Delisted/CE/FP	Found near ocean shorelines, lakes, reservoirs, river systems, and coastal wetlands. Usually less than 2 km to water that offers foraging opportunities. Suitable foraging habitat consists of large bodies of water or rivers with abundant fish and adjacent perching sites such as snags or large trees.	No	The project site does not contain suitable nesting habitat.
yellow-breasted chat	<i>Icteria virens</i>	-/CSC/-	Nests in dense riparian habitats. Typical N CA habitats include valley foothill hardwood and valley foothill hardwood-conifer.	No	The project site does not contain suitable habitat.
Fish					
hardhead	<i>Mylopharodon conocephalus</i>	--/CSC/--	Requires deep, rocky, and sandy pools of small to large rivers.	Habitat Present	Bear Creek may provide low-quality habitat at certain times of year for this species within the BSA.
steelhead - Central Valley distinct population segment	<i>Oncorhynchus mykiss irideus</i>	FT/--/--	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	No	Habitat for CV Steelhead is unavailable due to multiple fish barriers downstream of the BSA and lack of flowing water during majority of the year. Further discussion is provided in Chapter 4.3.2.
Delta smelt	<i>Hypomesus transpacificus</i>	FT/CT/--	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	No	Not within the known or historic range for this species.
Invertebrates					
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT/--/--	Found in vernal pools and seasonal wetlands that fill with water during fall and winter rains and dry up in the spring and summer. Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary. Need to inhabit areas that are free of predators.	No	The project site does not contain wetlands or vernal pools.
valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT/--/--	Found in riparian forest communities. Exclusive host plant is elderberry (<i>Sambucus</i> species), which must have stems \geq 1-inch diameter for the beetle.	Habitat Present	Two elderberry shrubs were observed within the BSA. Riparian and upland habitat within or adjacent to the BSA contains potential suitable habitat.

COMMON NAME	SCIENTIFIC NAME	LISTING STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR	RATIONALE
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE/--/--	The life cycle is within vernal pools and valley foothill grassland swales.	No	The project site does not contain wetlands or vernal pools.
Reptiles					
western pond turtle	<i>Emys marmorata</i>	--/CSC/--	Inhabits rivers, streams, lakes, ponds, reservoirs, stock ponds, and permanent and ephemeral wetland habitats.	Habitat Present	Suitable habitat occurs in the pond within the BSA.
giant garter snake	<i>Thamnophis gigas</i>	FT/CT/--	Inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands. Requires adequate water during its active season (early spring through mid-fall) to provide food and cover, emergent, herbaceous wetland vegetation for foraging and cover, grassy banks and openings in waterside vegetation for basking, and higher elevation uplands for cover and refuge from flood waters during its dormant season (winter). Inhabits small mammal burrows and other soil crevices with sunny exposure along south and west facing slopes, above prevailing flood elevations when dormant.	No	The project site does not contain suitable habitat. The nearest occurrences are located more than 10 miles away from the project site in various drainage canals and waterways near the San Joaquin Delta.
Critical Habitat / Essential Fish Habitat					
Chinook EFH	<i>Oncorhynchus tshawytscha</i>	EFH/--/--	Essential Fish Habitat (EFH) for Chinook salmon is designated within the action area. EFH for Pacific salmon covered under the Pacific Coast Salmon Fisheries Management Plan administered through the MSA.	Habitat Present	Although EFH has been designated on the NOAA Fisheries list for the "Wallace, CA" 7.5-minute topographic quadrangle, the portion of the Bear Creek within the BSA lacks the important elements (HAPCs) that comprise EFH.
Source: CDFW, 2019a; CNPS, 2019; USFWS, 2019a; USFWS, 2019b; NOAA 2019a; NOAA 2019b (Appendix B) Federal: United States Fish and Wildlife Service FE – Federally Endangered FT – Federally Threatened FD – Federally Delisted FC – Federal Candidate for Listing CH – Critical Habitat Federal: National Marine Fisheries Service EFH – Essential Fish Habitat			State: California Department of Fish and Game CE – California Listed Endangered CR – California Rare CT – California Listed Threatened CCE – California Candidate Endangered CCT – California Candidate Threatened CSC – California Species of Special Concern FP – California Fully Protected Species WL – California Watch List CNPS: California Native Plant Society 1A – Plants Presumed Extinct in California 1B – Plants Rare, Threatened, or Endangered in California and elsewhere 2 – Plants Rare, Threatened, or Endangered in California but more common elsewhere 3 – Plants about Which More Information is Needed – A Review List 4 – Plants of Limited Distribution – A Watch List		

TABLE 3.
SUMMARY OF TEMPORARY AND PERMANENT EFFECTS BY HABITAT TYPE

	Preferred Alternative (375-foot curve)		Alternative 1 (925-foot curve)	
Habitat Type	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)
Ruderal Grassland	0.007	0.014	0.057	0.090
Riparian	0.002	0.008	0.041	0.036
Ruderal/Disturbed	0.382	0.065	0.443	0.031
Riverine	0.004	0.007	0.014	0.042
Lacustrine	0.000	0.000	0.000	0.000
Topographic Depression	0.000	0.000	0.000	0.000
Drainage Ditches	0.00001	0.00004	0.008	0.003
Total	0.395	0.094	0.563	0.202

Perennial Stream Natural Community

4.1.1 Survey Results

The perennial stream in the BSA has been identified as Bear Creek, a USGS blue-line stream running east-west. It is part of the Lower Bear Creek watershed and is spanned by the Bollea Road Bridge, the subject of the Proposed Project. During the March 8, 2017 and July 20, 2017 site visits, flowing water was present in the stream. There was evidence that the stream is inundated constantly, including the presence of algal mats, an ordinary high water mark (OHWM), a bed and bank with sorted substrates, an absence of terrestrial vegetation, and the presence of benthic macroinvertebrates within the stream channel. The main channel of Bear Creek is, at its widest, 33.75 feet at a depth of 3 feet to the OHWM.

4.1.2 Project Impacts

Proposed Project designs include 0.004 acres of permanent impacts and 0.007 acres of temporary impact to riverine (Bear Creek) habitat under the preferred alternative. The Proposed Project is not expected to impact, based on design plans, the lacustrine habitat, or the topographic depression. It is anticipated that the Proposed Project will require a CDFW Section 1602 permit, a USACE Section 404 permit, and a RWQCB Section 401 Water Quality Certification, and all applicable conditions within the permits shall be adhered to.

The Proposed Project would involve removing the existing bridge and replacing it on a new footprint. Direct effects on Bear Creek would include excavation and pile drilling to construct the bridge abutments and piers, re-grading the creek banks in front of the abutments, potential deposition of debris and dust during demolition of the existing bridge, and removal of the temporary bypass. Best management practices (BMPs) would be implemented to help prevent debris and dust from entering Bear Creek. To minimize impacts to Bear Creek all construction activities shall be scheduled within the creek bed occur

during dry season, defined as the timeframe between June 15 and October 31, or the first significant rainfall, whichever comes first, when flowing water is at its minimum in Bear Creek within the project site. All conditions within the CDFW Section 1602 permit, a USACE Section 404 permit, and a RWQCB Section 401 permit shall be met. After the installation of the replacement bridge, the temporary crossing would be removed and the stream channel would be restored to its pre-project condition. The temporary impacts to the perennial stream under the current conditions would total approximately 0.007 acre and would occur only during construction. These impacts are from the removal of the temporary stream crossing, converting this current ruderal habitat (newly created road bed) back to Perennial stream habitat. This impact would be a net positive to this habitat, as the current conditions force the water from Bear Creek through a set of culverts under this temporary road, which will be removed as a part of the Proposed Project. Avoidance and minimization efforts are presented below to ensure that impacts to Bear Creek are minimized to the extent possible.

4.1.3 Avoidance and Minimization Efforts

BIO-1: Obtain All Required Permits

Prior to construction, the Proposed Project shall obtain all required permits. Permits may include, but not be limited to, the following: CDFW Section 1602 permit, a USACE Section 404 permit, and a RWQCB Section 401 permit. Coverage under a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Construction General Permit (CGP), Order 2009-009-DWQ. All conditions within the issued permits shall be adhered to.

BIO-2: Limit In-Stream Work to Dry Season

All in-stream construction activities shall be performed during the dry season, defined as the timeframe between June 15 and October 31, or the first significant rainfall, whichever comes first. This period coincides with the time of year when Bear Creek has little to no flow. The required permits are anticipated to include provisions for any required ensuring dewatering does not impact the stream, removal of fill within the stream, and sediment control during and immediately after the work.

If the work site needs to be temporarily dewatered by pumping, water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any diversion or barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate. Alternation of the stream bed will be minimized to the maximum extent possible; any imported material will be removed from the stream bed upon completion of the project.

BIO-3: Restoration of Stream Channel after Construction

Before the end of construction, any work done to the new bridge alignment within the Bear Creek stream channel and during the removal of the temporary bypass road, the stream channel shall be restored to a condition allowing for connectivity of the Ordinary High Water Mark (OHWM) and

the bed and bank between the upstream and downstream sections of the BSA. All temporarily disturbed areas shall be returned to pre-project conditions upon completion of construction, including habitat contours. These areas will be properly protected from washout and erosion using appropriate erosion control devices including coir netting, hydroseeding, and revegetation. The un-impacted areas above and below the work areas will serve as baseline for restoration evaluation.

4.1.4 Compensatory Mitigation

As permanent impacts to waters of the U.S. are less than 0.1 acre, compensatory mitigation will not be required under current USACE nationwide permit (NWP) standards for linear transportation projects (USACE NWP #14). All required State and federal permits will be obtained and adhered to. No new trees are anticipated to be removed due to the in stream work or restoration.

4.1.5 Cumulative Impacts

The FESA defines cumulative effects as those effects of future state, tribal, local, or private activities, which are reasonably certain to be conducted within the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. The cumulative setting for impacts to perennial streams is the extent of its range, primarily within the Central Valley. This habitat removal from current and future development in the area is the biggest threat to the species that utilize this habitat. The project would include replacing an existing bridge and would not contribute to development in the area or contribute to a cumulative loss in suitable habitat. Currently, there is no additional known state or private projects that are planned within the BSA. Further, no take of species associated with this habitat is anticipated and with the implementation of the project's avoidance and minimization measures the project would avoid adverse effects on the species. Therefore, the project is not expected to result in cumulatively considerable effects on perennial streams. The removal of the temporary road crossing will restore the stream to the pre-emergency work condition for a net gain in habitat from the date of the evaluations reflected in this NES.

4.2 SPECIAL-STATUS PLANT SPECIES

4.2.1 Survey Results

No special-status plant species were observed within the BSA. Furthermore, of the 17 special-status species that are listed in the USFWS Official Species List and CNDBB/CNPS lists, suitable habitat is present within the BSA for only three of the species to reasonably occur: lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush. A focused botanical survey was conducted during the evident and identifiable blooming period for each of these species on March 8, 2017 and July 20, 2017. These surveys were conducted during the bloom season for these three species, and no individuals of these species were observed. See **Table 2** for an analysis of habitat and the potential for existence of all species with the potential to occur within the region surrounding the BSA, and conclusions of presence within the disturbance area of the Proposed Project.

4.2.2 Project Impacts

With implementation of the proposed avoidance and minimization measures, the Proposed Project is not expected to result in impacts to listed plant species.

lone manzanita (*Arctostaphylos myrtifolia*)

Federal Status – Threatened

State Status – None

lone Manzanita is a perennial evergreen shrub in the heath family (Ericaceae). It grows in chaparral and cismontane woodland habitats on acidic, lone soil that is clay or sandy at elevations that range from 60 to 770 meters above mean sea level. This species blooms from November through March and has a known range isolated to Amador and Calaveras Counties (CNPS, 2018).

There is one CNDDDB record for lone manzanita within 5 miles of the BSA. Habitat within the BSA provides marginal suitable habitat for this species. No lone manzanita were observed during surveys conducted to determine its presence within the BSA. lone manzanita would not be impacted during construction activities associated with the Proposed Project. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 4.2.3** (described below), as these measures will eliminate the chance of lone manzanita being present within the construction area. With implementation of these measures, the Proposed Project *may affect but is not likely to adversely affect* lone manzanita.

4.2.3 Avoidance and Minimization Efforts

Surveys were conducted to determine the presence and/or potential for presence of special-status plant species within the BSA during the appropriate bloom season, and no special-status plant species were found to be present within the BSA. However, due to the presence of appropriate habitat for lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush, the following BMPs are recommended to reduce any unforeseeable potential impacts to a less-than-significant level in addition to the BMPs listed in **Section 4.1.3**:

BIO-4: Demarcate Work Area Boundary

In consultation with a qualified biologist, construction personnel shall demarcate the outer perimeter of the surveyed work area to prevent damage to adjacent habitat even though no suitable for special-status species were seen there during the detailed survey of the BSA. This fencing shall provide visual orientation to its limits of the work and survey cleared areas. Material appropriate for creating a barrier for animal species, such as properly installed silt fencing, shall be used, shall be installed prior to the start of construction, and shall be maintained in place and in good working order during all periods of construction. All persons employed or otherwise working on the project site shall be instructed about the restrictions that the marking represents.

BIO-5: Conduct Preconstruction Surveys for Special-Status Plant Species

To re-verify the absence of listed plants within the impact area, a qualified biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines no less than 14 days prior to initiating ground-disturbing activities for the following special-status species: lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush. If any unanticipated evidence of species presence is found during the preconstruction survey, the biologist shall contact the County within one day following the survey and contact CDFW and/or USFWS for consultation on the identified species. All requirements provided by CDFW and/or USFWS at the time of consultation shall be adhered to.

BIO-6: Conduct Environmental Awareness Training for Special-Status Species

Prior to construction commencement, all construction personnel shall participate in environmental awareness training regarding identification, descriptions, behavior and habitat indicators for all special-status species with the potential to be found within the BSA. If new construction personnel are added, they must receive the mandatory training prior to initiating work. As part of the training, an environmental awareness handout shall be distributed to all personnel that describes and illustrates all special-status animal species with the potential to occur within the BSA. In addition information on general measures that will be taken to protect these species as they relate to the Proposed Project, the penalties for non-compliance, and the boundaries of the Proposed Project site will be included. The handout shall also list any applicable permit conditions provided by each regulatory agency. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

4.2.4 Compensatory Mitigation

With mitigation, no impacts to special-status plants are anticipated. Therefore, no compensatory mitigation is necessary for special status plant species.

4.2.5 Cumulative Impacts

The FESA defines cumulative effects as those effects of future state, tribal, local, or private activities, which are reasonably certain to be conducted within the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. The cumulative setting for lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush is the extent of its range, primarily within the Central Valley. Habitat removal from current and future development in the area is the biggest threat to lone manzanita, Hoover's calycadenia, and Ahart's dwarf rush. The Proposed Project would include replacing an existing bridge and would not contribute to development in the area or contribute to a cumulative loss in suitable habitat. Currently, there is no additional known state or private projects that are planned within the BSA. Furthermore, no take of the species is anticipated and with the implementation of the avoidance and minimization measures the Proposed Project would avoid adverse

effects on the species. Therefore, the Proposed Project is not expected to result in cumulatively considerable effects on lone manzanita, Hoover's calycadenia, or Ahart's dwarf rush.

4.3 SPECIAL-STATUS ANIMAL SPECIES

4.3.1 Survey Results

Special-status species that could occur in the region are shown in **Table 2**. Of these species, the BSA contains habitat suitable for two amphibians, one bird, one fish, one invertebrate and one reptile, discussed below. The species with a potential to occur in the BSA that are contained in the USFWS Official Species List, CNDDDB report, and CNPS list, and their habitat requirements are outlined in **Table 2**.

4.3.2 Project Impacts

California tiger salamander (*Ambystoma californiense*)

Federal Status – Threatened

State Status – Threatened

California Tiger Salamanders (CTS) require suitable aquatic habitat for breeding and upland habitat for estivation (dry-season hibernation). Aquatic breeding habitats, including vernal pools and seasonal and perennial ponds, are typically found in grassland habitats and oak savannah plant communities at elevations in the range of sea level to approximately 610 meters above sea level. CTS do not breed in fast-flowing ephemeral streams because eggs or larva would be washed away or may be exposed to predation. CTS do not use permanent pools because potential for predation of eggs or larvae stages exist where more permanent waters exist. Breeding typically occurs between December and March. CTS spend most of their lives in upland habitats, which consist of grassland and oak savannah burrows of small mammals such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*). They cannot dig or maintain their own burrows and consequently require the presence of burrowing mammals for burrow construction and maintenance.

There are 14 CNDDDB records within 5 miles of the BSA, the closest non-breeding sighting of which is located 0.2 miles away. CH for this species is identified approximately 4 miles to the southeast and approximately 4 miles to the northwest. No CTS were observed within the BSA during the biological survey on March 8, 2017. Although no ground squirrel population was observed during the site survey, low-quality burrows were found in several locations in the BSA within the ruderal/grassland habitats west of Bollea Rd. Two other locations west of the BSA were also identified as having low-quality burrows. While the pond habitat and topographic depression may provide suitable aquatic breeding habitat for CTS they are both well outside of the known breeding locations. Bear Creek is not considered suitable breeding habitat for CTS given that it is an intermittent, fast-flowing creek during the rainy season. No CTS or burrows were observed in or around the topographic depression. The man-made pond is fenced within private property and therefore was not surveyed for burrows or to verify if it is stocked with fish or it provides watering for livestock. No CTS were encountered in the topographic depression or within the entire BSA. Construction activities associated with the Proposed Project could impact CTS, since low-quality estivation habitat for this species is present within the BSA, if it was to enter the project work limits. However, all burrow areas observed west of Bollea Road would not be impacted under the preferred

alternative (Figure 5 of **Appendix A**). Direct and indirect impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 4.2.3** and **Section 4.3.3**, including preconstruction surveys, worker awareness training conducted prior to construction initiation, and avoidance of habitat through the placement of exclusionary fencing around the impact area. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but *not likely to adversely affect* CTS.

California red-legged frog (*Rana aurora draytonii*)

Federal Status – Threatened

State Status – Threatened

California red-legged frogs (CRLF) require suitable aquatic habitat, embedded within a matrix of riparian and upland dispersal habitats, for breeding. Aquatic breeding habitats, including pools and backwaters within streams, creeks, ponds, marshes, springs, sag ponds, dune ponds, lagoons, and artificial impoundments, are typically found in upland habitats at elevations in the range of sea level to approximately 1160 meters above sea level. Breeding typically occurs between November and March and CRLF require 11-30 weeks of permanent water for larval development (CDFG, 2008). Beginning with the first rains of fall, CRLF make overland excursions through upland habitats at night and move up to 1.6 kilometers throughout one wet season. CRLF rest and forage in riparian vegetation and disperse from their aquatic breeding habitats to forage and seek summer habitat when water is not available (USFWS, 2002). Summer habitats include spaces under boulders or rocks and organic debris, such as downed trees or logs, industrial debris, and agricultural features, such as drains, water troughs, abandoned sheds, or hay-ricks (USFWS, 2002).

There are no CNDDDB records of CRLF within 5 miles of the BSA. Bear Creek is not a suitable aquatic habitat for breeding, given that it is a perennial, fast-flowing creek during the rainy season. The lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF. Construction activities associated with the Proposed Project could impact CRLF, since the lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for CRLF, and even though these areas are outside of the impact area, CRLF could pass through the construction areas while accessing these aquatic habitats if barriers to passage are not in place. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 4.3.3**, including preconstruction surveys, worker awareness training, and the placement of exclusionary fencing prior to construction initiation. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but *is not likely to adversely affect* CRLF.

Swainson's hawk (*Buteo swainsoni*)

Federal Status – None

State Status – Threatened

Swainson's hawks require suitable terrestrial habitat for nesting. Swainson's hawks arrive in the Central Valley and nest peripherally in valley riparian systems, as well as in lone trees or groves of trees in agricultural fields. Suitable habitat for nesting, including Valley oak, Fremont cottonwood, walnut, and

willow trees, are typically found in riparian and grassland habitats at elevations in the range of 41 to 82 feet above sea level. Nesting typically occurs between March and August. Breeding pairs construct nests composed of sticks, leaves, and bark. Eggs are laid from mid- to late-April and are incubated into mid-May when young begin to hatch. Young remain near the nest and depend on adults for approximately four weeks after fledging until they permanently leave the breeding territory. Swainson's hawks feed on small mammals, birds, and insects; young are fed rodents, rabbits, and reptiles. When not breeding, Swainson's hawks are atypical because they are almost exclusively insectivorous (England et al., 1997). Typical foraging habitat includes annual grasslands, alfalfa, and other dry farm crops that provide suitable habitat for small mammals. Suitable foraging habitat nearby nesting sites is critical for fledging success. No raptor nests were observed within or adjacent to the BSA.

There are five CNDDDB records of Swainson's hawks within 5 miles of the BSA. Construction activities associated with the Proposed Project could impact Swainson's hawks, since habitat for this species may be present within the BSA, if it was to enter the project work limits. Direct impacts to this species would be avoided through the implementation of avoidance and minimization efforts presented in **Section 4.3.3**, including preconstruction nesting surveys and worker awareness training conducted prior to construction initiation. With implementation of these measures, the Proposed Project would have no impacts to Swainson's hawks.

Hardhead (*Mylopharodon conocephalus*)

Federal Status – None

State Status – Species of Special Concern

Hardhead was designated as a species of special concern by CDFW in 1995 and is listed as a Class 3 Watch List Species by CDFW. It currently occupies much of its native range but was formerly more widespread or abundant within that range (Moyle, 2002). Historically, hardhead was considered a widespread and locally abundant species in California, but its specialized habitat requirements, widespread alteration of downstream habitats, and predation by smallmouth bass (*Micropterus dolomieu*) have resulted in population declines and isolation of populations (Moyle, 2002).

Hardheads require suitable aquatic habitat for spawning. Aquatic breeding habitats for hardhead, including spawned populations, have been reported in the upper Yuba River, the lower Bear, Feather, and Yuba Rivers, and the Honcut Creek headwaters (Moyle, 2002). Adult hardhead begin their migration to their smaller tributary spawning grounds in the spring and spawn in the foothill streams of the Sacramento and San Joaquin river basins through August. Spawning behavior has not been documented but they are believed to elicit mass spawning in gravel riffles (Moyle, 2002). Little is known about life stage specific temperature requirements but temperatures ranging from approximately 65°F to 75°F are believed to be suitable (Moyle, 2002). They mature following their second year and can reach lengths of 23 inches (Moyle, 2002).

There is no CNDDDB record within 5 miles of the BSA. Bear Creek may provide suitable aquatic habitat for this species within the BSA during high levels of precipitation. Construction activities associated with the Proposed Project could impact hardhead, since habitat for this species may be present within the BSA, if it was to enter the project work limits. Direct impacts to this species would be avoided through the

implementation of avoidance and minimization efforts presented in **Section 4.1.3**, **Section 4.2.3**, and in **Section 4.3.3** (described below), as these measures will eliminate the chance of fish being present within the construction area. With implementation of these measures, the Proposed Project would have no impacts to hardhead.

Steelhead (*Oncorhynchus mykiss*) – Central Valley distinct population segment

Federal Status – Threatened

State Status – None

Central Valley steelhead distinct population segment (DPS) require suitable aquatic habitat for spawning. Aquatic breeding habitats for the Central Valley steelhead, including naturally spawned populations in the Sacramento and San Joaquin Rivers and their tributaries, span across Amador, Alameda, Butte, Calaveras, Contra Costa, Colusa, Glenn, Mariposa, Merced, Nevada, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba counties. Adult Central Valley steelhead begin their migration from the ocean to their spawning grounds in late fall through early winter and typically arrive and spawn shortly thereafter between December and April. Spawning takes place in shallow waters, typically in glides and shallow runs at depths in the range of 0.2 m to 1.0 m, in gravel substrate that range in diameter from 0.3 cm to 10.0 cm. Eggs optimally develop at temperatures in the range of 9 to 11 degrees Celsius (°C) (48 to 52 degrees Fahrenheit (°F)). After emergence, fry seek shallow edge water habitat for several months, after which they disperse into suitable mid-channel habitat. Juvenile growth and survival optimally occurs at temperatures in the range of 13 to 17 °C (55 to 64 °F) and with dissolved oxygen (DO) levels greater than 9 milligrams per liter. Prior to migrating to the Pacific Ocean, juveniles remain in freshwater environments for one to two years and forage on aquatic invertebrates. They spend one to three years in nearshore saltwater and occasionally pelagic habitats, foraging on crustaceans, small fish, and squid before reaching maturity and returning to their natal streams to spawn (Moyle, 2002; McEwan and Jackson, 1996).

There is one CNDDDB record within 5 miles of the BSA on the Mokelumne River, downstream of the Camanche Dam to the southwest of the Project Site. Bear Creek is not designated CH or EFH for Central Valley steelhead but suitable aquatic habitat may be present in the BSA during high levels of precipitation (USFWS 2019a, NOAA, 2019a). In addition several potential fish barriers that could impede steelhead access were identified downstream of Bear Creek (CDFW, 2019b). CH for this species exists within 5 miles of the BSA, approximately 4.75 miles to the northwest. Construction activities will not impact Steelhead due the presence of multiple fish barriers downstream and the lack of flowing water through the BSA during the dry season which make the Project inaccessible to Steelhead. Avoidance measures outlined in Section 4.1.3., Section 4.2.3, and in Section 4.3.3. (described below) will ensure there will be no adverse effect to Steelhead downstream of the BSA. There will be no effect to Central Valley Steelhead.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

Federal Status – Threatened

State Status – Species of Special Concern

The valley elderberry longhorn beetle (VELB) is completely dependent on its host plant, elderberry (*Sambucus* spp.), in and around California's Central Valley during its entire life cycle (USFWS, 1984). VELB larvae live within the soft pith of the elderberry where they feed for 1-2 years. Adults emerge from exit holes created by the larva just prior to pupation inside the wood of elderberry shrubs during the spring as the plant begins to flower. Adults generally emerge from late March through June, and adults are short-lived (USFWS 1999). The adults feed on the elderberry foliage up until they mate. Females lay their eggs in the crevices of elderberry bark. Upon hatching the larvae then tunnel into shrub stems and feed there. VELB typically utilize stems that are greater than one inch in diameter at ground level (USFWS, 1984). Due largely to the loss of riparian habitat within California's Central Valley, the VELB populations in the state had decreased to a point that in 1980 the USFWS listed the species as threatened pursuant to the FESA. In addition unoccupied suitable habitat is considered important to maintain connectivity between VELB metapopulations (USFWS 2017). USFWS has designated Critical Habitat for this species in Sacramento County.

There are two CNDDDB records of VELB within 5 miles of the BSA. One record is located one mile to the north east (#210) and the second is approximately 4.75 miles to the west (#160). There is no CH within 5 miles of the project site. Riparian habitat along Bear Creek and the northwestern portion of the BSA contains potentially suitable habitat for VELB (**Figure 4**). Two blue elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs were documented growing in riparian vegetation within 165 feet of the BSA. One elderberry shrub is located on the northern bank of Bear Creek, approximately 50 feet east of the Proposed Project permanent disturbance limits (**Figure 4-6**). This plant is young with few branches reaching approximately 8 feet tall and its largest branch measured 1.125 inches in diameter. This young plant has a dripline of approximately 6 feet in diameter. No VELB exit hole were observed on any of the branches that reached 1 inch or more. No other evidence that would indicate current or past presence of VELB were detected.

The second elderberry shrub is located within the Proposed Project limits, on the north side of Bollea Road within a strip of riparian habitat approximately 30 feet north west of Bollea Road (**Figures 4-6**). This plant may actually be a grouping of several mature elderberry shrubs with multiple stems that reach up to 15 feet tall and diameters up to 2.5 inches. This larger mature shrub/s create a dripline diameter approximately 30 feet. No VELB exit hole were observed on any of the branches that reached 1 inch or more. No other evidence that would indicate current or past presence of VELB were detected. This shrub/s is within a powerline right of way and appears to be regularly trimmed for vegetation management.

Although suitable habitat for this species is present within the BSA, construction activities associated with the Proposed Project will not impact VELB since all known elderberry shrubs will be completely avoided. Direct and indirect impacts to this species would be avoided through the implementation of avoidance and minimization measures outlined in **Section 4.1.3**, **Section 4.2.3**, and in **Section 4.3.3** (described below) including worker awareness training conducted prior to construction initiation, and avoidance of elderberry shrubs through the placement of exclusionary fencing 20 feet from any shrub. With implementation of these measures, the Proposed Project would result in a determination of *may affect*, but *not likely to adversely affect* VELB.

Western pond turtle (*Actinemys marmorata*)

Federal Status – None

State Status – Species of Special Concern

Western pond turtles have declined in conjunction with habitat alteration due to urbanization and agricultural development. Nesting and basking habitats are important for egg maturation and are crucial to self-sustaining population. Loss of emergent wetland vegetation due to grazing and trampling results in less-suitable habitat for hatchlings and juveniles. Fire suppression on native grasslands cause overgrowth, which in turn excessively shades nesting grounds. Introduced predators, such as bullfrogs and warm-water fish, decimate hatchling turtle numbers.

Western pond turtles require suitable habitat for breeding. Aquatic breeding habitats, including ponds, marshes, rivers, streams, and irrigation ditches that typically have muddy or rocky bottom and grow aquatic vegetation, are typically found in Pacific-slope drainages at elevations of approximately 1,450 meters above sea level. Western pond turtles require basking sites, such as logs or mats of submergent vegetation, and prefer habitats with stable banks, open areas to bask, and underwater coverage provided by logs, large rocks, bulrushes, or other vegetation. This species leaves their aquatic site only to reproduce and to hibernate. Breeding typically occurs between April and September. Egg-laying, which may take place up to 0.5 kilometers from water, occurs in May and June. Hibernation occurs between October and March (Stebbins, 2003).

There is one CNDDDB records of western pond turtles within 5 miles of the BSA. Bear Creek is not a suitable aquatic habitat for breeding, given that it is a perennial, fast-flowing creek during the rainy season. The uplands adjacent to the lacustrine habitat and topographic depression may provide suitable aquatic breeding habitat for western pond turtle. Construction activities associated with the Proposed Project could impact western pond turtles, since habitat for this species may be present within the BSA, if it was to enter the project work limits. Direct impacts to this species would be avoided through the implementation of avoidance and minimization measures outlined in **Section 4.1.3**, **Section 4.2.3**, and in **Section 4.3.3** (described below) will eliminate the chance of western pond turtle being present within the construction area. With implementation of these measures, the Proposed Project would have no impacts to western pond turtles.

4.3.3 Avoidance and Minimization Efforts

In addition to the BMPs listed in **Section 4.1.3** and **Section 4.2.3**, the following measures shall be implemented to reduce impacts to special-status animal species:

BIO-7: Avoidance and Minimization Measure for California Tiger Salamander

While no impacts are anticipated, the following measures shall be implemented to avoid and minimize adverse effects to CTS as a result of the Proposed Project:

- No less than 14 days prior to initiating ground-disturbing activities, a Service-approved biologist shall conduct preconstruction surveys in accordance with applicable regulations and guidelines

for CTS or burrows capable of supporting CTS estivation or as refugia. These areas will be clearly marked and avoided by at least 50 feet. In accordance with mitigation measure **BIO-4**, will be fenced with appropriate exclusion fencing to avoid CTS from inadvertently accessing the construction area. It is anticipated that all low quality burrows will thus also be avoided. If the burrows cannot be avoided, Caltrans will contact the Service to discuss additional measures that may be needed and obtain an Incidental Take Statement if needed.

- Prior to the start of construction activities, a Service-approved biologist will provide education and training sessions for all individuals that will be involved with site preparation or construction. The training will focus on habitat sensitivity and identification of salamanders. The training will include species description and behavior, general measures that will be taken to protect these species as they relate to the proposed project, the penalties for non-compliance, and the boundaries of the proposed project site. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.
- Construction activities will be timed to occur during the dry season (May 1 - October 15) between 30 minutes after sunrise to 30 minutes before sunset to minimize potential effects to salamander dispersal. Work will not be conducted if raining. A Service-approved biologist will check the National Weather Service prior to each scheduled work day. No construction activities will be conducted in upland habitat areas where salamanders may occur if it is raining, if there is a greater than 70% chance of rain based on the National Oceanic and Atmospheric Administration's National Weather Service forecast on that work day, or within 48 hours following a rain even greater than 0.25 inch.
- The contractor will confine all equipment to designated work zones (including access roads and material/ equipment storage and staging area).
- All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 65 feet from any water body.
- All construction pipe, culverts, or similar structures that are laid underground or stored at the construction site for one or more overnight periods will be capped or covered in a manner that excludes salamanders from entering the pipe. Long-term storage of pipes and other construction material should be placed on asphalt and raised above the ground by no less than 1.5 inches. All pipes shall be thoroughly inspected before being moved, buried, or capped. If during inspected a CTS is discovered inside a pipe, that section of pipe shall not be moved until the salamander has escaped on its own or USFWS and CDFW will be contacted for further instruction.
- Project personnel will exercise caution when commuting to the construction area to minimize any chance for the inadvertent injury or mortality of species encountered on major roads leading to and from the construction area. Project-related vehicles and equipment will not exceed 20 mph in the action area.
- Vehicles and equipment will be thoroughly inspected for the presence of CTS prior to movement. If a CTS is found, USFWS and CDFW shall be contacted for further guidance. No equipment will be moved until the CTS have left voluntarily.
- Excavated areas 6 inches deep or more will be covered in a manner that exclude salamander or will be provided with escape ramps at a 3:1 slope. No gaps greater than 1 inch will be allowed

within cover materials. Each covered excavation should be checked daily until the excavation is filled.

- All stakes, flagging, and fencing used to delineate the construction area will be removed no later than 30 days after construction and restoration are complete.
- A litter control program shall be instituted at the entire Project site. Contractors will provide closed garbage containers for the disposal of all food-related trash items (e.g., wrappers, cans, bottles, food scraps). All garbage will be removed daily from the Project site.
- All fencing, flagging, debris, trash, and materials from work areas will be removed following completion of construction and habitat restoration activities.
- The USFWS- and CDFW-approved biologist shall have oversight over the implementation of all conservation measures, and shall have the authority to stop Project activities if any of the requirements associated with these measures are not being fulfilled.
- While highly unlikely, in the case of injured and/or dead CTS, USFWS and CDFW shall be notified of events within one day and the animals shall only be handled by a USFWS- and CDFW-approved biologist. Injured CTS shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal shall be preserved and held in a secure location until instructions are received from the USFWS and CDFW regarding the disposition of the specimen or until USFWS or CDFW takes custody of the specimen. The applicant must report to USFWS and CDFW within one calendar day any information about take or suspected take of CTS. Notification must include the date, time, and location of the incident or of the finding of a dead or injured CTS. Work will stop immediately if an incident occurs until corrective actions are provided by the USFWS.

BIO-8: Avoidance and Minimization Measure for California Red-Legged Frog

In conjunction with avoidance and minimization measures listed in **Section 4.1.3** and **Section 4.2.3** and those listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to CRLF as a result of the Project:

- Before the project activities begin, all construction personnel shall attend a Worker Environmental Awareness Training session conducted by a Service-approved biologist. The session shall describe CRLF and its habitat, address proper implementation of avoidance measures, and clarify the boundaries within which the project may be accomplished
- While there are no sightings within 5 miles to be safe, the potential breeding habitats, including the pond and topographic depression, shall be avoided as part of project design. In accordance with mitigation measure **BIO-4**, these habitats will be fenced off with barrier material to prevent CRLF from moving into the project site. This barrier will be constructed out of properly-installed silt fencing or an equivalent material to prevent movement of amphibians into the project site.
- Prior to commencing site disturbance, including vegetation and/ or ground disturbance, a Service-approved biologist(s) will be identified to monitor implementation of biological mitigation measures. The Service-approved biologist will be present for all initial ground disturbing activities.
- If any CRLF are observed in the Project work limits during construction, work will immediately stop, and the CRLF will be allowed to move out of harm's way on its own accord, and the Service

will be contacted within 24 hours to reinitiate consultation.

BIO-9: Avoidance and Minimization Measure for Swainson's hawk

If construction is to begin within the nesting season (March 15 to October 15), a survey for nesting Swainson's hawks will occur within a 500-foot buffer of, and including, the BSA within 14 days of the start of construction. Using standard nest-searching methods, a qualified biologist will determine whether any nesting Swainson's hawks occur within this area. If any active nests are located, coordination with the CDFW will occur to determine the appropriate buffer for construction activities and timing of work within that buffer. If a gap in construction activities of greater than 14 days occurs, or 14 days lapses from the time of survey to the start of construction, an additional survey for nesting birds will occur following the same protocols.

BIO-10: Avoidance and Minimization Measure for Steelhead

While the only recorded steelhead sighting is in a different watershed, to ensure no impacts, all work within the delineated stream boundary shall be limited to the timeframe between June 15 and October 31, or the first significant rainfall, whichever comes first. This will take advantage of low stream flows and is designed to avoid the spawning and egg/alevin incubation period of steelhead.

BIO-11: Avoidance and Minimization Measure for Hardhead

While presence is unlikely, avoid any potential impacts of the project on hardhead, **BIO-10** shall be used as an avoidance and minimization measure.

BIO-12: Avoidance and Minimization Measure for Valley Elderberry Longhorn Beetle

In conjunction with avoidance and minimization measures listed in **Section 4.1.3** and **Section 4.2.3** and those listed in this section, the following measures shall be implemented to avoid and minimize adverse effects to VELB as a result of the Project:

- In addition to mitigation measure **BIO-4**, prior to initiating construction, highly visible fencing will be installed at the 20-foot setback around the perimeter of each elderberry plant or plant group. ESA fencing will consist of highly visible construction fencing or equivalent, and will be maintained until construction is complete. A qualified biologist will be present during the installation of fencing. If a minimum 20-foot setback from the dripline of all elderberry plants in the Action Area cannot be maintained for all project activities, the Service will be contacted and additional mitigation measures may be required
- Signs will be erected every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs will be clearly readable from a distance of 20 feet, and will be maintained for the duration of construction.

- In conjunction with avoidance and minimization measure BIO-6, an employee awareness training will be provided for the contractor the status of VELB, and emphasize the need to avoid impacting its habitat and host elderberry shrubs, and the possible penalties for not complying with these requirements.
- A qualified biologist will periodically inspect the construction area to assure that fencing and signs are intact and that the two elderberry shrubs adjacent to the proposed project are being avoided.
- No insecticides, fertilizers, or other chemicals that might harm the beetle or elderberry plants will be used within 100 feet of any elderberry plant with stems measuring greater than 1-inch in diameter. Herbicides may be used within 100 feet at the discretion of the permitting agencies. Any damage occurring within the elderberry buffer areas (within 100 foot of the elderberry plants) will be restored and revegetated with appropriate native species at the completion of construction.
- As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, should be conducted outside of the flight season of the VELB (March – July).

BIO-13: Avoidance and Minimization Measure for Western Pond Turtle

While the presence of the western pond turtle is unlikely, to reduce any potential impacts of the project on western pond turtle, **BIO-8** and **BIO-4** shall be used as an avoidance measures.

4.3.4 Compensatory Mitigation

Implementation of avoidance and minimization efforts listed in **Section 4.1.3** and **Section 4.3.3** would ensure that no adverse effects to special-status animal species would occur as a result of the Proposed Project. Therefore, no compensatory mitigation is proposed.

4.3.5 Cumulative Impacts

The FESA defines cumulative effects as those effects of future state, tribal, local, or private activities, which are reasonably certain to be conducted within the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. The cumulative setting for CTS, CRLF, Swainson's hawk, Steelhead, Hardhead, VELB, and western pond turtle is the extent of its range, primarily within the Central Valley. Habitat removal from current and future development in the area is the biggest threat to CTS, CRLF, Swainson's hawk, Steelhead, Hardhead, VELB, and western pond turtle. The project would include replacing an existing bridge and would not contribute to development in the area or contribute to a cumulative loss in suitable habitat. Currently, there is no additional known state or private projects that are planned within the BSA. Further, no take of the species is anticipated and with the implementation of the project's avoidance and minimization measures the project would avoid adverse effects on the species. Therefore, the project is not expected to result in cumulatively considerable effects on CTS, CRLF, Swainson's hawk, Steelhead, Hardhead, VELB or western pond turtle.

4.4 MIGRATORY BIRDS AND OTHER BIRDS OF PREY

4.4.1 Survey Results

Several migratory bird species were observed during the biological site survey of the BSA. Some of the species identified included cliff swallow (*Petrochelidon pyrrhonota*), California scrub jay (*Aphelocoma californica*), red-shouldered hawk (*Buteo lineatus*), yellow-rumped warbler (*Setophaga coronata*), turkey vulture (*Cathartes aura*), American turkey (*Meleagris gallopavo*), and red-tailed hawk (*Buteo jamaicensis*).

4.4.2 Project Impacts

Potential nesting habitat is present within the BSA for migratory bird species and other birds of prey. If active nests are present in these areas, tree removal and other construction activities associated with construction of the Proposed Project could result in impacts to these species. The nests and eggs of any bird are protected from “take” pursuant to the federal Migratory Bird Treaty Act and the California Fish and Game Code Section 3503.

4.4.3 Avoidance and Minimization Efforts

The following avoidance and minimization measures shall be implemented to avoid project-related impacts to nest sites for birds of prey and migratory birds. In addition to the avoidance measures listed in **Section 4.3.3**, the following measures would help avoid project-related impacts to migratory birds:

BIO-14: Install Exclusionary Netting beneath the Existing Bridge

To prevent potential impacts to nesting birds or roosting bats, the underside of the existing bridge shall be netted with tightly strung netting with less than half-inch mesh and no opening greater than half-inch along any seams, transitions, or connection points with the bridge during the timeframe from late October through early March. Netting shall be checked weekly and repairs made immediately. Demolition and removal of the existing bridge shall only be initiated after the bridge has been confirmed to be free of roosting bats and nesting migratory birds.

BIO-15: Conduct Preconstruction Surveys for Active Nests

A qualified biologist shall conduct a preconstruction survey for active nests should construction commence during the nesting season for birds of prey and migratory birds (between February 15 and September 1). Cavities within trees proposed to be removed shall be surveyed for nesting birds. The preconstruction survey will be conducted within 14 days prior to commencement of construction activities. If surveys show that there is no evidence of nests, then no additional mitigation will be required so long as construction commences within 14 days of the survey.

If any active nests are located within the study area, a buffer zone shall be established by a qualified biologist around the nests. The biologist shall delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of breeding season or the young have fledged. Consultation with CDFW will be requested if establishing a 250-foot buffer zone is impractical.

Trees anticipated for removal should be removed prior to nesting season. The dates outside of the nesting season include from September 2 to February 14. If trees are anticipated to be removed during the nesting season, a preconstruction survey shall be conducted by a qualified biologist. If the survey shows that there is no evidence of active nests, then the tree shall be removed within ten days following the survey. If active nests are located within trees identified for removal, a 250-foot buffer shall be installed around the tree by a qualified biologist. Consultation with CDFW will be requested if establishing a 250-foot buffer zone is impractical.

4.4.4 Compensatory Mitigation

Implementation of avoidance and minimization efforts listed in **Section 4.4.3** would ensure that there are no impacts to migratory birds and other birds of prey would occur as a result of the Proposed Project. Therefore, no compensatory mitigation is proposed.

4.4.5 Cumulative Impacts

The FESA defines cumulative effects as those effects of future state, tribal, local, or private activities, which are reasonably certain to be conducted within the action area described in this biological assessment. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. The cumulative setting for migratory birds and other birds of prey is the extent of its range, primarily within the Central Valley. Habitat removal from current and future development in the area is the biggest threat to migratory birds and other birds of prey. The project would include replacing an existing bridge and would not contribute to development in the area or contribute to a cumulative loss in suitable habitat. Currently, there is no additional known state or private projects that are planned within the BSA. Further, no take of the species is anticipated and with the implementation of the project's avoidance and minimization measures the project would avoid adverse effects on the species. Therefore, the project is not expected to result in cumulatively considerable effects on migratory birds and other birds of prey.

5.0 CONCLUSIONS AND REGULATORY DETERMINATIONS

5.1 FEDERAL ENDANGERED SPECIES ACT CONSULTATION SUMMARY

It was established that seven federally-listed species reviewed do not have habitat suitable for their presence within the BSA: lone buckwheat, Sacramento Orcutt grass, steelhead (Central Valley DPS), Delta smelt, vernal pool fairy shrimp, vernal pool tadpole shrimp, and giant garter snake. Therefore there is no effect to these species as a result of the Proposed Project.

Four federally-listed species have habitat suitable for their presence within the BSA: lone manzanita (threatened), CTS (threatened), CRLF (threatened), and VELB (Threatened). Analysis of these species and the impacts to these species have determined that Proposed Project *may affect*, but is not likely to adversely affect lone manzanita, CTS, CRLF, and VELB as a result of the Proposed Project. There will be no effect to all other species listed on the USFWS and NMFS species lists. With implementation of the conservation measures, compensatory mitigation will not be needed for any of the listed species with potential to occur in the BSA.

5.2 ESSENTIAL FISH HABITAT CONSULTATION SUMMARY

An official NOAA Fisheries species list (NOAA, 2019b; **Appendix B-4**) requested by Caltrans, the federal lead agency, designates EFH for Chinook salmon within the Wallace, CA USGS quad. In addition, the EFH mapper indicates that the watershed that Bear Creek is within is considered EFH (NOAA, 2019a). Essential fish habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. While other waters within the Wallace CA USGS 7.5' Quadrangle may provide these elements, Bear Creek does not. Habitat for Chinook salmon is unavailable due to multiple fish barriers downstream of the BSA. Bear Creek does not provide suitable spawning, rearing, or foraging habitat for salmonids due to its intermittent nature and the lethal warm temperatures during the summer. Based on this, the Proposed Project will have no adverse effect on Essential Fish Habitat (EFH) for Chinook salmon within the BSA. Therefore the Proposed Project will have no effect to EFH for Chinook salmon. Although Caltrans requested an official NOAA Fisheries species list, formal consultation with NOAA on impacts to EFH has not been initiated.

5.3 CALIFORNIA ENDANGERED SPECIES ACT CONSULTATION SUMMARY

Five state-listed species have the potential to occur within the BSA: CTS (threatened), CRLF (species of special concern), Swainson's hawk (threatened), hardhead (species of special concern), and western pond turtle (species of special concern). As no "take" of state-listed species is expected to occur, coordination with CDFW is not required. However, it is anticipated the County will notify CDFW about the less-than-significant impact with implementation of avoidance and minimization efforts. All CDFW requirements arising from consultation will be adhered to. With implementation of the avoidance and minimization efforts, the Proposed Project would not significantly impact state-listed species.

5.4 WETLANDS AND OTHER WATERS COORDINATION SUMMARY

A preliminary jurisdictional delineation has been prepared to identify jurisdictional Waters within the BSA (**Appendix D**). This report, which identifies riverine (Bear Creek) habitat and the lacustrine habitat as the only wetlands or other Waters of the U.S. within the BSA, will be sent to the local USACE office for concurrence. See **Table i** for a list of permits likely to be required as a result of this Proposed Project.

5.5 WETLANDS IMPACT AVOIDANCE (EXECUTIVE ORDER 11990):

Executive Order 11990 established a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The preliminary jurisdictional delineation provided in **Appendix D** determined that the topographic depression that occurs in the BSA did not meet the three-parameter test required to be considered a wetland and therefore is not considered jurisdictional by the USACE. Moreover the topographic depression and lacustrine habitat will be completely avoided by the Proposed Project. The Proposed Project complies with Executive Order 11990.

5.6 INVASIVE SPECIES

Low abundance of invasive species was observed within the BSA during the March 8, 2017 and July 20, 2017 field visits. Any seed mix used for site stabilization shall be certified weed free to prevent the spread of invasive species as a result of this Proposed Project.

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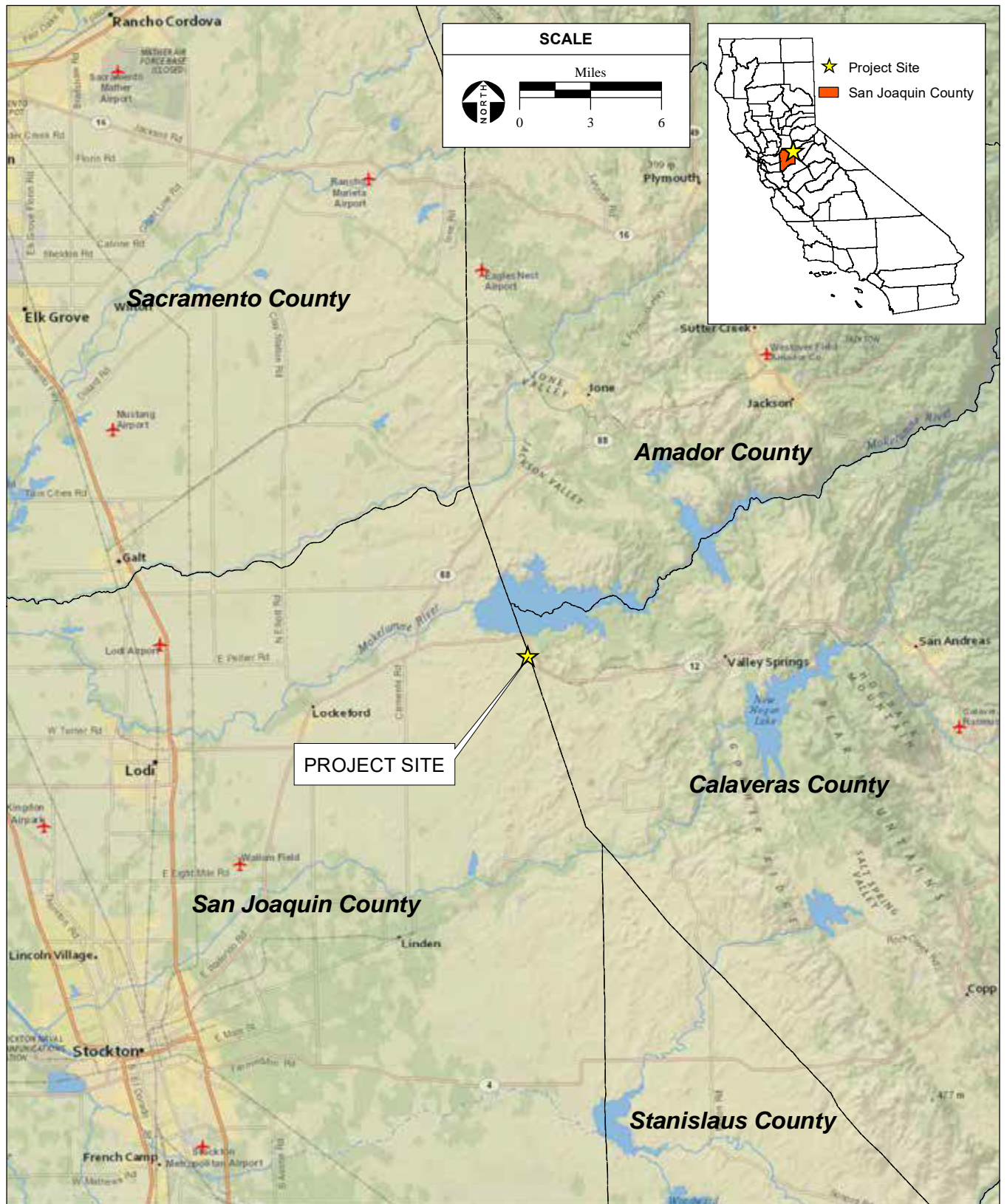
APPENDICES

APPENDIX A

FIGURES AND MAPS

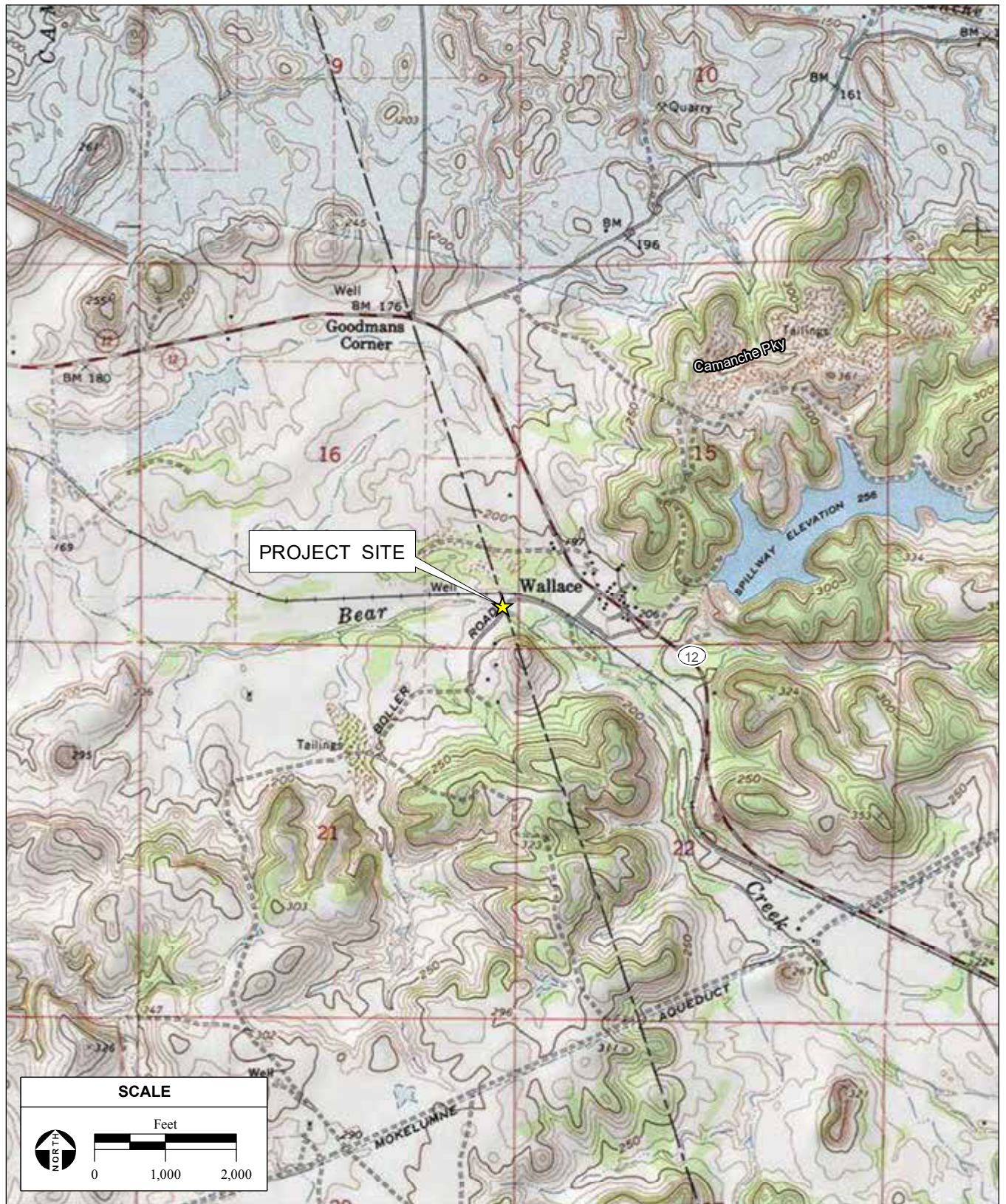
APPENDIX A-1

FIGURE 1. REGIONAL LOCATION



APPENDIX A-2

FIGURE 2. PROJECT LOCATION



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 7/31/2018

Bollea Bridge Replacement Project Natural Environment Study (Minimal Impacts) / 215572 ■

Appendix A - Figure 2

Project Location

APPENDIX A-3

FIGURE 3. AERIAL PHOTOGRAPH



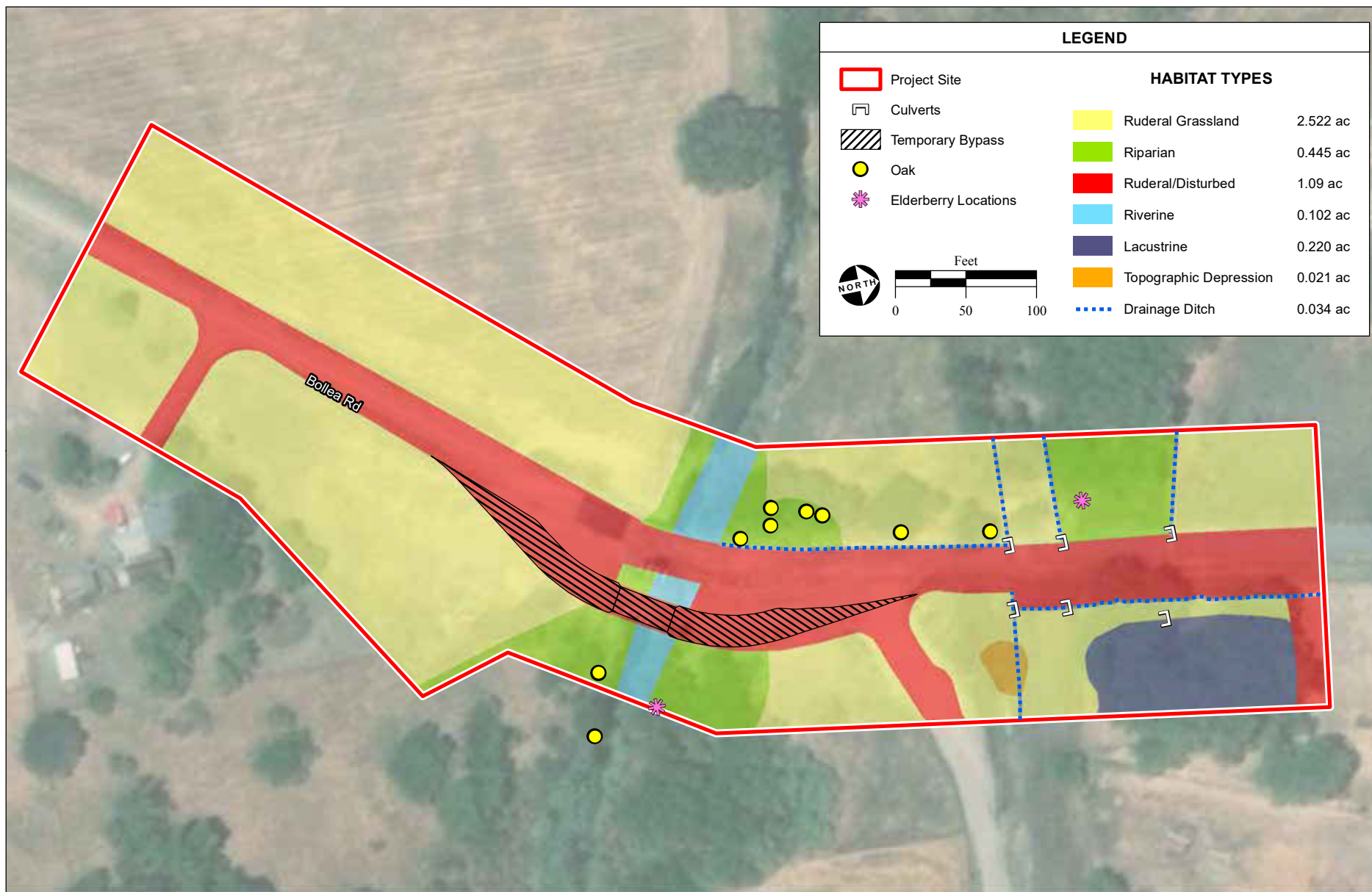
SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle,
T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 7/31/2018

Bollea Bridge Replacement Project Natural Environment Study (Minimal Impacts) / 215572 ■

Appendix A - Figure 3
Aerial Photograph

APPENDIX A-4

FIGURE 4. CURRENT HABITAT TYPES



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle,
T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 5/24/2019

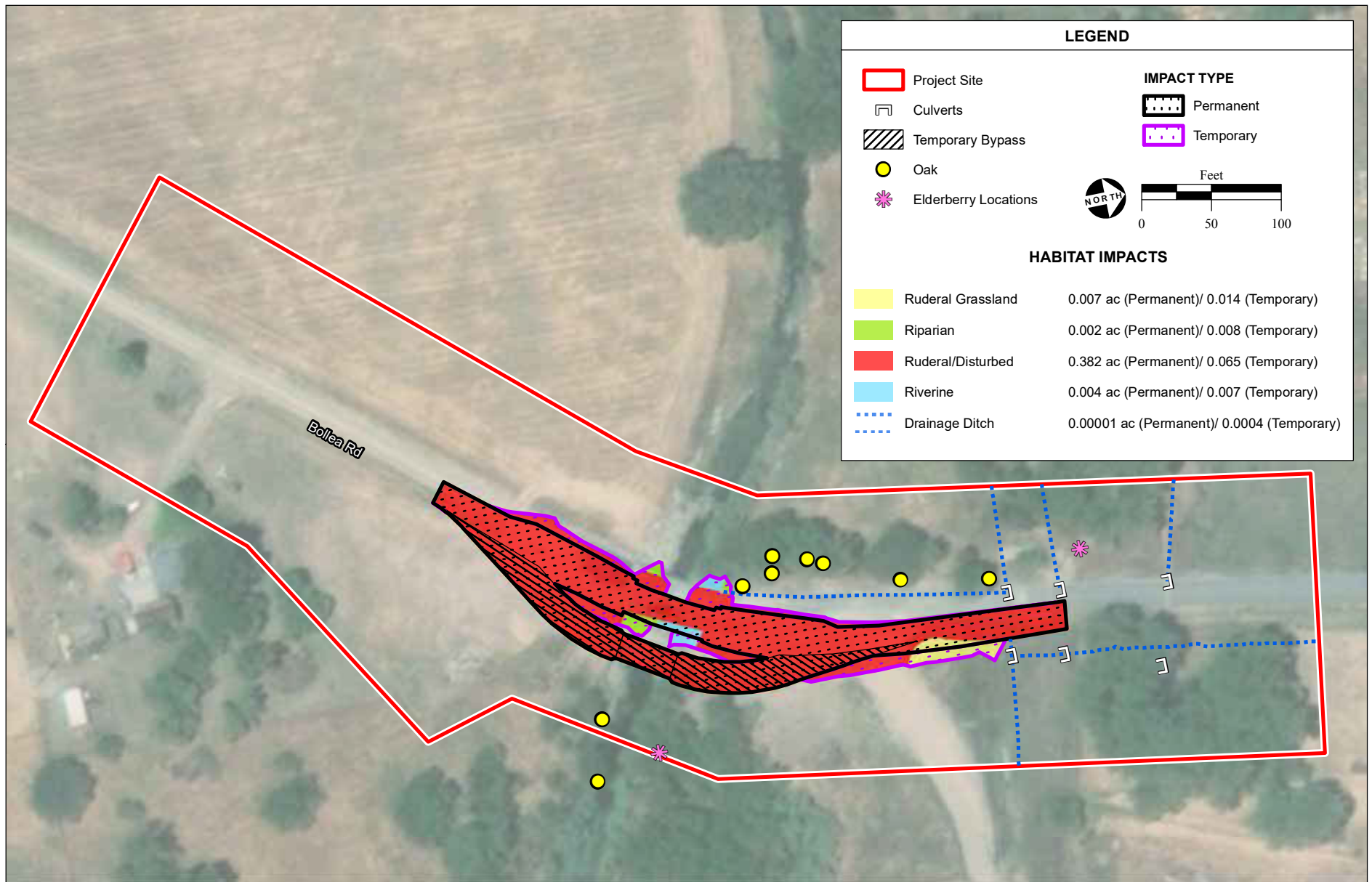
Bollea Bridge Replacement Project Natural Environment Study (Minimal Impacts) / 215572 ■

Appendix A - Figure 4

Current Habitat Types

APPENDIX A-5

***FIGURE 5. HABITAT IMPACTS UNDER 375 FOOT
ALTERNATIVE***



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle,
T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 5/24/2019

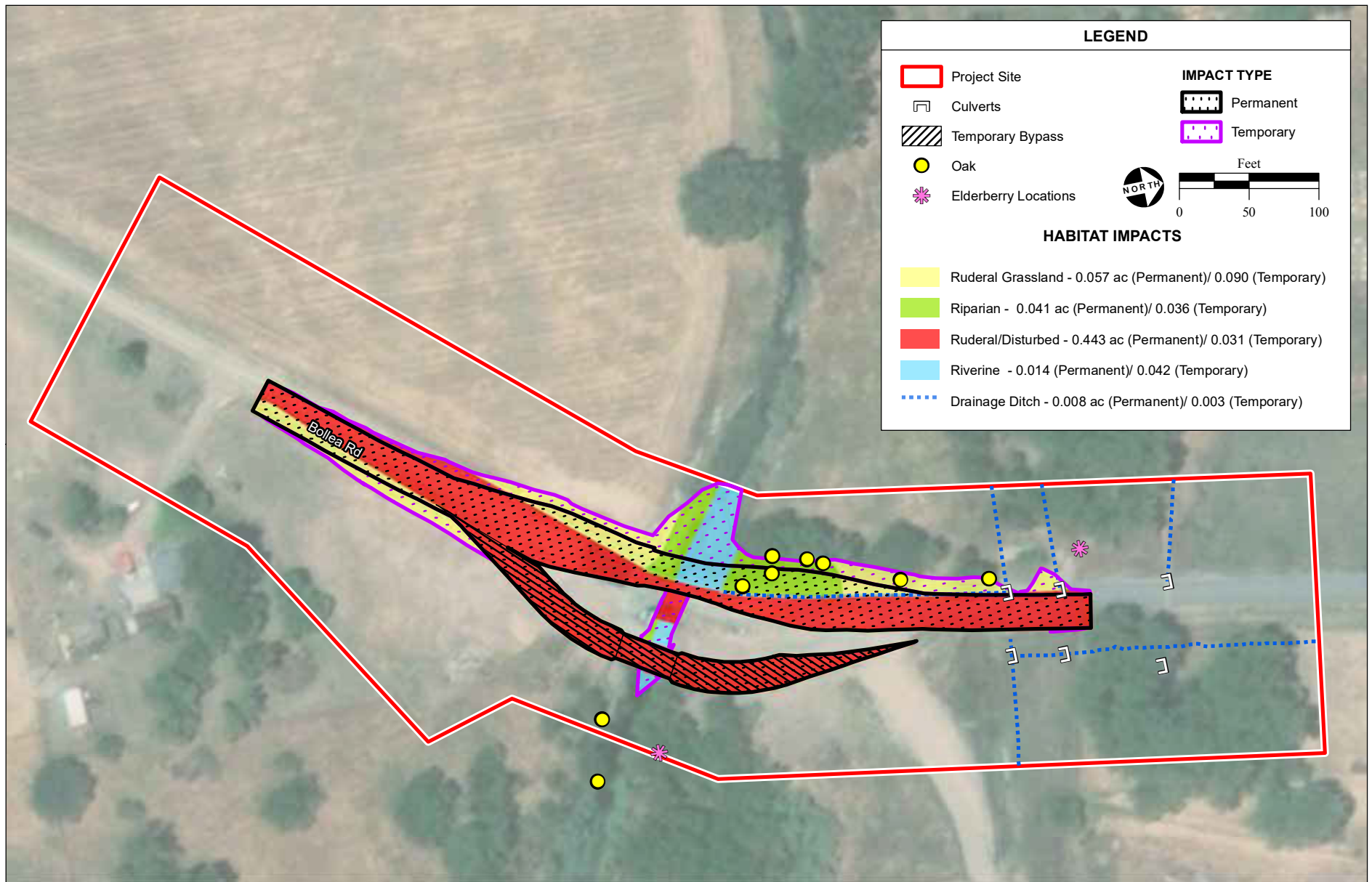
Bollea Bridge Replacement Project Natural Environment Study (Minimal Impacts) / 215572 ■

Appendix A - Figure 5

Habitat Impacts Under 375 Foot Alternative

APPENDIX A-6

***FIGURE 6. HABITAT IMPACTS UNDER 925 FOOT
ALTERNATIVE***



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle,
T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 5/24/2019

Bollea Bridge Replacement Project Natural Environment Study (Minimal Impacts) / 215572 ■

Appendix A - Figure 6
Habitat Impacts Under 925 Foot Alternative

APPENDIX A-7

FIGURE 7. SITE PHOTOGRAPHS



PHOTO 1: Grassland – northeast corner of site.



PHOTO 4: Topographic Depression – north of existing bridge.



PHOTO 2: Riparian - upstream of existing bridge.



PHOTO 5: Ruderal/Disturbed – south of existing bridge.



PHOTO 3: Bear Creek – downstream of existing bridge.



PHOTO 6: Man-Made Pond – northeast corner of site.

APPENDIX B

SPECIAL-STATUS SPECIES LISTS

APPENDIX B-1

USFWS OFFICIAL SPECIES LIST



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-0611
Event Code: 08ESMF00-2020-E-00157
Project Name: Bollea Bridge Replacement Project

October 08, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

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

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0611

Event Code: 08ESMF00-2020-E-00157

Project Name: Bollea Bridge Replacement Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: AES Project #215572

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.19341314440841N120.98265893251681W>



Counties: San Joaquin, CA

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Ione Manzanita <i>Arctostaphylos myrtifolia</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1806	Threatened

Critical habitats

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

APPENDIX B-2

CNDDDB SPECIES LIST



Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad IS (Goose Creek (3812131) OR lone (3812038) OR Jackson (3812037) OR Clements (3812121) OR Wallace (3812028) OR Valley Springs (3812027) OR Linden (3812111) OR Valley Springs SW (3812018) OR Jenny Lind (3812017))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01180	<i>Ambystoma californiense</i> California tiger salamander	Threatened	Threatened	G2G3	S2S3	WL
AAABF02020	<i>Spea hammondi</i> western spadefoot	None	None	G3	S3	SSC
AAABH01022	<i>Rana draytonii</i> California red-legged frog	Threatened	None	G2G3	S2S3	SSC
AAABH01050	<i>Rana boylei</i> foothill yellow-legged frog	None	Candidate Threatened	G3	S3	SSC
ABNKC01010	<i>Pandion haliaetus</i> osprey	None	None	G5	S4	WL
ABNKC10010	<i>Haliaeetus leucocephalus</i> bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC19070	<i>Buteo swainsoni</i> Swainson's hawk	None	Threatened	G5	S3	
ABNKC22010	<i>Aquila chrysaetos</i> golden eagle	None	None	G5	S3	FP
ABNKD06090	<i>Falco mexicanus</i> prairie falcon	None	None	G5	S4	WL
ABNSB10010	<i>Athene cunicularia</i> burrowing owl	None	None	G4	S3	SSC
ABPAU08010	<i>Riparia riparia</i> bank swallow	None	Threatened	G5	S2	
ABPBX24010	<i>Icteria virens</i> yellow-breasted chat	None	None	G5	S3	SSC
ABPBXB0020	<i>Agelaius tricolor</i> tricolored blackbird	None	Threatened	G2G3	S1S2	SSC
AFCHA0209K	<i>Oncorhynchus mykiss irideus pop. 11</i> steelhead - Central Valley DPS	Threatened	None	G5T2Q	S2	
AFCJB25010	<i>Mylopharodon conocephalus</i> hardhead	None	None	G3	S3	SSC
AMAFJ01010	<i>Erethizon dorsatum</i> North American porcupine	None	None	G5	S3	
ARAAD02030	<i>Emys marmorata</i> western pond turtle	None	None	G3G4	S3	SSC
CTT37D00CA	<i>Ione Chaparral</i> Ione Chaparral	None	None	G1	S1.1	
CTT44110CA	<i>Northern Hardpan Vernal Pool</i> Northern Hardpan Vernal Pool	None	None	G3	S3.1	



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ICBRA03030	<i>Branchinecta lynchi</i> vernal pool fairy shrimp	Threatened	None	G3	S3	
ICBRA06010	<i>Linderiella occidentalis</i> California linderiella	None	None	G2G3	S2S3	
ICBRA10010	<i>Lepidurus packardii</i> vernal pool tadpole shrimp	Endangered	None	G4	S3S4	
IICOL48011	<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	Threatened	None	G3T2	S2	
IIHYM35030	<i>Andrena blennospermatis</i> Blennosperma vernal pool andrenid bee	None	None	G2	S2	
IIHYM35210	<i>Andrena subapasta</i> An andrenid bee	None	None	G1G2	S1S2	
ILARA14080	<i>Banksula rudolphi</i> Rudolph's cave harvestman	None	None	G1	S1	
PDAPI0Z0P0	<i>Eryngium pinnatisectum</i> Tuolumne button-celery	None	None	G2	S2	1B.2
PDAPI0Z0S0	<i>Eryngium racemosum</i> Delta button-celery	None	Endangered	G1	S1	1B.1
PDAST11061	<i>Balsamorhiza macrolepis</i> big-scale balsamroot	None	None	G2	S2	1B.2
PDAST1P040	<i>Calycadenia hooveri</i> Hoover's calycadenia	None	None	G2	S2	1B.3
PDCAM060C0	<i>Downingia pusilla</i> dwarf downingia	None	None	GU	S2	2B.2
PDCAM0C010	<i>Legenere limosa</i> legenere	None	None	G2	S2	1B.1
PDCIS020F0	<i>Crocianthemum suffrutescens</i> Bisbee Peak rush-rose	None	None	G2?Q	S2?	3.2
PDERI04240	<i>Arctostaphylos myrtifolia</i> lone manzanita	Threatened	None	G1	S1	1B.2
PDPGN080F1	<i>Eriogonum apricum</i> var. <i>apricum</i> lone buckwheat	Endangered	Endangered	G2T1	S1	1B.1
PDPHR01130	<i>Erythranthe marmorata</i> Stanislaus monkeyflower	None	None	G2?	S2?	1B.1
PDPLM0C0X1	<i>Navarretia myersii</i> ssp. <i>myersii</i> pincushion navarretia	None	None	G2T2	S2	1B.1
PDPLM0C150	<i>Navarretia paradoxiclara</i> Patterson's navarretia	None	None	G2	S2	1B.3
PDROS0W0C0	<i>Horkelia parryi</i> Parry's horkelia	None	None	G2	S2	1B.2
PDSCR0R060	<i>Gratiola heterosepala</i> Boggs Lake hedge-hyssop	None	Endangered	G2	S2	1B.2



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PMJUN011L1	<i>Juncus leiospermus</i> var. <i>ahartii</i> Ahart's dwarf rush	None	None	G2T1	S1	1B.2
PMPOA040K0	<i>Agrostis hendersonii</i> Henderson's bent grass	None	None	G2Q	S2	3.2
PMPOA4G070	<i>Orcuttia viscida</i> Sacramento Orcutt grass	Endangered	Endangered	G1	S1	1B.1
PMPOA5T030	<i>Sphenopholis obtusata</i> prairie wedge grass	None	None	G5	S2	2B.2

Record Count: 44

APPENDIX B-3

CNPS SPECIES LIST

*The database used to provide updates to the Online Inventory is under construction. [View updates and changes made since May 2019 here.](#)

Plant List

21 matches found. [Click on scientific name for details](#)

Search Criteria

Found in Quads 3812131, 3812038, 3812037, 3812121, 3812028, 3812027, 3812111 3812018 and 3812017;

[Modify Search Criteria](#) [Export to Excel](#) [Modify Columns](#) [Modify Sort](#) [Display Photos](#)

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Listing Status	Federal Listing Status	State Rank
Agrostis hendersonii	Henderson's bent grass	Poaceae	annual herb	Apr-Jun	3.2			S2
Arctostaphylos myrtifolia	lone manzanita	Ericaceae	perennial evergreen shrub	Nov-Mar	1B.2		FT	S1
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2			S2
Brodiaea rosea ssp. vallicola	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	4.2			S3
Calycadenia hooveri	Hoover's calycadenia	Asteraceae	annual herb	Jul-Sep	1B.3			S2
Crocanthemum suffrutescens	Bisbee Peak rush-rose	Cistaceae	perennial evergreen shrub	Apr-Aug	3.2			S2?
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2			S2
Eriogonum apricum var. apricum	lone buckwheat	Polygonaceae	perennial herb	Jul-Oct	1B.1	CE	FE	S1
Eryngium jepsonii	Jepson's coyote thistle	Apiaceae	perennial herb	Apr-Aug	1B.2			S2?
Eryngium pinnatisectum	Tuolumne button-celery	Apiaceae	annual / perennial herb	May-Aug	1B.2			S2
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	CE		S1
Erythranthe marmorata	Stanislaus monkeyflower	Phrymaceae	annual herb	Mar-May	1B.1			SX
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2	CE		S2
Horkelia parryi	Parry's horkelia	Rosaceae	perennial herb	Apr-Sep	1B.2			S2
	Ahart's dwarf	Juncaceae	annual herb	Mar-May	1B.2			S1

<u>Juncus leiospermus</u> <u>var. ahartii</u>	rush								
<u>Legenere limosa</u>	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1				S2
<u>Navarretia myersii</u> <u>ssp. myersii</u>	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	1B.1				S2
<u>Navarretia</u> <u>paradoxiolara</u>	Patterson's navarretia	Polemoniaceae	annual herb	May- Jun(Jul)	1B.3				S2
<u>Orcuttia viscida</u>	Sacramento Orcutt grass	Poaceae	annual herb	Apr- Jul(Sep)	1B.1	CE	FE		S1
<u>Perideridia</u> <u>bacigalupii</u>	Bacigalupi's yampah	Apiaceae	perennial herb	Jun-Aug	4.2				S3
<u>Sphenopholis</u> <u>obtusata</u>	prairie wedge grass	Poaceae	perennial herb	Apr-Jul	2B.2				S2

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 07 October 2019].

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Contributors

[The Calflora Database](#)

[The California Lichen Society](#)

[California Natural Diversity Database](#)

[The Jepson Flora Project](#)

[The Consortium of California Herbaria](#)

[CalPhotos](#)

Questions and Comments

rareplants@cnps.org

APPENDIX B-4

NOAA SPECIES LIST

From: Porras.Samuel@DOT
To: nmfswoerca.specieslist@noaa.gov
Subject: 5929(236) Bollea Road Bridge - Caltrans (Federal Lead Agency) - NMFS Species List
Date: Wednesday, August 14, 2019 3:31:00 PM

Good Afternoon,

I am requesting an official FESA species list for the Wallace quadrangle listed below. Caltrans is the federal lead agency, as designated by FHWA. San Joaquin County is the project proponent (nonfederal lead agency).

Federal Lead Agency:

Samuel Porras
California Department of Transportation
1976 E. Dr. Martin Luther King Jr. Blvd
Stockton, CA 95205
Email: Samuel.Porras@dot.ca.gov
Office Phone: (209) 948-3667

Environmental Consultant (Point of Contact for San Joaquin County):

Nicholas Bonzey
Analytical Environmental Services (AES)
1801 7th Street, Suite 100
Sacramento, CA 95811
Office Phone: (916) 447-3479

Quad Name **Wallace**

Quad Number **38120-B8**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office

562-980-4000

MMPA Cetaceans -

MMPA Pinnipeds -

Thank you,

Samuel Porras

Associate Environmental Planner (Biologist)

California Department of Transportation – District 10

Division of Planning, Local Assistance & Environmental

Office: (209) 948-3667

APPENDIX C

LIST OF VASCULAR PLANT SPECIES OBSERVED

Table 1. List of Vascular Plant Species Observed at Bollea Road Bridge Replacement Project on March 8, and July 20, 2017. Wetland Indicator Status were classified according to the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016).

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Achillea millefolium</i>	yarrow	Asteraceae	native	annual herb	FACU
<i>Achyrachaena mollis</i>	blow wives	Asteraceae	native	annual herb	FAC
<i>Acmispon glaber</i>	deerweed	Fabaceae	native	perennial herb	UPL
<i>Agrostis stolonifera</i>	redtop	Poaceae	non-native	perennial grass	FACW
<i>Amsinckia menziesii</i>	common fiddleneck	Boraginaceae	native	annual herb	UPL
<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	native	perennial herb	FAC
<i>Avena barbata</i>	slender wild oat	Poaceae	non-native	annual grass	UPL
<i>Avena fatua</i>	wild oats	Poaceae	non-native	annual grass	UPL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	native	shrub	UPL
<i>Baccharis salicifolia</i>	mulefat	Asteraceae	native	shrub	FAC
<i>Briza minor</i>	little rattlesnake grass	Poaceae	non-native	annual grass	FAC
<i>Bromus diandrus</i>	ripgut brome	Poaceae	non-native	annual grass	UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	non-native	annual grass	FACU
<i>Bromus madritensis ssp. madritensis</i>	foxtail chess	Poaceae	non-native	annual grass	UPL
<i>Calandrinia menziesii</i>	red maids	Montiaceae	native	annual herb	UPL
<i>Cardamine oligosperma</i>	bitter cress	Brassicaceae	native	annual/perennial herb	FAC
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	non-native	annual herb	UPL
<i>Carex nudata</i>	torrent sedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Ceanothus cuneatus</i>	buckbrush	Rhamnaceae	native	perennial shrub	UPL
<i>Clarkia sp.</i>	clarkia	Onagraceae	native	annual herb	UPL
<i>Claytonia perfoliata</i>	miner's lettuce	Montiaceae	native	annual herb	FAC
<i>Croton setiger</i>	turkey-mullein	Euphorbiaceae	native	perennial herb	UPL
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Dactylis glomerata</i>	orchard grass	Poaceae	non-native	perennial grass	FACU
<i>Dichelostemma capitatum</i>	wild hyacinth	Themidaceae	native	perennial herb	FACU
<i>Diplacus aurantiacus</i>	Sticky monkeyflower	Phrymaceae	native	shrub	FACU
<i>Elymus glaucus</i>	blue wildrye	Poaceae	native	perennial herb	FACU

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Epilobium ciliatum</i>	slender willow herb	Onagraceae	native	perennial herb	FACW
<i>Epilobium densiflorum</i>	willow herb	Onagraceae	native	annual herb	FACW
<i>Erigeron canadensis</i>	Canada horseweed	Asteraceae	native	annual herb	FACU
<i>Eriodictyon californicum</i>	yerba santa	Boraginaceae	native	shrub	FACU
<i>Erodium botrys</i>	big heron bill	Geraniaceae	non-native	annual herb	FACU
<i>Erodium cicutarium</i>	red-stemmed filaree	Geraniaceae	non-native	annual herb	UPL
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	native	annual/perennial herb	UPL
<i>Festuca microstachys</i>	small fescue	Poaceae	native	annual grass	UPL
<i>Festuca perennis (Lolium perenne)</i>	rye grass	Poaceae	non-native	annual/perennial herb	FAC
<i>Frangula californica ssp.tomentella</i>	hoary cofeeberry	Rhamnaceae	native	shrub	UPL
<i>Galium aparine</i>	cleavers	Rubiaceae	native	annual herb	FACU
<i>Gastridium phleoides</i>	nit grass	Poaceae	non-native	annual grass	FACU
<i>Geranium dissectum</i>	wild geranium	Geraniaceae	non-native	annual herb	UPL
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	native	annual/perennial herb	FAC
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae	native	shrub	UPL
<i>Hirschfeldia incana</i>	short-podded mustard	Brassicaceae	native	perennial herb	UPL
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	native	perennial grass	FACW
<i>Hordeum marinum</i>	barley	Poaceae	non-native	annual grass	FAC
<i>Hypericum concinnum</i>	gold wire	Hypericaceae	native	perennial herb	UPL
<i>Hypochaeris glabra</i>	smooth cats ear	Asteraceae	non-native	annual herb	UPL
<i>Hypochaeris radicata</i>	hairy cats ear	Asteraceae	non-native	annual herb	FACU
<i>Juglans hindsii</i>	northern California black walnut	Juglandaceae	native	tree	FAC
<i>Juncus acuminatus</i>	tapered rush	Juncaceae	native	perennial herb	OBL
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	non-native	annual herb	FACU
<i>Lathyrus jepsonii</i>	Jepson's pea	Fabaceae	native	annual herb	OBL
<i>Leontodon saxatilis</i>	hawkbit	Asteraceae	non-native	annual herb	FACU
<i>Logfia filaginoides</i>	California cottonrose	Asteraceae	native	annual herb	UPL
<i>Logfia gallica</i>	narrowleaf cottonrose	Asteraceae	non-native	annual herb	UPL
<i>Lonicera interrupta</i>	chaparral honeysuckle	Caprifoliaceae	native	vine/shrub	UPL
<i>Lupinus bicolor</i>	lupine	Fabaceae	native	annual/perennial herb	UPL

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	non-native	annual herb	FAC
<i>Madia exigua</i>	small tarweed	Asteraceae	native	annual herb	UPL
<i>Marah fabacea</i>	California man-root	Cucurbitaceae	native	perennial herb/vine	UPL
<i>Marrubium vulgare</i>	horehound	Lamiaceae	non-native	Perennial herb	FACU
<i>Medicago polymorpha</i>	burclover	Fabaceae	non-native	annual herb	FACU
<i>Melilotus indicus</i>	annual yellow clover	Fabaceae	non-native	annual herb	FACU
<i>Microseris douglasii</i>	Douglas' microseris	Asteraceae	native	annual herb	FACU
<i>Minuartia douglasii</i>	Douglas' sandwort	Caryophyllaceae	native	annual herb	FACU
<i>Pellaea andromedifolia</i>	coffee fern	Pteridaceae	native	perennial	UPL
<i>Pentagramma triangularis</i>	gold back fern	Pteridaceae	native	perennial	UPL
<i>Phyla nodiflora</i>	common lippia	Verbenaceae	native	perennial herb	FACW
<i>Pinus sabiniana</i>	foothill pine	Pinaceae	native	tree	UPL
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	non-native	perennial herb	FAC
<i>Plectritis macrocera</i>	plecritis	Valerianaceae	native	annual herb	FACU
<i>Poa secunda</i>	one-sided blue grass	Poaceae	native	perennial grass	FACU
<i>Quercus lobata</i>	valley oak	Fagaceae	native	tree	FACU
<i>Quercus wislizeni</i>	blue oak	Fagaceae	native	tree	UPL
<i>Ranunculus californicus</i>	buttercup	Ranunculaceae	native	perennial herb	FACU
<i>Rubus ursinus</i>	California black-berry	Rosaceae	native	perennial vine	FAC
<i>Salix laevigata</i>	red willow	Salicaceae	native	tree	FACW
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	native	tree	FACW
<i>Salix exigua</i>	sandbarwillow	Salicaceae	native	tree or shrub	FACW
<i>Sambucus nigra ssp. caerulea</i>	elderberry	Adoxaceae	native	shrub	FACU
<i>Silene gallica</i>	common catchfly	Caryophyllaceae	non-native	annual herb	UPL
<i>Silybum marianum</i>	milk thistle	Asteraceae	non-native	annual/perennial herb	UPL
<i>Sonchus asper</i>	prickly sow thistle	Asteraceae	non-native	annual herb	FAC
<i>Sonchus oleraceus</i>	sow thistle	Asteraceae	non-native	annual herb	UPL
<i>Spergularia rubra</i>	purple sand spurry	Caryophyllaceae	non-native	annual/perennial herb	FAC
<i>Stachys ajugoides</i>	ajuga hedge nettel	Lamiaceae	native	perennial herb	OBL

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Stellaria media</i>	chickweed	Caryophyllaceae	non-native	annual herb	FACU
<i>Symphoricarpos mollis</i>	creeping snowberry	Caprifoliaceae	native	shrub	FACU
<i>Toxicodendron diversilobum</i>	poison oak	Anacardiaceae	native	perennial vine/shrub	FACU
<i>Trifolium sp.</i>	clover	Fabaceae	N/A	annual herb	N/A
<i>Typha sp.</i>	cat tail	Typhaceae	native	perennial herb (aquatic)	OBL
<i>Urtica dioica</i>	stinging nettle	urticaceae	native	perennial herb	FAC
<i>Verbascum blattaria</i>	moth mullein	Scrophulariaceae	non-native	perennial herb	UPL
<i>Veronica anagallis-aquatica</i>	water speedwell	Plantaginaceae	non-native	perennial herb	OBL
<i>Vicia villosa</i>	vetch	fabaceae	non-native	annual herb/vine	UPL
<i>Xanthium strumarium</i>	rough cocklebur	Asteraceae	native	annual herb	FAC

APPENDIX D

PRELIMINARY JURISDICTIONAL DELINEATION REPORT



DELINEATION OF WATERS OF THE U.S.
SAN JOAQUIN COUNTY
BOLLEA ROAD BRIDGE REPLACEMENT PROJECT

JUNE 2017

LEAD AGENCY:

San Joaquin County
1810 East Hazelton Avenue
Stockton, CA 95205



PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479
www.analyticalcorp.com



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NOTE: The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.

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Appendix D	USACE Aquatic Resources Sheet
Appendix E	Natural Resources Conservation Services Soil Survey

LIST OF ABBREVIATED TERMS

APN	Assessor Parcel Number
CA-12	State Route 12
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CWA	Clean Water Act
Delta	San Francisco Bay Delta
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OHWM	ordinary high water mark
RPW	relatively permanent water
RWQCB	regional water quality control board
SWANCC	Solid Waste Agency of Northern Cook County
SWPPP	Stormwater Pollution Prevention Plan
TNW	traditional navigable water
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
°F	degrees Fahrenheit

1.0 INTRODUCTION

A delineation of potential wetlands and other Waters of the U.S. was conducted for the approximately 4.434-acre study area located along Bollea Road at the San Joaquin and Calaveras County, California intersection (study area) on March 8, 2017. This delineation report describes potentially jurisdictional Waters of the U.S. identified within the study area that may be subject to regulation by the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA). The boundaries of Waters of the U.S. depicted in this report represent a calculated estimate of the potentially jurisdictional features within the study area and are subject to modification following the USACE verification process. All results are considered preliminary until the USACE verifies the findings.

1.1 Project Applicant and Agent

Applicant	Agent
County of San Joaquin Department of Public Works 1810 E. Hazelton Avenue Stockton, CA 95201 Phone: (209) 468-3000	Analytical Environmental Services 1801 7th Street, Suite 100 Sacramento, CA 95811 Phone: (916) 447-3479 Fax: (916) 447-1665

1.2 Project Location

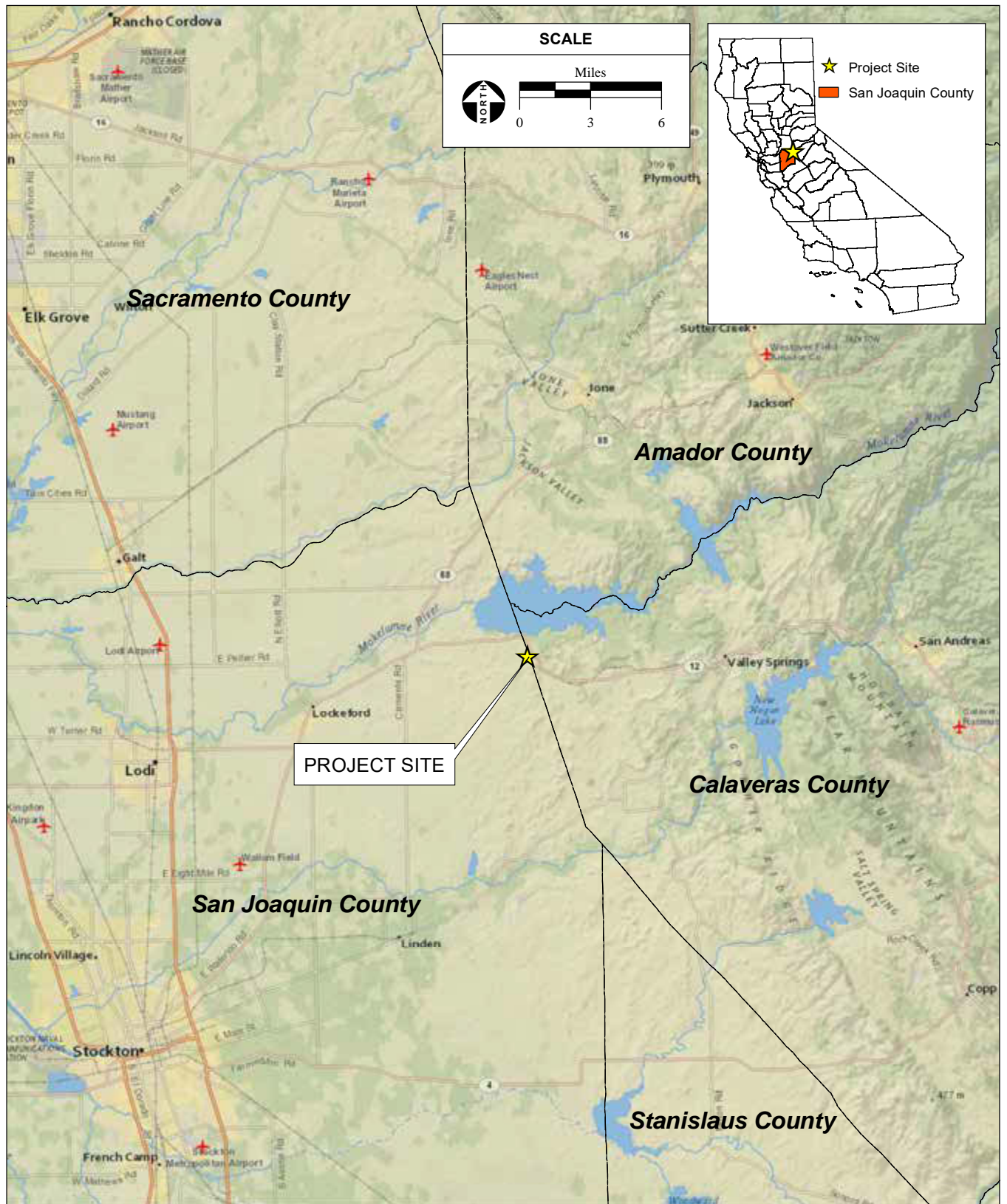
The study area is approximately 4.434 acres and encompasses parts of neighboring parcels of land (Assessor's Parcel Number (APN): 02322011 and 02322012 in San Joaquin County, 48018145 and 48019045 in Calaveras County) and the California Department of Transportation (Caltrans) right-of-way within or adjacent to those parcels. The study area is located along Bollea Road, at the border of San Joaquin and Calaveras County, and is centered roughly at latitude 38° 11' 36.20" N, longitude 120° 58' 57.28" W (**Figure 1**). The study area occurs within Section 16, Township 4 North, Range 9 East, Mount Diablo Baseline and Meridian, on the "Wallace, California" U.S. Geological Survey (USGS) 7.5-minute quadrangle map (USGS, 1965; **Figure 2**). An aerial photograph that illustrates the study area, project footprint and area of potential effects is shown in **Figure 3**.

1.3 Driving Directions

From Lodi, CA take State Route 12 (CA-12) for 39.3 miles east to Bollea Road. Turn right on Bollea Road and drive west for 0.3 miles.

2.0 REGULATORY SETTING

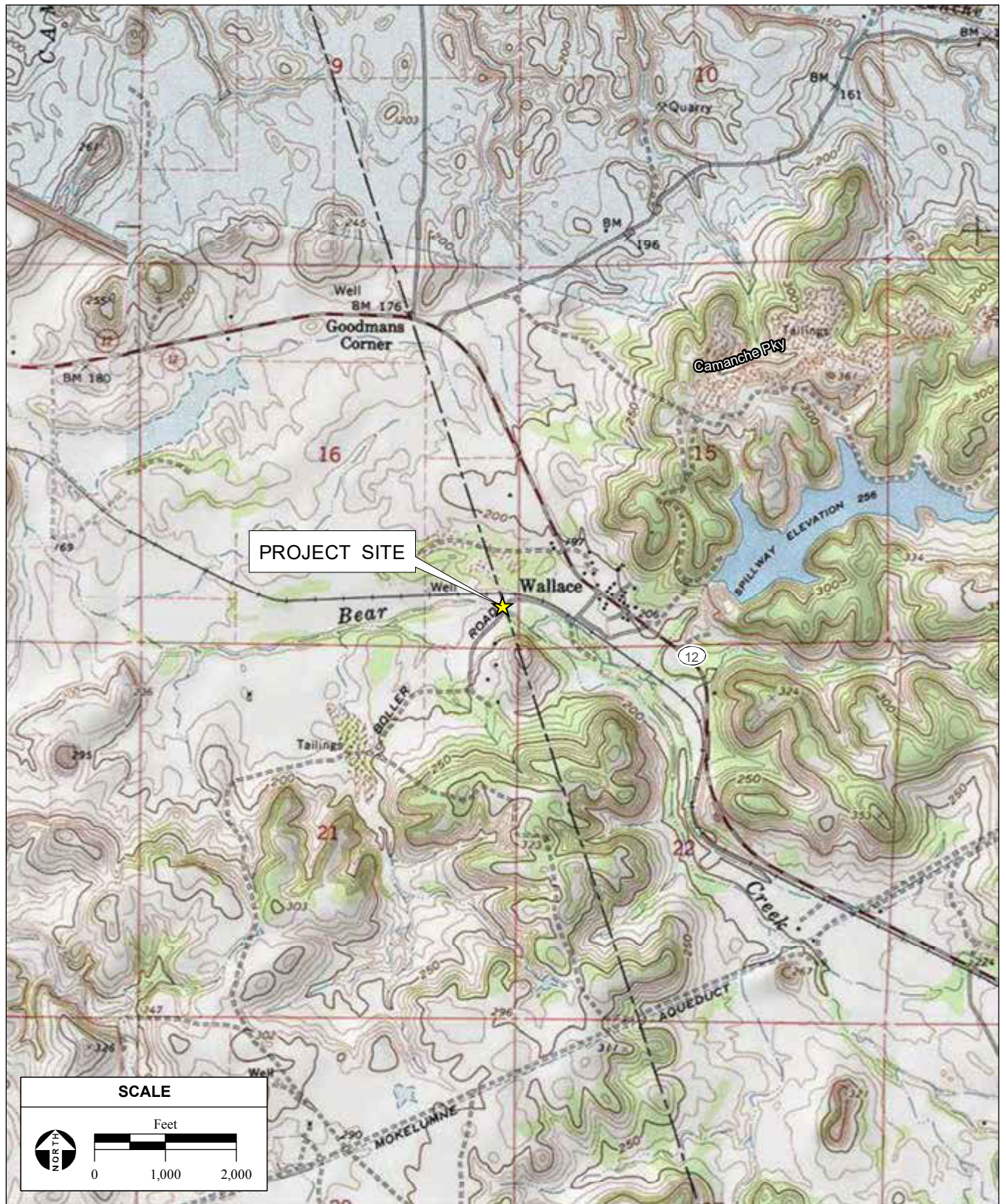
The USACE has primary federal responsibility for administering regulations that concern Waters of the U.S., including wetlands, under CWA Section 404. Section 404 regulates the discharge of dredged and fill material into Waters of the U.S. The USACE requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into



SOURCE: NatGeo 2017; AES, 3/16/2017

Bollea Bridge Preliminary Wetland Report / 215572 ■

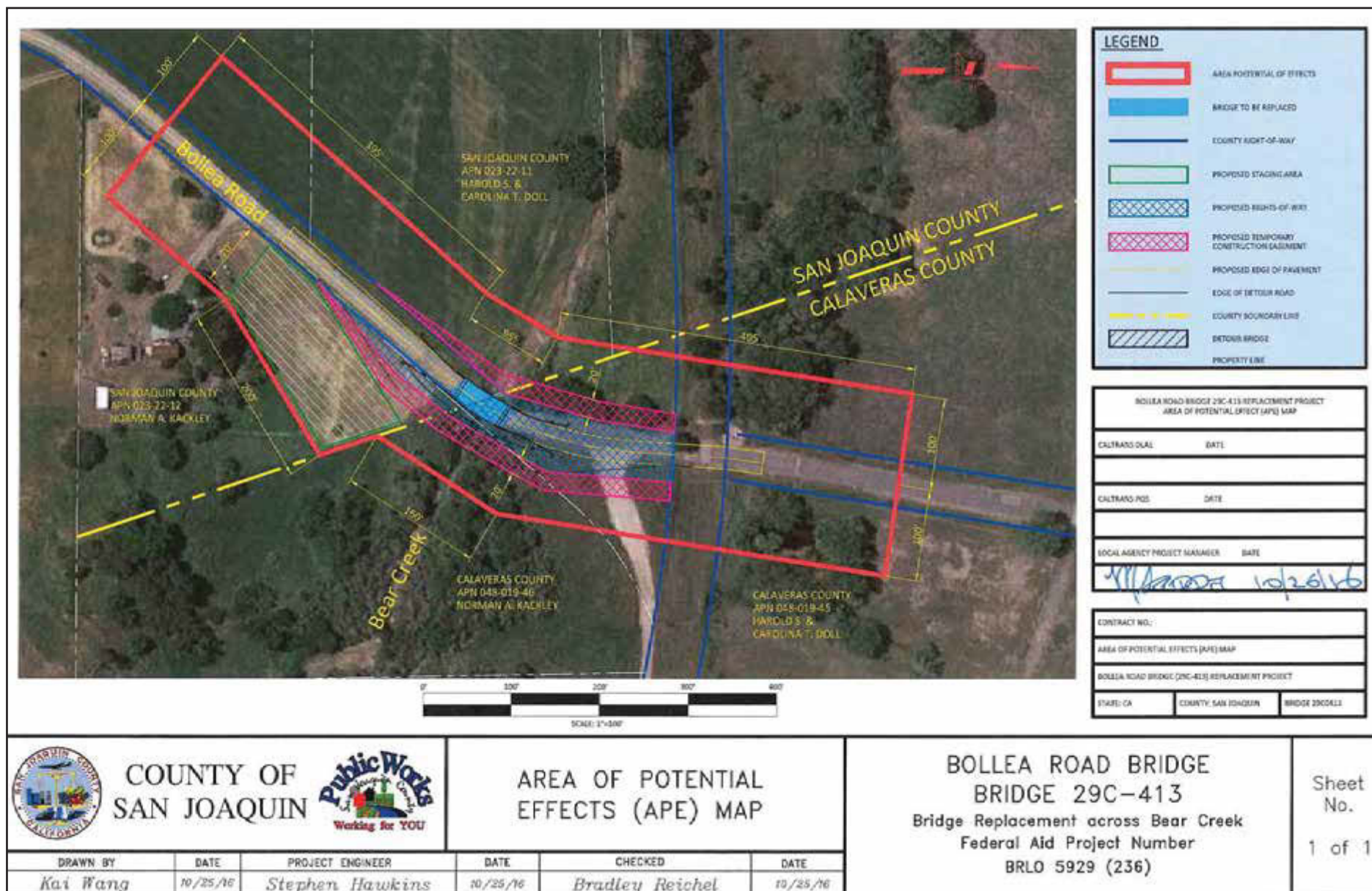
Figure 1
Regional Location



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 10/27/2017

Bollea Bridge Preliminary Wetland Report / 215572 ■

Figure 2
Site and Vicinity



SOURCE: San Joaquin County Public Works, 10/25/2016; AES, 3/16/2017

Bollea Bridge Preliminary Wetland Report / 215572 ■

Figure 3
Aerial Site Map

Waters below the ordinary high water mark (OHWM). The USACE has established a series of nationwide permits (NWP) that authorize certain activities in Waters of the U.S. Wetlands and other water features that lack a hydrologic connection to navigable Waters of the U.S. and that lack a nexus to interstate and foreign commerce are not regulated by the CWA and do not fall under the jurisdiction of the USACE; such features are called “isolated.”

In addition, a Section 401 Water Quality Certification process was established to comply with CWA Sections 301, 302, 303, 306 and 307 and is typically regulated by the applicable Regional Water Quality Control Board (RWQCB) under delegated authority from the U.S. Environmental Protection Agency (EPA). Any applicant proposing to conduct a project that may result in a discharge to U.S. surface waters and/or “Waters of the State,” including wetlands (all types), year-round and seasonal streams, lakes, and all other surface waters, would require a federal permit or water quality certification. At a minimum, any beneficial uses lost must be replaced through a mitigation project of at least equal function, value, and area.

Waters of the U.S. are defined as follows (CWA Section 404; 33 Code of Federal Regulations [CFR] Part 328):

All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters..

The limit of USACE jurisdiction for non-tidal waters (including non-tidal perennial and intermittent watercourses and tributaries to such watercourses) in the absence of adjacent wetlands is defined by the OHWM. The OHWM is defined as follows (CWA Section 404; 33 CFR Part 328):

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 areas.

Wetlands are defined as follows (CWA Section 404; 33 CFR Part 328):

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The USACE and EPA issued the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* on May 30, 2007, to provide guidance based on the U.S. Supreme Court’s decision regarding *Rapanos v. United States* and *Carabell v. United States* (Rapanos decision) [*Rapanos vs. U.S.*, No. 04-1034 (June 19, 2006) and *Carabell vs. U.S.*, No. 04-1384 (September 27, 2004)]; USACE

and EPA, 2007]. The decision provides standards that distinguish between traditional navigable waters (TNWs), relatively permanent waters (RPWs) with perennial or seasonal flows, and non-relatively permanent waters (non-RPWs). Wetlands and non-TNWs adjacent to TNWs are subject to CWA jurisdiction if: (a) the water body is relatively permanent; (b) a water body abuts or is tributary to an RPW; or (c) a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. The significant nexus standard is based on evidence applicable to ecology, hydrology, and the influence of the water on the “chemical, physical, and biological integrity of downstream traditional navigable waters” (USACE, 2008a). Isolated wetlands are not subject to CWA jurisdiction based on the U.S. Supreme Court’s decision regarding the Solid Waste Agency of Northern Cook County (SWANCC decision) [*Solid Waste Agency of Northern Cook County vs. U.S. Army Corps of Engineers*, No. 99-1178, January 9, 2001; U.S. Department of Energy, 2003].

In addition, ditches (including roadside ditches) that are excavated wholly within and drain only uplands and that do not carry a relatively permanent flow of water are generally not considered Waters of the U.S. because they are not tributaries to or have a significant nexus to downstream TNWs (45, 48, and 51 Federal Register Subsections 62732, 62747, 21466, 21474, 41206, and 41217). The December 2008 memorandum summarizing key points of the Rapanos Guidance also states that agencies generally will not assert jurisdiction over ditches (including roadside ditches) that are excavated wholly within and drain only uplands and that do not carry a relatively permanent flow of water (USACE and EPA, 2007).

USACE Regulatory Guidance Letter 07-01 (RGL 07-1), *Practices for Documenting Jurisdiction Under Section 9 & 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA* (USACE, 2007), states that upland swales and erosional features (e.g., gullies, small washes characterized by low-volume, infrequent, and short-duration flow) are generally not Waters of the U.S. because they are not tributaries to or have a significant nexus to downstream TNWs.

3.0 METHODOLOGY

The information presented in this report was prepared in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE, 2008a); *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE, 2016); and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). The boundaries of potential Waters of the U.S. were delineated through standard field methodologies (i.e., paired data set analyses), and all wetland data were recorded on USACE Wetland Determination Forms - Arid West Region (**Appendix C**), and Aquatics Resources Excel worksheets (**Appendix D**). A color aerial photograph was used in the field to assist with the delineation. The *Munsell Soil Color Charts* (Kollmorgen Instruments Co., 1990) were used in the field to identify hydric soils. Plant identification and nomenclature followed *The Jepson Manual: Higher Plants of California* (Hickman, 1993) and the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016). Site photographs of the study area are included as **Appendix A**.

3.1 Delineation

On March 8, 2017, AES biologists Nicholas Bonzey and David Moldoff conducted a delineation of the study area. He walked transects throughout the study area to determine the location of potential Waters of the U.S. Because all potential Waters of the U.S. could be delineated based on OHWM, no paired sample points for wetland determination were collected. The Waters delineated by OHWM followed criteria outlined in the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE, 2008b). Positional data was collected using a global positioning systems (GPS) handheld unit (Trimble GeoXH™) with sub-meter accuracy.

3.2 Routine Determinations

Potential wetlands located within the study area were evaluated based on the following three parameter criteria:

- The majority of dominant plant species are wetland-associated species;
- Hydric soils are present; and
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season.

Other Waters of the U.S. were evaluated based on OHWM characteristics.

3.3 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce soils that are permanently or periodically saturated for sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987). Prevalent vegetation is characterized by the dominant plant species comprising the plant community. The dominance test is the basic hydrophytic vegetation indicator and was utilized at each data point location. The “50/20 rule” was used to select the dominant plant species from each stratum of the vegetation community. This rule states that for each stratum in the community, dominant plant species are the most abundant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional plant species that individually comprise 20 percent or more of the total stratum (USACE, 2008a).

3.4 Soils

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil (Natural Resources Conservation Service [NRCS], 2010). Frequently observed indicators of hydric soils include (but are not limited to) histosols, histic epipedon, hydrogen sulfide, stratified layers, depleted below dark surface, depleted matrix, redox dark surface, depleted dark surface, and redox depressions (USACE, 2008a).

3.5 Hydrology

Wetlands are generally depressions in the landscape that are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include (but are not limited to) visual observation of surface water, high water table, saturation, water marks (non-riverine), sediment deposits (non-riverine), drift deposits (non-riverine), surface soil cracks, inundation visible on aerial imagery, water-stained leaves, salt crust, biotic crust, aquatic invertebrates, hydrogen sulfide odor, and oxidized rhizospheres along living roots. Secondary indicators of wetland hydrology include water marks (riverine), sediment deposits (riverine), drainage patterns, dry-season water table, and crayfish burrows (USACE, 2008a). Observation of at least one primary indicator or two secondary indicators is required to confirm the presence of wetland hydrology for each feature.

4.0 ENVIRONMENTAL SETTING

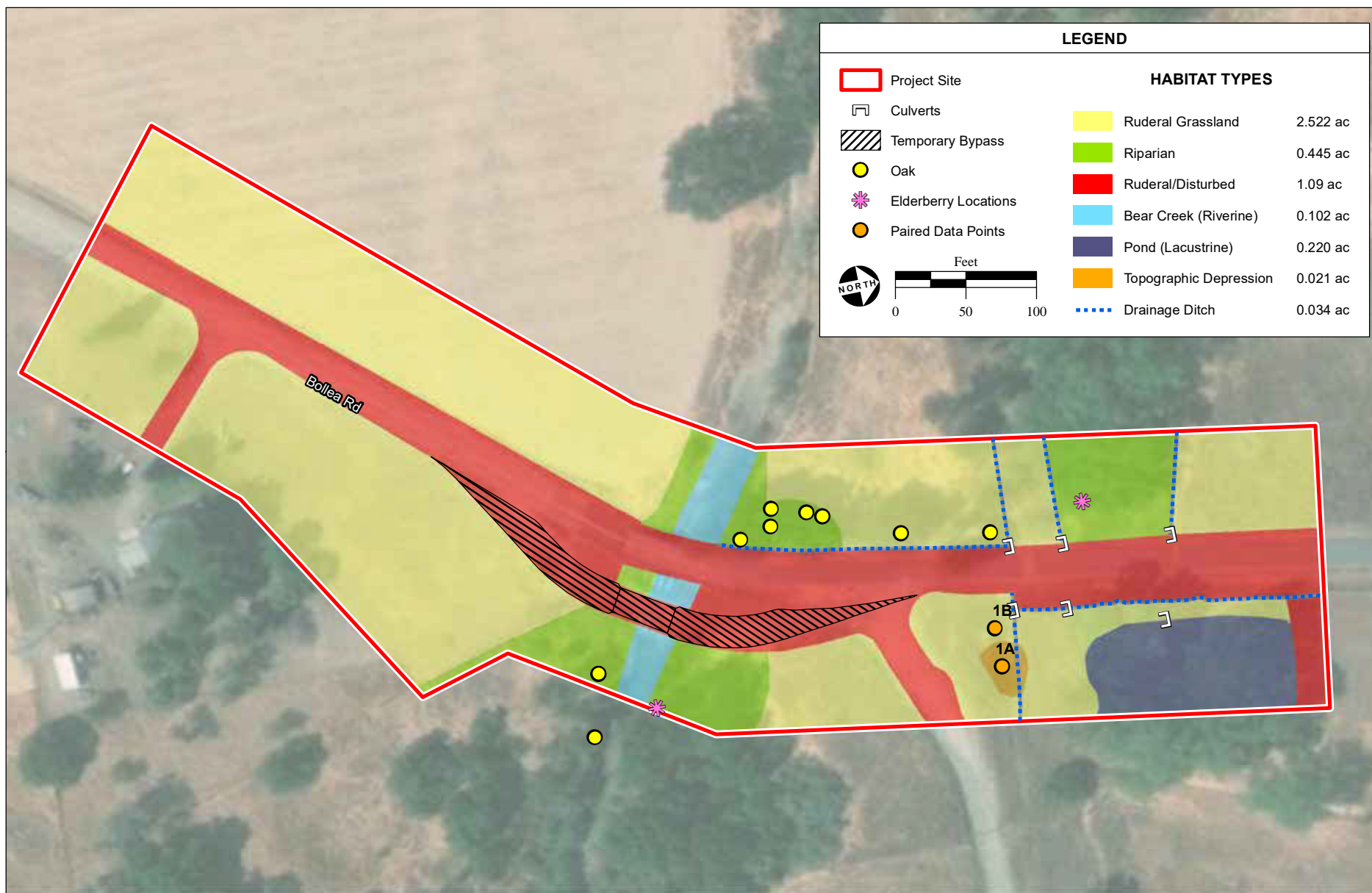
The study area is located on the border of San Joaquin County and Calaveras County within the northern terraces of the Central California Valley. This area has a semi-arid Mediterranean climate regime characterized by hot, dry, sunny summers and cool, rainy winters. Summers are hot and dry with little to no rain, and winters are characterized by foggy days and cooler temperatures. The mean annual temperature range in San Joaquin County is approximately 46 to 75 degrees Fahrenheit (°F). The average annual precipitation range in San Joaquin County is approximately 0 to 3.5 inches, with the maximum usually occurring during the month of January. This climate data was collected from 1980-2010 (The Weather Channel, 2017).

The study area is set among gently rolling terrain and is situated at elevations that range from approximately 180 to 266 feet (55 to 81 meters) above mean sea level. Bear Creek, a tributary to the San Francisco Bay Delta (Delta), flows westward through the study area. Bear Creek enters the Delta via White Slough on the north end of the City of Stockton. The study area falls within Climate Zone 12 (PG&E, 2017). Climate Zone 12 experiences cool winters and hot summers with winter rains typically occur from November to April, and high summer temperatures reaching over 100°F.

The study area is situated in a rural residential/agricultural setting west of the community of Wallace, CA. Surrounding land uses include rural residential, agriculture, and undeveloped open land. The study area is predominantly undeveloped and uncultivated. Several residences and associated structures are located within the study area and include: an agricultural field, a residential development, a dirt roadway, and a disturbed area with a man-made pond.

4.1 Habitat Types

The study area contains a variety of terrestrial and aquatic habitat types. These habitats include: grassland, riparian, ruderal/disturbed, intermittent stream, pond, and a topographic depression. A map that illustrates the terrestrial and aquatic habitat types within the study area is presented as **Figure 4**. Also represented on **Figure 4** are oak trees with a diameter at breast height (dbh) greater than or equal to 5 inches. A complete list of vascular plant species observed within the study area can be found in **Appendix B**. The habitat types are discussed further below.



Grassland

The non-native annual grassland plant community is found in several locations north of the existing bridge. The biological survey occurred outside of the primary blooming period for grassland species. As a result, identification of grassland species was not definitive. However, species typical of this habitat type in this region include *Amsinckia* spp. (e.g., *menziesii*, *tessellata*), *Bromus* spp. (e.g., *hordeaceus*, *diandrus*), *Brachypodium distachyon*, *Lasthenia californica*, *Plantago erecta*, *Festuca microstachys*, *Lotus purshianus*, *Nassella cernua*, and *Plagiobothrys nothofulvus*. No animals were observed within this habitat.

Riparian

Riparian habitat along either side of Bear Creek consists predominately of densely clumped oaks (*Quercus* spp.). A separate span of riparian habitat occurs in the northwestern portion of the site. This riparian habitat is dominated by willows (*Salix* spp.), oaks, and bare ground. Several species of migratory birds were observed in this habitat during the site survey.

Ruderal/Disturbed

Roadside ditches are present throughout the site and connect to those running along either side of Bollea Road. The western ditch along Bollea Road, connects to Bear Creek above the OHWM and is covered in dense vegetation. Northeast of the existing bridge there is a private property that contains a man-made pond and an area of bare ground. A dirt road is also present to the east and connects a private residence to Bollea Road. South of the existing bridge is a row crop field to the west and a residential house and yard to the east. Lastly, at the time of the survey, ongoing construction of a temporary vehicular bypass, approximately 15 feet upstream of the existing bridge, was occurring.

Bear Creek (Riverine)

Bear Creek, a USGS blue-line intermittent stream, passes through the site and flows generally from east to west. A USGS blue-line stream is a water course identified by the USGS as being potentially jurisdictional and must be investigated during preliminary environmental studies. The ordinary high water mark of the stream was delineated based on a drastic change in terrestrial vegetation, sorted coarse substrate, and undercut banks, all indicators of the regular presence of moving water within a riverine system. Within the stream channel, the bed consisted of silt and sand with dispersed cobble. Terrestrial vegetation was absent from the channel except for small amounts of algal mats downstream of the bridge. Aerial imagery and aquatic invertebrates were used to classify the stream as intermittent as water was present within the stream channel during the March 8, 2017 site visit. No fish or other aquatic animals were observed within the habitat.

Pond (Lacustrine)

Approximately 0.220 acres of a man-made pond located on private property is situated on the northeastern portion of the site. The entire pond was fenced and not accessible during the survey. It has raised berms on all sides with overflow culverts that spill into the roadside ditches. Vegetation is dominated by large willows (*Salix* spp.) and a clear OHWM was observed.

Topographic Depression

An approximately 0.021 acre topographic depression, with obvious wetland vegetation, was evaluated for the three parameters required to be considered a wetland (USACE, 2008a). Herbaceous vegetation within the topographic depression passed the dominance test and therefore are considered hydrophytic vegetation (**Appendix C**). A paired data point set was established to evaluate whether the three parameter criteria supported a wetland or upland determination. One point was situated outside the limits of the hydrophytic vegetation and the other point was situated within the hydrophytic vegetation (**Figure 4**). Although the herbaceous vegetation within the topographic depression was determined to meet the criteria as hydrophytic, and wetland hydrology is present (observable surface water), an investigation of the soils revealed that it did not meet any of the hydric soil indicators for the Arid West Region (USACE, 2008a) and therefore is not considered jurisdictional by the USACE. The Wetland Determination Forms for the paired sample points are provided in **Appendix C**.

4.2 Soil Types

According to the NRCS online *Soil Survey of San Joaquin County, California and Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties* (NRCS, 2017), there are three identified soil types mapped within the study area: Acampo sandy loam, 0 to 2 percent slopes; Dumps, tailings, and Pentz sandy loam, 2 to 15 percent slopes. The Acampo and Pentz series contain minor components that are considered hydric. A full NRCS soils report can be found in **Appendix E**.

Acampo sandy loam, 0 to 2 percent slope

The Acampo sandy loam occurs on approximately 70 percent of the study area. This is a moderately, well-drained soil derived from granite. Acampo soils are found in the fan terraces and are considered prime farmland if irrigated.

Dumps, tailings

The dumps and tailings designation is found in 17 percent of the study area. These areas occur throughout the State and most are outwash terraces. Many of the dumps are adjacent to streams and range from 3 to 40 acres.

Pentz sandy loam, 2 to 15 percent slope

The Pentz sandy loam occurs on approximately 13 percent of the study area. This is a well-drained soil formed from weathered basic andesitic, tuffaceous sandstone. Pentz soils are found in hills and are not considered prime farmland.

4.3 National Wetlands Inventory

The USFWS National Wetlands Inventory (NWI) was used to identify any previously mapped aquatic features within the study area (USFWS, 1987). The NWI map depicts Bear Creek as the only aquatic feature within the study area. This feature matches the findings of the March 8, 2017 field visit.

4.4 Local Hydrology

The entire study area is within the Lower Bear Creek watershed. Bear Creek flows westward through natural and man-made irrigation ditches within the valley floor, toward White Slough and then the Delta. Bollea Road is the topographic high point within the study area with stormwater being directed to the roadside ditches. These ditches flow towards and into Bear Creek which represents the topographic low point of the study area.

5.0 RESULTS

5.1 Existing Conditions

The study area is largely disturbed with Bollea Road bisecting the study area and several ruderal/disturbed private properties surrounding the road. The existing concrete bridge and new temporary bypass were also observed within the study area crossing Bear Creek. Vegetation was identifiable to the degree necessary to determine the presence or absence of hydrophytic vegetation. The percent of vegetative cover varied from 100 to 0 percent based on the habitat. Overall, normal hydrologic conditions were present within the study area.

5.2 Potential Waters of the U.S. Occurring Within the Study Area

The only potential Waters of the U.S. identified within the study area are Bear Creek (approximately 0.102 acres; 130 linear feet) and the man-made pond (approximately 0.22 acres) (**Figure 4**).

6.0 DISCUSSION AND ANALYSIS

The entire study area is located within the Lower Bear Creek watershed, a TNW that flows directly into the Delta. Waters of the U.S. located in the study area are depicted in **Figure 4**. USACE Wetland Delineation Forms can be found in **Appendix C** and an USACE Aquatic Resources Excel worksheet is provided in **Appendix D**.

Potential jurisdictional Waters on the site are limited to Bear Creek and the man-made pond.

Bear Creek (Riverine)

Bear Creek is designated a USGS blue-line stream located in the middle of the study area. Approximately 130 linear feet of channel flow through the site with a clearly delineated OHWM on both banks and a bed that contains sorted sediments and a lack of terrestrial vegetation. Approximately 0.102 acres of Bear Creek is within the study area (**Table 1**). Aerial imagery and aquatic invertebrates were used to classify the stream as intermittent as water was present within the stream channel during the March 8, 2017 site visit.

Pond (Lacustrine)

Approximately 0.220 acres of a man-made pond located occurs within the study area (**Table 1**). While the pond is man-made, it is connected to Bear Creek through culverts and roadside ditches. The pond contains a clearly delineated OHWM with internal vegetation dominated by large willows (*Salix* spp.).

TABLE 1
AQUATIC RESOURCES WITHIN THE STUDY AREA

Feature Type	Cowardin Classification	Latitude	Longitude	Size
Bear Creek	Lacustrine (L2)	38.19339000	-120.98257900	0.102 acres
Pond	Riverine (RR)	38.19439900	-120.98207600	0.220 acres

7.0 CONCLUSION

AES conducted a delineation of potential Waters of the U.S. within the 4.434-acre study area on March 8, 2017. Bear Creek and the man-made pond were identified as being potentially jurisdictional under the CWA (**Section 6.0**). Field observations and analysis of local hydrology determined that there is a direct connection from Bear Creek to the Delta, and from the man-made pond to Bear Creek. If the USACE concurs with this preliminary jurisdictional determination for the Waters within the study area, it would have regulatory authority over these features. However, determination of the jurisdictional status of these features is at the discretion of the USACE and would be decided through the verification process. The USACE evaluates jurisdictional determinations for the significant nexus standard, in accordance with the Rapanos and SWANCC decisions, on a site-specific basis.

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APPENDICES

APPENDIX A

SITE PHOTOGRAPHS



PHOTO 1: Grassland – northeast corner of site.



PHOTO 2: Riparian - upstream of existing bridge.



PHOTO 3: Bear Creek – downstream of existing bridge.



PHOTO 4: Topographic Depression – north of existing bridge.



PHOTO 5: Ruderal/Disturbed – south of existing bridge.

Appendix B

List of Vascular Plant Species Observed

Table 1. List of Vascular Plant Species Observed at Bollea Road Bridge Replacement Project on March 8, and July 20, 2017. Wetland Indicator Status were classified according to the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al, 2016).

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Achillea millefolium</i>	yarrow	Asteraceae	native	annual herb	FACU
<i>Achyrachaena mollis</i>	blow wives	Asteraceae	native	annual herb	FAC
<i>Acmispon glaber</i>	deerweed	Fabaceae	native	perennial herb	UPL
<i>Agrostis stolonifera</i>	redtop	Poaceae	non-native	perennial grass	FACW
<i>Amsinckia menziesii</i>	common fiddleneck	Boraginaceae	native	annual herb	UPL
<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	native	perennial herb	FAC
<i>Avena barbata</i>	slender wild oat	Poaceae	non-native	annual grass	UPL
<i>Avena fatua</i>	wild oats	Poaceae	non-native	annual grass	UPL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	native	shrub	UPL
<i>Baccharis salicifolia</i>	mulefat	Asteraceae	native	shrub	FAC
<i>Briza minor</i>	little rattlesnake grass	Poaceae	non-native	annual grass	FAC
<i>Bromus diandrus</i>	ripgut brome	Poaceae	non-native	annual grass	UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	non-native	annual grass	FACU
<i>Bromus madritensis ssp. madritensis</i>	foxtail chess	Poaceae	non-native	annual grass	UPL
<i>Calandrinia menziesii</i>	red maids	Montiaceae	native	annual herb	UPL
<i>Cardamine oligosperma</i>	bitter cress	Brassicaceae	native	annual/perennial herb	FAC
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	non-native	annual herb	UPL
<i>Carex nudata</i>	torrent sedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Ceanothus cuneatus</i>	buckbrush	Rhamnaceae	native	perennial shrub	UPL
<i>Clarkia sp.</i>	clarkia	Onagraceae	native	annual herb	UPL
<i>Croton setiger</i>	turkey-mullein	Euphorbiaceae	native	perennial herb	UPL
<i>Cyperus eragrostis</i>	tall flatsedge	Cyperaceae	native	perennial grasslike herb	FACW
<i>Dactylis glomerata</i>	orchard grass	Poaceae	non-native	perennial grass	FACU
<i>Dichelostemma capitatum</i>	wild hyacinth	Themidaceae	native	perennial herb	FACU
<i>Diplacus aurantiacus</i>	Sticky monkeyflower	Phrymaceae	native	shrub	FACU
<i>Elymus glaucus</i>	blue wildrye	Poaceae	native	perennial herb	FACU
<i>Epilobium ciliatum</i>	slender willow herb	Onagraceae	native	perennial herb	FACW

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Epilobium densiflorum</i>	willow herb	Onagraceae	native	annual herb	FACW
<i>Erigeron canadensis</i>	Canada horseweed	Asteraceae	native	annual herb	FACU
<i>Eriodictyon californicum</i>	yerba santa	Boraginaceae	native	shrub	FACU
<i>Erodium botrys</i>	big heron bill	Geraniaceae	non-native	annual herb	FACU
<i>Erodium cicutarium</i>	red-stemmed filaree	Geraniaceae	non-native	annual herb	UPL
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	native	annual/perennial herb	UPL
<i>Festuca microstachys</i>	small fescue	Poaceae	native	annual grass	UPL
<i>Festuca perennis (Lolium perenne)</i>	rye grass	Poaceae	non-native	annual/perennial herb	FAC
<i>Frangula californica ssp. tomentella</i>	hoary cofeeberry	Rhamnaceae	native	shrub	UPL
<i>Galium aparine</i>	cleavers	Rubiaceae	native	annual herb	FACU
<i>Gastridium phleoides</i>	nit grass	Poaceae	non-native	annual grass	FACU
<i>Geranium dissectum</i>	wild geranium	Geraniaceae	non-native	annual herb	UPL
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	native	annual/perennial herb	FAC
<i>Heteromeles arbutifolia</i>	toyon	Rosaceae	native	shrub	UPL
<i>Hirschfeldia incana</i>	short-podded mustard	Brassicaceae	native	perennial herb	UPL
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	native	perennial grass	FACW
<i>Hordeum marinum</i>	barley	Poaceae	non-native	annual grass	FAC
<i>Hypericum concinnum</i>	gold wire	Hypericaceae	native	perennial herb	UPL
<i>Hypochaeris glabra</i>	smooth cats ear	Asteraceae	non-native	annual herb	UPL
<i>Hypochaeris radicata</i>	hairy cats ear	Asteraceae	non-native	annual herb	FACU
<i>Juglans hindsii</i>	northern California black walnut	Juglandaceae	native	tree	FAC
<i>Juncus acuminatus</i>	tapered rush	Juncaceae	native	perennial herb	OBL
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	non-native	annual herb	FACU
<i>Lathyrus jepsonii</i>	Jepson's pea	Fabaceae	native	annual herb	OBL
<i>Leontodon saxatilis</i>	hawkbit	Asteraceae	non-native	annual herb	FACU
<i>Logfia filaginoides</i>	California cottonrose	Asteraceae	native	annual herb	UPL
<i>Logfia gallica</i>	narrowleaf cottonrose	Asteraceae	non-native	annual herb	UPL
<i>Lonicera interrupta</i>	chaparral honeysuckle	Caprifoliaceae	native	vine/shrub	UPL
<i>Lupinus bicolor</i>	lupine	Fabaceae	native	annual/perennial herb	UPL
<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	non-native	annual herb	FAC

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Madia exigua</i>	small tarweed	Asteraceae	native	annual herb	UPL
<i>Marah fabacea</i>	California man-root	Cucurbitaceae	native	perennial herb/vine	UPL
<i>Marrubium vulgare</i>	horehound	Lamiaceae	non-native	Perennial herb	FACU
<i>Medicago polymorpha</i>	burclover	Fabaceae	non-native	annual herb	FACU
<i>Melilotus indicus</i>	annual yellow clover	Fabaceae	non-native	annual herb	FACU
<i>Microseris douglasii</i>	Douglas' microseris	Asteraceae	native	annual herb	FACU
<i>Minuartia douglasii</i>	Douglas' sandwort	Caryophyllaceae	native	annual herb	FACU
<i>Pellaea andromedifolia</i>	coffee fern	Pteridaceae	native	perennial	UPL
<i>Pentagramma triangularis</i>	gold back fern	Pteridaceae	native	perennial	UPL
<i>Phyla nodiflora</i>	common lippia	Verbenaceae	native	perennial herb	FACW
<i>Pinus sabiniana</i>	foothill pine	Pinaceae	native	tree	UPL
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	non-native	perennial herb	FAC
<i>Plectritis macrocera</i>	plecritis	Valerianaceae	native	annual herb	FACU
<i>Poa secunda</i>	one-sided blue grass	Poaceae	native	perennial grass	FACU
<i>Quercus lobata</i>	valley oak	Fagaceae	native	tree	FACU
<i>Quercus wislizeni</i>	blue oak	Fagaceae	native	tree	UPL
<i>Ranunculus californicus</i>	buttercup	Ranunculaceae	native	perennial herb	FACU
<i>Rubus ursinus</i>	California black-berry	Rosaceae	native	perennial vine	FAC
<i>Salix laevigata</i>	red willow	Salicaceae	native	tree	FACW
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	native	tree	FACW
<i>Salix exigua</i>	sandbarwillow	Salicaceae	native	tree or shrub	FACW
<i>Sambucus nigra ssp. caerulea</i>	elderberry	Adoxaceae	native	shrub	FACU
<i>Silene gallica</i>	common catchfly	Caryophyllaceae	non-native	annual herb	UPL
<i>Silybum marianum</i>	milk thistle	Asteraceae	non-native	annual/perennial herb	UPL
<i>Sonchus asper</i>	prickly sow thistle	Asteraceae	non-native	annual herb	FAC
<i>Sonchus oleraceus</i>	sow thistle	Asteraceae	non-native	annual herb	UPL
<i>Spergularia rubra</i>	purple sand spurry	Caryophyllaceae	non-native	annual/perennial herb	FAC
<i>Stachys ajugoides</i>	ajuga hedge nettel	Lamiaceae	native	perennial herb	OBL
<i>Stellaria media</i>	chickweed	Caryophyllaceae	non-native	annual herb	FACU

SCIENTIFIC NAME	COMMON NAME	FAMILY	ORIGIN	FORM	INDICATOR STATUS
<i>Symphoricarpos mollis</i>	creeping snowberry	Caprifoliaceae	native	shrub	FACU
<i>Toxicodendron diversilobum</i>	poisen oak	Anacardiaceae	native	perennial vine/shrub	FACU
<i>Trifolium sp.</i>	clover	Fabaceae	N/A	annual herb	N/A
<i>Typha sp.</i>	cat tail	Typhaceae	native	perennial herb (aquatic)	OBL
<i>Urtica dioica</i>	stinging nettle	urticaceae	native	perennial herb	FAC
<i>Verbascum blattaria</i>	moth mullein	Scrophulariaceae	non-native	perennial herb	UPL
<i>Veronica anagallis-aquatica</i>	water speedwell	Plantaginaceae	non-native	perennial herb	OBL
<i>Vicia villosa</i>	vetch	fabaceae	non-native	annual herb/vine	UPL
<i>Xanthium strumarium</i>	rough cocklebur	Asteraceae	native	annual herb	FAC

APPENDIX C

USACE WETLAND DETERMINATION FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bolton Rd Bridge Project City/County: San Joaquin Co. Sampling Date: 2017/03/08
 Applicant/Owner: San Joaquin County State: CA Sampling Point: 1A
 Investigator(s): Nicholas Bonzey, David Mulet Section, Township, Range: Sect 16, Township 4N, Range 9 East
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): _____ Lat: 38.194196 Long: -120.98225 Datum: NAD83
 Soil Map Unit Name: Acampo NWI classification: N/A

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 <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: <u>Small depression has hydrophytic vegetation, hydrology conditions but no hydric soil indicators.</u>	

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Shrub/Straw Stratum				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>2</u> x 2 = <u>4</u> FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species <u>1</u> x 5 = <u>5</u> Column Totals: <u>9</u> (A) <u>3</u> (B) Prevalence Index = B/A = <u>9/3 = 3</u>
1. <u>UTR</u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Herb Stratum				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input checked="" type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Juncus acuminatus</u>	<u>60%</u>	<u>D</u>	<u>OBL</u>	
2. <u>Geranium dissectum</u>	<u>10%</u>	<u>D</u>	<u>UPL</u>	
3. <u>Cyperus eragrostis</u>	<u>40%</u>	<u>D</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
Total Cover: <u>110%</u>				
Woody Vine Stratum				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>0</u>		% Cover of Biotic Crust <u>0</u>		
Remarks: <u>Hydrophytic Vegetation present.</u>				

Sampling Point: 1A

HYDROLOGY

Arid West – Version 11-1-2006

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bolton Rd. Bridge Project City/County: San Joaquin Sampling Date: 2017/03/08
 Applicant/Owner: San Joaquin Co State: CA Sampling Point: 1 B
 Investigator(s): Nicholas Bonzey, David Moldoff Section, Township, Range: Sec 16, Township 4N, Range 9 East
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 1%
 Subregion (LRR): _____ Lat: 38.1941 Long: -120.9813 Datum: NAD83
 Soil Map Unit Name: Acumpe NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes _____ No <input checked="" type="checkbox"/>	
Remarks: <u>upland plants, no hydric soil indicators, or wetland hydrology.</u>		

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	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 = _____
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Sapling/Shrub Stratum				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 = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	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 = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
Total Cover: <u>0</u>				
Herb Stratum				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 = _____
1. <u>Avena barbata</u>	<u>40%</u>	<u>D</u>	<u>UPL</u>	
2. <u>Sonchus oleraceus</u>	<u>10%</u>		<u>UPL</u>	
3. <u>Geranium dissectum</u>	<u>10%</u>		<u>UPL</u>	
4. <u>Hirschfeldia incana</u>	<u>10%</u>		<u>UPL</u>	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 = _____
5. <u>Bromus madriensis</u>	<u>30%</u>	<u>D</u>	<u>UPL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	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 = _____
Total Cover: _____				
Woody Vine Stratum				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	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 = _____
Total Cover: <u>100</u>				
% Bare Ground in Herb Stratum <u>5%</u>	% Cover of Biotic Crust <u>0</u>			
Remarks:				

Remarks:

SOIL

Sampling Point: 1B

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			Secondary Indicators (2 or more required)	
Primary Indicators (any one indicator is sufficient)				
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)		<input type="checkbox"/> Water Marks (B1) (Riverine)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)		<input type="checkbox"/> Sediment Deposits (B2) (Riverine)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)		<input type="checkbox"/> Drift Deposits (B3) (Riverine)	
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)		<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)		<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)		<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)		<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Water-Stained Leaves (B9)			<input type="checkbox"/> Shallow Aquitard (D3)	
			<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:				
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks:				

APPENDIX D

USACE AQUATIC RESOURCES SHEET

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Bear Creek	CALIFORNIA	R4		Area	0.102		DELINEATE	38.19339000	-120.98257900	
Pond	CALIFORNIA	L2		Area	0.22		ISOLATE	38.19439900	-120.98207600	

Appendix E

NRCS SOIL SURVEY



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties; and San Joaquin County, California



December 14, 2018

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How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

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Soil Map (Bollea Road Bridge Replacement Project)



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 3, Sep 17, 2018

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 12, Sep 14, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: Feb 14, 2016—Oct 23, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Bollea Road Bridge Replacement Project)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
207	Pentz sandy loam, 15 to 50 percent slopes	0.6	2.9%
1013	Mined Land-Anthraltic Xerorthents complex, 1 to 15 percent slopes	7.1	31.8%
8111	Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex, 0 to 8 percent slopes	4.9	21.9%
Subtotals for Soil Survey Area		12.6	56.6%
Totals for Area of Interest		22.2	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	2.7	12.2%
206	Pentz sandy loam, 2 to 15 percent slopes	0.5	2.1%
207	Pentz sandy loam, 15 to 50 percent slopes	0.9	4.0%
1013	Mined Land-Anthraltic Xerorthents complex, 1 to 15 percent slopes	3.0	13.3%
8111	Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex, 0 to 8 percent slopes	2.6	11.7%
Subtotals for Soil Survey Area		9.7	43.4%
Totals for Area of Interest		22.2	100.0%

Map Unit Descriptions (Bollea Road Bridge Replacement Project)

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the

characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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

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

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

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

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

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

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

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered

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practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

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

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

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties

207—Pentz sandy loam, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2x8l3
Elevation: 160 to 360 feet
Mean annual precipitation: 16 to 21 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 320 to 355 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pentz

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium and/or residuum derived from water-reworked basic tuff

Typical profile

A - 0 to 4 inches: sandy loam
Bw - 4 to 15 inches: sandy loam
Cr - 15 to 25 inches: bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Minor Components

Bellota, sandy loam

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Rock outcrop

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

Redding, gravelly loam

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Pardee, cobbly loam

Percent of map unit: 2 percent
Landform: Eroded fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Miltonhills

Percent of map unit: 2 percent
Landform: Eroded fan remnant sideslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Low Elevation Foothills 18-25 PZ (F018XI200CA)
Hydric soil rating: No

Jenny lind

Percent of map unit: 2 percent
Landform: Erosion remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

1013—Mined Land-Anthraltic Xerorthents complex, 1 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2x4d4

Elevation: 200 to 1,080 feet

Mean annual precipitation: 17 to 28 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 280 to 350 days

Farmland classification: Not prime farmland

Map Unit Composition

Mined land, spoil piles: 70 percent

Anthraltic xerorthents and similar soils: 30 percent

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

Description of Mined Land, Spoil Piles

Setting

Down-slope shape: Convex

Across-slope shape: Convex

Description of Anthraltic Xerorthents

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Mine spoil or earthy fill

Typical profile

^A - 0 to 1 inches: extremely cobbly fine sandy loam

^AC - 1 to 9 inches: extremely cobbly fine sandy loam

^C - 9 to 39 inches: cobbles

Properties and qualities

Slope: 1 to 15 percent

Percent of area covered with surface fragments: 20.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 0.6 inches)

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Ecological site: Miscellaneous - Cannot Be Correlated (R018XI999CA)
Hydric soil rating: No

8111—Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2x4d2
Elevation: 110 to 1,050 feet
Mean annual precipitation: 14 to 26 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 275 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Psammentic haploxerolls and similar soils: 40 percent
Mollic fluvaquents, cobbly, and similar soils: 20 percent
Riverwash: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Psammentic Haploxerolls

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

A - 0 to 14 inches: loamy sand
C - 14 to 49 inches: loamy sand
Bw - 49 to 63 inches: sandy loam
C' - 63 to 79 inches: sand

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 0.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None

Custom Soil Resource Report

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A

Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream (R018XX101CA)

Hydric soil rating: No

Description of Mollic Fluvaquents, Cobbly

Setting

Landform: Flood-plain steps

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium over residuum weathered from metamorphic rock

Typical profile

A - 0 to 2 inches: cobbly loam

Bg - 2 to 6 inches: very gravelly sandy clay loam

C - 6 to 15 inches: very gravelly sandy clay loam

R - 15 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 1.0 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Depth to water table: About 1 to 4 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 7w

Land capability classification (nonirrigated): 7w

Hydrologic Soil Group: D

Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream (R018XX101CA)

Hydric soil rating: Yes

Description of Riverwash

Setting

Landform: Channels

Properties and qualities

Slope: 0 to 3 percent

Frequency of flooding: Very frequent

Minor Components

Anthraltic xerorthents

Percent of map unit: 13 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: Miscellaneous - Cannot Be Correlated (R018XI999CA)

Hydric soil rating: No

Ultic haploxerolls

Percent of map unit: 7 percent

Landform: Meander scars on flood-plain steps

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream
(R018XX101CA)

Hydric soil rating: No

Water

Percent of map unit: 5 percent

Landform: Streams

Hydric soil rating: No

San Joaquin County, California

101—Acampo sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhr0
Elevation: 10 to 150 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Acampo

Setting

Landform: Fan terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 19 inches: sandy loam
Bw - 19 to 47 inches: sandy loam
Bkqm1 - 47 to 49 inches: cemented
Bkqm2 - 49 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan; 43 to 60 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent

Hydric soil rating: No

Devries

Percent of map unit: 4 percent

Landform: Rims

Hydric soil rating: Yes

Unnamed, fine textured subsoil soils

Percent of map unit: 4 percent

Hydric soil rating: No

Tokay

Percent of map unit: 2 percent

Hydric soil rating: No

206—Pentz sandy loam, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2x8l2

Elevation: 160 to 310 feet

Mean annual precipitation: 16 to 22 inches

Mean annual air temperature: 63 degrees F

Frost-free period: 325 to 360 days

Farmland classification: Not prime farmland

Map Unit Composition

Pentz and similar soils: 85 percent

Minor components: 15 percent

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

Description of Pentz

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium and/or residuum derived from water-reworked basic tuff

Typical profile

A - 0 to 4 inches: sandy loam

Bw - 4 to 15 inches: sandy loam

Cr - 15 to 25 inches: bedrock

Properties and qualities

Slope: 2 to 15 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Minor Components

Bellota, sandy loam

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Jenny lind

Percent of map unit: 2 percent
Landform: Erosion remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Peters, clay

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clayey Dissected Swales 14-23 PZ (R018XI164CA)
Hydric soil rating: No

Redding, gravelly loam

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Alamo, clay

Percent of map unit: 2 percent
Landform: Drainageways on fan remnants, depressions on fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: Miscellaneous - Cannot Be Correlated (R018XI999CA)
Hydric soil rating: Yes

Pardee, cobbly loam

Percent of map unit: 2 percent
Landform: Eroded fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Miltonhills

Percent of map unit: 2 percent
Landform: Eroded fan remnant sideslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Low Elevation Foothills 18-25 PZ (F018XI200CA)
Hydric soil rating: No

207—Pentz sandy loam, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2x8l3
Elevation: 160 to 360 feet
Mean annual precipitation: 16 to 21 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 320 to 355 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pentz

Setting

Landform: Hills
Landform position (two-dimensional): Backslope

Custom Soil Resource Report

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium and/or residuum derived from water-reworked basic tuff

Typical profile

A - 0 to 4 inches: sandy loam

Bw - 4 to 15 inches: sandy loam

Cr - 15 to 25 inches: bedrock

Properties and qualities

Slope: 15 to 50 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)

Hydric soil rating: No

Minor Components

Bellota, sandy loam

Percent of map unit: 5 percent

Landform: Hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)

Hydric soil rating: No

Miltonhills

Percent of map unit: 2 percent

Landform: Eroded fan remnant sideslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Low Elevation Foothills 18-25 PZ (F018XI200CA)

Hydric soil rating: No

Jennyland

Percent of map unit: 2 percent

Landform: Erosion remnants

Landform position (two-dimensional): Summit

Custom Soil Resource Report

Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Rock outcrop

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

Redding, gravelly loam

Percent of map unit: 2 percent
Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

Pardee, cobbly loam

Percent of map unit: 2 percent
Landform: Eroded fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thermic Low Rolling Hills 14-20 PZ (R018XI163CA)
Hydric soil rating: No

1013—Mined Land-Anthraltic Xerorthents complex, 1 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2x4d4
Elevation: 200 to 1,080 feet
Mean annual precipitation: 17 to 28 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 280 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Mined land, spoil piles: 70 percent
Anthraltic xerorthents and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mined Land, Spoil Piles

Setting

Down-slope shape: Convex

Across-slope shape: Convex

Description of Anthraltic Xerorthents

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mine spoil or earthy fill

Typical profile

^A - 0 to 1 inches: extremely cobbly fine sandy loam
^AC - 1 to 9 inches: extremely cobbly fine sandy loam
^C - 9 to 39 inches: cobbles

Properties and qualities

Slope: 1 to 15 percent
Percent of area covered with surface fragments: 20.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 0.6 inches)

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Ecological site: Miscellaneous - Cannot Be Correlated (R018XI999CA)
Hydric soil rating: No

8111—Psammentic Haploxerolls-Mollic Fluvaquents-Riverwash-complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2x4d2
Elevation: 110 to 1,050 feet
Mean annual precipitation: 14 to 26 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 275 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Psammentic haploxerolls and similar soils: 40 percent
Mollic fluvaquents, cobbly, and similar soils: 20 percent

Custom Soil Resource Report

Riverwash: 15 percent

Minor components: 25 percent

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

Description of Psammentic Haploxerolls

Setting

Landform: Flood-plain steps

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium

Typical profile

A - 0 to 14 inches: loamy sand

C - 14 to 49 inches: loamy sand

Bw - 49 to 63 inches: sandy loam

C' - 63 to 79 inches: sand

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 0.0 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A

Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream (R018XX101CA)

Hydric soil rating: No

Description of Mollic Fluvaquents, Cobbly

Setting

Landform: Flood-plain steps

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed alluvium over residuum weathered from metamorphic rock

Typical profile

A - 0 to 2 inches: cobbly loam

Bg - 2 to 6 inches: very gravelly sandy clay loam

C - 6 to 15 inches: very gravelly sandy clay loam

R - 15 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Custom Soil Resource Report

Percent of area covered with surface fragments: 1.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 1 to 4 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 7w
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream (R018XX101CA)
Hydric soil rating: Yes

Description of Riverwash

Setting

Landform: Channels

Properties and qualities

Slope: 0 to 3 percent
Frequency of flooding: Very frequent

Minor Components

Anthraltic xerorthents

Percent of map unit: 13 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Miscellaneous - Cannot Be Correlated (R018XI999CA)
Hydric soil rating: No

Ultic haploxerolls

Percent of map unit: 7 percent
Landform: Meander scars on flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Mid Gradient Riparian Complex, 4Th Order Stream (R018XX101CA)
Hydric soil rating: No

Water

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

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Custom Soil Resource Report

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APPENDIX E

LETTER FROM SAN JOAQUIN COUNTY



SAN JOAQUIN
COUNTY
Greatness grows here.



Department of Public Works

Kris Balaji, Director of Public Works

Fritz Buchman, Deputy Director/Development

Michael Selling, Deputy Director/Engineering

Jim Stone, Deputy Director/Operations

Kristi Rhea, Manager of Strategic Initiatives

August 24, 2018

Mr. Trent Wilson
Analytical Environmental Services
Senior Project Manager
1801 7th Street, Ste 100
Sacramento, CA 95811

Hello Mr. Wilson,

Per our recent phone conversation, you asked the County to provide a summary of the Bollea Road Bridge Emergency Repair Project that was constructed in the Spring of 2017.

Due to heavy rainfalls during January and February 2017, California declared San Joaquin County and 52 other of its counties under state of emergency. The 5-year drought stricken county within the valley became over saturated with moisture causing flooding and high intensity water flows at various locations. Among the emergencies the San Joaquin County Department of Public Works (SJCDPW) offices responded to was the Bollea Road Bridge where one of its abutments was undermined because of the immense water flows the structure received.

On February 10, 2017, residents on Bollea Road reported that the bridge was settling at the south abutment. County inspectors responded and discovered that the southern abutment of the bridge settled approximately by 6 inches. Due to public safety concerns, the County inspectors immediately closed the bridge. The inspectors returned three days later, after the high water flow receded and discovered that the bridge had settled an additional 4 inches. During that time, they were also able to access the abutment under the bridge and established that the spread footing type of abutment was approximately 70% undermined. In addition, the water infiltrated behind the footing, leaving voids in the soils.

Due to the fact that the residents had no other vehicular access available, the SJCDPW resolved to take immediate action to return the bridge to service. The County coordinated with engineering consultants, the JOC coordinator, and construction contractor to perform a three-part mitigation.

Part one provided stabilization of the eroded abutment allowing the residents to have pedestrian access and so that future storms would not cause further undermining of the abutment and possible collapse of the structure. The design work included initial assessment, design and construction of the abutment stabilization. The construction work consisted of excavating loose soil around the undermined abutment, forming and pouring concrete under the south bridge footing, drilling and pumping concrete slurry to fill the voids behind the footing, and placing Rock slope protection in front of the new stabilizing block. Part One was constructed from February 15, 2017 thru February 18, 2017 and upon completion, the structure was protected from total failure during the next storm. The residents were able to utilize the bridge for pedestrian traffic only.

Part two concentrated on providing the residents with access for their vehicles and emergency service responders by providing a low water access adjacent to the bridge. The design work included design and construction of a low water crossing providing vehicular access to residents. The construction work included removing the debris within the channel area, placing compacted material approximately one foot under, setting three 48" CMP pipes and one 36" CMP pipe/40-foot long, and placing compacted material approximately two foot over the pipes and on the new approach roadways to provide a 12' wide safe vehicular access. The work was performed between March 4, 2017 and March 15, 2017. Upon completion of this part, residents and emergency services were able to utilize the low water crossing for vehicular traffic. This allowed the residents to utilize their vehicles to obtain supplies, attend doctor appointments, receive propane deliveries, and in general carry on with everyday activities.

Part three was completed to restore the bridge to normal public service. The work included design and construction of a gravity wall attached to existing abutment to stabilize the existing structure and allow vehicular traffic to resume on the bridge. The construction work included excavating an area large enough behind the south abutment of the existing bridge to build the gravity wall. Upon completion of the concrete work, contractor backfilled and compacted the excavated area, shaped the approach roadway to match the settled abutment profile, and repaved the roadway. A layer of 18" minus Rock Slope Protection was to the upstream side of the low water crossing in the channel. The work was performed from June 7, 2017 thru June 20, 2017. Upon completion of this work, residents were able to resume normal two direction vehicular traffic on the bridge.

Due to the fact that a bridge replacement project was scheduled to be constructed within the next couple of years, the bank areas that were sloped to accommodate the temporary low water crossing were elevated to their original height and compacted while leaving the low water crossing in the channel in place for use during the HBP construction. This would reduce the impacts on the environment vs removing and re-installing the pipes during the construction and would reduce replacement project costs.

In September 2016, the County submitted an application for the reimbursement of costs associated with the emergency project to FEMA. The application was reviewed and approved by August 2018.

Please let me know if you need any additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gary Griffith", with a stylized flourish at the end.

Gary Griffith, Project Engineer, San Joaquin County Department of Public Works

APPENDIX F

APPLICATION FOR REIMBURSEMENT

<u>P</u>	
Applicant Name:	Application Title:
SAN JOAQUIN (COUNTY)	SJCOC80 BOLLEA ROAD
Period of Performance Start:	Period of Performance End:
	10-01-2018

Subgrant Application - Entire Application

Application Title: [SJCOC80 BOLLEA ROAD](#)

Application Number:

Application Type: [Subgrant Application \(PW\)](#)

Preparer Information

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Is the application preparer the Point of Contact? No

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 Agency/Organization San Joaquin County, Office of Emergency Services
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 City Stockton
 State CA
 ZIP 95206
 Phone 209-468-2186
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Project Description

Disaster Number: 4308
 Pre-Application Number: PA-09-CA-4308-RPA-0315
 Applicant ID: 077-99077-00
 Applicant Name: SAN JOAQUIN (COUNTY)
 Subdivision:
 Project Number: SJCOC80

Standard Project Number/Title: 399 - Road System Damage
 Please Indicate the Project Type: Improved
 Application Title: SJCOC80 BOLLEA ROAD
 Category: C.ROADS & BRIDGES
 Percentage Work Completed? 99.0 %
 As of Date: 09-30-2017

Comments

Improvements were done at the south approach and the south bridge's pier footing which includes an HMP.

Attachments

Damage Facilities (Part 1 of 2)							
Facility Number	Facility Name	Address	County	City	State	ZIP	Site Previously Damaged?
1	Bollea Road Bridge		San Joaquin		CA		No

Comments

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name
RICHARD BYFIELD	10-04-2017	Map	LOCATION MAP SJCOC80	LOCATION MAP SJCOC80	LOCATION MAP SJCOC80.pdf(1.54 Mb)
RICHARD BYFIELD	10-04-2017	Drawings/Sketches	Sketch for Low Water Crossing 3-3-17	Sketch for Low Water Crossing 3-3-17	Sketch for Low Water Crossing 3-3-17.pdf(121.1 kb)
RICHARD BYFIELD	10-04-2017	Drawings/Sketches	Sketch for Bollea gravity wall	Sketch for Bollea gravity wall	Sketch for Bollea gravity wall.pdf(368.73 kb)
RICHARD BYFIELD	10-04-2017	Additional Information	SOW \$14K Consultant for Engineering Work by MGE	SOW \$14K Consultant for Engineering Work by MGE	SOW \$14K Consultant for Engineering Work by MGE.pdf(190.10 kb)
RICHARD BYFIELD	10-05-2017	Additional Information	Capture Bollea Bridge Information 1	Capture Bollea Bridge Information 1	Capture Bollea Bridge Information 1.JPG(191.23 kb)
RICHARD BYFIELD	10-05-2017	Additional Information	Capture Bollea Bridge Information 2	Capture Bollea Bridge Information 2	Capture Bollea Bridge Information 2.JPG(295.52 kb)
RICHARD BYFIELD	10-05-2017	Additional Information	SJC_Trades_Labor_Institutional_Bargaining_Unit	SJC_Trades_Labor_Institutional_Bargaining_Unit	SJC_Trades_Labor_Institutional_Bargaining_Unit (590.93 kb)
RICHARD BYFIELD	10-11-2017	Additional Information	Signed Emergency Notification-Bollea Rd Bridge	Signed Emergency Notification-Bollea Rd Bridge	Signed Emergency Notification-Bollea Rd Bridge (254.93 kb)
RICHARD BYFIELD	10-11-2017	Photos	Additional Photos	Additional Photos	Additional Photos.pdf(964.13 kb)
RICHARD BYFIELD	10-11-2017	Map	Vic Map	Vic Map	Vic Map.pdf(1.49 Mb)
RICHARD BYFIELD	10-25-2017	Photos	1 PHOTOS for SJCOC80	1 PHOTOS for SJCOC80	1 PHOTOS for SJCOC80.pdf(1016.85 kb)
RICHARD BYFIELD	10-25-2017	Additional Information	SOW for Bollea Road Bridge Access Low-Crossing	SOW for Bollea Road Bridge Access Low-Crossing	SOW for Bollea Road Bridge Access Low-Crossing.docx(13.91 kb)
RICHARD BYFIELD	10-26-2017	Map	Bollea Road Functional Classification System	Bollea Road Functional Classification System	Bollea Road Functional Classification System.doc (151.69 kb)

Facility Name:	Bollea Road Bridge
Address 1:	
Address 2:	
County:	San Joaquin
City:	
State:	CA
ZIP:	
Was this site previously damaged?	No
Percentage Work Completed?	99.00 %
Location:	Bollea Road Bridge, Number 29C04213 Wallace, California GPS: 38.193388, -120.982683

Damage Description and Dimensions:	<p>Severe storms occurred in the County of San Joaquin producing heavy rains that saturated the ground. The torrential rain accompanied by high winds which resulted in damage to the county's improved property such as the Bollea Road Bridge 29C04213. The Applicant owns the facility and has the legal responsibility for maintaining and repairing any damages. The Road is classified as a "Local Road (7)" in the State's Functional Classification System. The reported damages presented site photos shows that from high waters within Bear Creek the south pier of the bridge was undermined causing the bridge approximately 10 IN. This made the bridge impassable. The Bollea steel bridge at Bear Creek measures: 56.4 FT in length span length between the two piers measuring: 53.8 FT. The bridge width measures: 19.4 FT. The bridge was constructed for Emergency work, addressed within the Category B work removed debris.</p> <p>Damages consisted of the southern buttress sinking 10 IN at the southeast corner. The headwall buttress pier supporting end of the bridge measures roughly 20 FT in roadway width X approximately 4 FT in roadway length and 10 FT in Height</p> <p>Program Delivery Manager (PDMG) was unable to verify and quantify the extent of the damages. However, the work in the sketches meshes with the work proposed within the supporting documents provided. Therefore the damage description and dimensions estimated based on the visible repairs done and planned to be done. See the photos and sketch for details and location with GPS.</p> <p>The GPS coordinates (38.193388, -120.982683) was taken at the southeast Bollea Road bridge deck.</p> <p>The project address items number 6, 7, and 8 from the applicants LOP.</p>
	<p>WORK COMPLETED</p> <p>BOLLEA ROAD BRIDGE</p> <p>The Bollea Road Bridge, Number 29C0413, south pier was inundated with high storm water that caused the pier to be undermined and settle approximately 10 IN below the approaching roadway. To return the Bollea Road Bridge to service the San Joaquin County prepared three phases of work. Phase I) construct a bypass roadway to permit access to property traveled by residents during repairs and construction as this road is the only vehicle access. Phase II) Add a headwall to the Bear Creek side of the pier to buttress the pier from future creek water flows. And Phase III) construct a southern buttress to the south pier, the bridge approach, to strengthen the pier and aid in maintaining pier stability.</p> <p>Repairs:</p> <p>Phase I) Construction of the bypass roadway for access during construction work:</p> <ol style="list-style-type: none"> 1) Road clearing: that measures 285 FT in length X 16 FT in width X an average of 1 FT in depth = 4,560 CF of soil /27 169 CY X 1.3 Ton/CY = 220 TON. 2) The placement of culverts at the Bear Creek was three (3) 48 IN Diameter CMC and one (1) 36 IN Diameter CMC and measured 40 FT in length. Therefore Three (3) 48 IN diameter culverts at 40 FT in length = 120 FT. And One (1) 36 IN diameter culvert at 40 FT in length = 40 FT. 3) The roadway rock for the road base measures 285 FT in length X 15 FT in roadway width X 8 IN in roadway depth = 120 CF /27 CF/CY = 105 CY X 1.3 TON/CY = 137 TON. 4) The rock base material at the culverts measures 40 FT in roadway length X 25 FT in roadway culvert width x 5 FT in depth = 5,000 SF /27 CF/CY = 186 CY less the culvert area that measures for the 3 – 48 IN culverts, pi X the radius, 2 FT X 3.14 X 40 FT in length of culvert plus 1 – 36 IN culvert, pi X the radius, 1.5 FT X 3.1416 = 4.7124 CF X 40 FT in length of culvert subtracts 943 CF. Therefore the aggregate placed is 186 CY – 35 CY = 151 CY X 1.3 TON/CY = 197 TON. 5) The roadway soil surface material measures 215 FT in roadway length X 15 FT in roadway width X 1 FT in depth = 4 CF /27 CF/CY = 159 CY X 1.7 TON/CY = 271 TON. 6) The roadway aggregate placed measures 285 FT in length X 15 FT in roadway width X 4 IN in depth = 1,411 CF /27 53 CY X 1.3 TON/CY = 69 TON. <p>Phase II) Pier repairs, Bear Creek side of the pier – new headwall to bolster support of the pier against future water flow.</p> <ol style="list-style-type: none"> 1) The new headwall measures at the face of the pier 20 FT in roadway pier width by 18 IN in headwall thickness X 4 FT in height = 120 CF /27 CF/CY = 5 CY X 2 TON/CY = 10 TON. 2) There are two added wing walls that measure two (2) x the 4 FT extended headwall length X 18 IN in headwall thickness X 4 FT in headwall height = 48 CF /27 CF/CY = 2 CY X 2 TON/CY = 4 TON. Total: 5 CY + 2 CY = 7 CY X 2 TON/CY = 14 TON concrete. 3) Reinforcing bar for the new headwall is calculated based on 4 lineal feet of rebar per square foot of headwall construction measures 28 FT in length X 4 FT in height = 112 SF X 4 LF/SF = 448 LF of rebar. 4) Connecting dowel rods to secure the headwall to the existing pier. The number of rods is 19 and each are 1 FT in length. These are number 5 rebar dowels. Total length is 19 X 1 FT = 19 LF. 5) Pins to connect the new headwall to the existing bridge pier = 19 pins placed 1 FT on center x 1.5 FT in length = 29 LF 6) The surface area of the headwall was buttressed with rip-rap that measured approximately 8 IN in diameter for the end surface area of the headwall: 28 FT in length X the 4 FT in height X 1.5 FT in depth = 168 CF of rip-rap /27 CF/CY = 7 CY X 1.3 TON/CY = 10 TON. 7) The roadway path cut into the hillside to bring materials to the headwall measures 30 FT in length X 7 FT in width X 1 FT in depth = 315 CF /27 CF/CY = 12 CY X 1.3 TON/CY = 16 TON. <p>Phase III) OPTION A – In-Kind Repairs – Approach to Sunken Bridge</p> <p>Demolition:</p> <ol style="list-style-type: none"> 1) Asphalt removal: 6 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 30 CF /27 CF/CY = 2 CY X 1.3 TON/CY = 4 TON. 2) Aggregate removal: 6 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 79 CF /27 CF/CY = 3 CY X 1.3 TON/CY = 4 TON. 3) Soil Removal: 6 FT in roadway length X 20 FT in roadway width X 3 FT in depth = 360 CF /27 CF/CY = 14 CY X 1.3 TON/CY = 19 TON. <p>New Construction:</p>

Scope of Work:

- 1) Asphalt installation: 6 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 30 CF /27 CF/CY = 2 CY TON/CY = 4 TON.
- 2) Aggregate installation: 6 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 79 CF /27 CF/CY = 3 CY TON/CY = 4 TON.
- 3) Soil installation: 6 FT in roadway length X 20 FT in roadway width X 2 FT in depth = 240 CF /27 CF/CY = 9 CY X 1.3 TON/CY = 12 TON.
- 4) The guardrail posts place at 3 FT intervals on both sides of the 6 roadway = 6.
- 5) The guardrail measures two X 6 FT = 12 LF.
- 6) Roadway center line paint striping measures 6 LF.

Phase III) OPTION B -- South Approach Retaining Wall - Actual Repairs by San Joaquin County

South approach retaining wall

Part 1) Excavation of removal of roadway and earth

- 1) Demolition of the existing roadway asphalt material: 19 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 95 CF /27 CF/CY = 4 CY X 1.9 TON/SF = 8 TON.
- 2) Demolition of the existing roadway base: 19 FT in roadway length X 20 FT in roadway width X 0.66 FT in material depth = 125 CF /27 CF/CY = 10 CY X 1.3 TON/CY = 13 TON.
- 3) Excavation of the earth to permit the retaining wall to be constructed: A) Pit, 19 FT in length X 20 FT in width X 11 FT in depth = 4,180 CF /27 CF/CY = 155 CY X 1.3 TON/CY = 201 TON; and B) Pit embankment, 19 FT in length X 5.5 FT in width X 1 FT in depth = 1,150 CF /27 CF/CY = 43 CY X 1/3 TON/CY = 56 TON; Total is 155 CY + 43 CY = 198 CY X 1.3 TON/CY = 258 TON.

Part 2) Construction of the Retaining Wall

- 1) Concrete Slab – 15.33 FT in length X 20 FT in width X 2 FT in thickness = 614 CF /27 CF/CY = 23 CY X 2.0 TON/CY = 46 TON.
- 2) Concrete Wall – 8 FT in Height X 20 FT in width X 2 FT in thickness = 320 CF /27 CF/CY = 12 CY X 2.0 TON/CY = 24 TON.
- 3) Concrete Bracing Walls: Part A) 13.33 FT in length X 1 FT in height X 1 FT in width = 14 CF /27 CF/CY = 1 CY; and length X 7 FT in width X 1 FT in thickness = 7 CF /27 CF/CY = 1 CY; and 7 FT in length X 12.33 FT X 1 FT in thickness. 1 CY + 1 CY + 4 CY = 6 CY X 2.0 TON/CY = 12 TON.
- 4) Therefore, the Total Concrete work = Slab, 23 CY, plus Wall, 12 CY, plus Bracing walls, 1 CY + 1 CY + 4 CY = 41 CY X 2.0 TON/CY = 82 TON.
- 5) Reinforcing bar for the new retaining wall is calculated based on 4 lineal feet of rebar per square foot of headwall cor This measures per the engineered drawings 617 SF X 4 LF/SF = 2,592 LF of rebar.
- 6) Reinforcing bar connectors from the retaining wall to the building pier are anchored 24 IN vertically and 12 IN horizontal represents a grid county of 90 connectors at 1.5 FT per connector = 1,350 LF of reinforcing bar.

Part 3) Infill Roadway

- 1) The soil fill measured first by the removal at 189 CY less the volume of the concrete work at 41 CY. The net replace new soil is 189 CY - 41 CY = 157 CY X 1.3 TON/CY = 205 TON.
- 2) The aggregate placement is 19 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 251 CF /27 CF/CY X 1.3 TON/CY = 13 TON.
- 3) The asphalt material measures 19 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 95 CF /27 CF/CY X 1.9 TON/CY = 8 TON.
- 4) The guardrail posts place at 3 FT intervals on both sides of the 19 roadway = 14.
- 5) The guardrail measures two X 19 FT = 38 LF.
- 6) Roadway center line paint striping measures 19 LF.
- 7) Sod grass seed was placed along the bypass roadway for erosion and turbidity protection as the bypass roadway is permit future bridge repair work: 285 FT in Length x 16 FT in roadway width plus 4 additional FT for both sides to stabilize embankment = 24 FT in width X ½ IN in depth = 285 CF /27 CF/CY = 11 CY.

To contract for the work, the San Joaquin County Contractor retained a contractor using the County's Job Order Contract retained an engineering firm already under an annual agreement. The Force Account Labor and Equipment within San Joaquin County to direct the engineering preparation work and direct the Job Order Contract work. The Force Accounts are in-house engineering services to determine and direct the proposed engineering and direction of the work performed by the consultant job order contractor and equipment to travel to the project site.

Labor Hours – 9007: 675.49 Hours;

Equipment Hours – 9008: 134.5 Hours;

Contracts – 9003

Consultant Agreement: MGE Engineering: Emergency engineering services for Bollea Road Bridge.

PHASE I) Construction of the access roadway: On-Site Detour, San Joaquin County, Department of Public Works.

PHASE II) Pier repairs, Bear Creek side of the pier – new headwall to bolster support of the pier against future water flow San Joaquin County, Department of Public Works.

PHASE III) South approach retaining wall, San Joaquin County, Department of Public Works.

PROJECT NOTES:

Calculations are rounded up to the nearest whole number.

Invoices: To date, the applicant has not provided an invoice. Only contracts with a not to exceed amount have been provided.

The FEMA Equipment worksheet was not functioning so the FEMA codes and unit costs were provided in the comments of the equipment worksheet.

Conversion Factor for Concrete measurement: 2.0 TONS per cubic yard.

The JOC attachment were submitted to show how the Applicant procured and selected the Job Order Contractors with state material unit pricing.

NOTES:

VALIDATION OF SUBGRANTEE COST ESTIMATES

The Subgrantee provided the estimate for this site and FEMA validated the estimate and found it to be reasonable for the work performed. The cost of work to be completed was estimated by using the San Joaquin County Department of Public Works bid price and historical cost as well as RS Means.

CEF - This large project was estimated using the Cost Estimating Format (CEF).

COST BASIS FOR LABOR, EQUIPMENT AND MATERIALS: Costs used to formulate this project were based on:

Unit Costs provided by Applicant

RS Means cost estimating guide

Local material cost

The FEMA PDGM used FEMA cost codes / RS MEANS to establish a fair & reasonable cost for this Bollea Road Bridge project.

LARGE PROJECTS - This is a large project and final funding will be based on actual costs incurred by the applicant for all eligible work specifically approved in the scope of work for this project. 44 CFR 206.203.1 states "Federal funding shall be based on the Federal share of actual costs documented by the grantee."

75% FEDERAL FUNDING: In accordance with 44 CFR 206.47(a) and current disaster declaration determinations, this project worksheet will be funded with the Federal Cost share at 75% of all eligible costs.

By accepting this grant the Applicant to the best of their ability acknowledges that all damages described within this Subgrant Application and all associated costs being claimed were a direct result of the declared event, and in connection with the time period of 2-1-2017 to 2-23-2017.

The Applicant has been advised by FEMA PDGM and/or the Project Specialist that in the seeking of proposals and letting contracts for eligible work, the applicant must comply with their local state and/or federal procurement laws, regulations and procedures. Federal funding is contingent upon applicant acquiring all necessary federal, state and local permits. Non-compliance with this requirement may jeopardize the receipt of federal funds.

PROCUREMENT - As a condition of receiving FEMA financial assistance, the Applicant acknowledges that it must comply with procurement standards and requirements set forth in 2 C.F.R. §§ 200.317-200.326 when soliciting and awarding contract for FEMA financial assistance. The Applicant must manage and administer its FEMA grant funds in compliance with applicable requirements.

PROFESSIONAL SERVICES- Additional costs for professional services relating to this scope of work may be considered for funding on a case-by-case basis.

Approval will be based on the merit of supporting documentation attached to the Subgrantee's request.

The legal authority upon which the need is based and cost reasonableness.

STATE PERMITS / CODES AND STANDARDS-
FEDERAL FUNDING IS CONTINGENT UPON THE APPLICANT ACQUIRING ALL NECESSARY FEDERAL, STATE AND LOCAL PERMITS. NON-COMPLIANCE WITH THIS REQUIREMENT AND FAILURE TO FOLLOW AND MEET LOCAL CODES AND STANDARDS, MAY JEOPARDIZE THE RECEIPT OF FEDERAL FUNDS. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO THE COMMENCEMENT OF WORK. COPIES OF PERMITS SHOULD BE RETAINED WITH THE PROJECT FILES FOR CLOSEOUT RECONCILIATION.

AUDIT STATEMENT: All documentation related to this project worksheet is subject to audit and must reflect disaster – regional and project – specific cost. The applicant has been advised of responsibility to maintain supporting documentation (record type of records to be maintained is specified in FEMA policy 2 CFR Subpart F, Audit Requirements. Records must be maintained for three (3) years from the date the last project was completed or from the date final payment was received, whichever is later.

FEDERAL AID ROADS: Program Delivery Manager has validated that none of the sites in this project are listed on the Federal Functional Classification System as Major Collectors, Minor Arterials, Principal Arterials, or Interstate, receiving federal funding. Utilizing the website http://dot.ca.gov/hq/tsip/hseb/crs_maps/index.php

ROAD PROJECTS (FIRMette Requirement): Any road being repaired to pre-disaster design, function, capacity that does include a hazard mitigation proposal, will not require a FIRMette. If any work to repair the road requires work outside the footprint a FIRMette will be required.

RECORD RETENTION: As described in 2 CFR 200.33 Subgrantee must maintain all work-related records for a period of years from Subgrantee closure (final payment), all records relative this project worksheet are subject to examination and the State, FEMA and the Comptroller General of the United States and must reflect work related to disaster specific costs

PROCUREMENT: The Applicant was advised by FEMA PDMG and/or Project Specialist that in the seeking of proposals of contracts for eligible work, the Applicant must comply with its Local, State and/or Federal procurement laws, regulation procedures as required by 2 CFR 317-326

PERMITS: Federal Funding is contingent upon acquiring all necessary Federal, State and Local permits. Noncompliance requirement may jeopardize the receipt of federal funds. The applicant is responsible for obtaining all required permits prior commencement of work. Copies of permits should be retained in the project files for closeout reconciliation.

ENVIRONMENTAL AND HISTORIC PRESERVATION: Applicant must comply with all applicable environmental and historic preservation laws. Federal funding is contingent upon acquiring all necessary Federal, State and Local permits. Noncompliance with this requirement may jeopardize the receipt of federal funds.

DIRECT ADMINISTRATIVE COSTS - The subgrantee is requesting direct administrative costs that are directly chargeable to specific project. Associated eligible work is related to administration of the PA project only and in accordance with 44 CFR 206.252 and 206.253. If applicable, an insurance determination will be made either as anticipated proceeds or actual proceeds in accordance with the applicant's insurance policy which may affect the total amount of the project. Approval of this project in an obtain/maintain insurance requirement. The Subgrantee must comply with insurance reviewer terms and conditions receipt of sub-grant from the State.

INSURANCE - As a condition of receiving permanent work Public Assistance funding the subgrantee is required to obtain and maintain insurance that is reasonably available, adequate and necessary to protect against future loss from a similar event.

INSURANCE REVIEW: The applicant is aware that all projects are subject to an insurance review as stated in 44 C.F.R. 206.252 and 206.253. If applicable, an insurance determination will be made either as anticipated proceeds or actual proceeds in accordance with the applicant's insurance policy which may affect the total amount of the project. Approval of this project in an obtain/maintain insurance requirement. The Subgrantee must comply with insurance reviewer terms and conditions receipt of sub-grant from the State.

ACTUAL COSTS - FEMA and State staff have reviewed the documentation and costs provided by the applicant in support of project and based on that review, the costs appear to meet the minimum eligibility standards.

INELIGIBLE - The applicant may appeal this determination through the Grantee's Office within 60 days of notification of the determination as stated in Title 44 CFR 206.206. The appeal must include supporting documentation and reference applicable regulations.

ATTACHMENTS

LOCATION MAP SJCOC80.pdf

Sketch for Low Water Crossing 3-3-17.pdf

Sketch for Bollea gravity wall.pdf

SOW \$14K Consultant for Engineering Work by MGE.pdf

Capture Bollea Bridge Information 1.JPG

Capture Bollea Bridge Information 2.JPG

SJC_Trades_Labor_Institutional_Bargaining_Unit.pdf

Signed Emergency Notification-Bollea Rd Bridge.pdf

Additional Photos.pdf

Vic Map.pdf

1 PHOTOS for SJCOC80.pdf

SOW for Bollea Road Bridge Access Low-Crossing.docx

Bollea Road Functional Classification System.docx

FIRM.docx

Bollea gravity wall dwgs.pdf

Phase 3 Contract \$162K Abut repair documents.pdf

PO 47112 \$14K for MGE Applicant Consultant Engineer.PDF

SJC_DAC_SJCOC80.xlsx

PW ref SJCOC80 10 5 17.xlsm

PW ref SJCOC80 Force Account Summary.pdf

PW ref SJCOC80 Payroll Data.pdf

PW ref SJCOC80 Labor.pdf

PW ref SJCOC80 Equipment Inventory.pdf

PW ref SJOCOC80 Equipment.pdf PW ref SJOCOC80 Contracts.pdf JOC Contracts - Advertise.pdf JOC Contracts - Award.pdf SJCDPW-RFP-15-01 Justification.pdf FINAL CEF Estimate SJOCOC80 Bolleo Road Bridge 10.11.17.xlsm Mitigation Calculation FINAL CEF ESTIMATE.xlsx Calculation Worksheet for Bollea Road Bridge used to determine the SOW Qty .xlsx On-Site Detour Estimate.pdf Gravity Wall Estimate.pdf Recalculation of Estimated Bollea Road Project Cost.xlsx SJC Excess Insurance Property Coverage Documents FY 17-18.pdf					
Hazard Mitigation Proposal					
* Is effective mitigation feasible on this site?					Yes
If you answered Yes to the above question, the next question is required					
Will mitigation be performed on this site?					Yes
If you answered Yes to the above question, the next question is required					
Do you wish to attach a Hazard Mitigation Proposal?					Yes
If you answered Yes to the above question, the next two questions are required					
Please provide the Scope of Work for the estimate: (maximum 4000 characters)					See HMP tab for details.
Would you like to add the Hazard Mitigation Proposal as a cost line item to the project cost?					No
GIS Coordinates					
Project Location		Latitude		Longitude	
Bollea Road Bridge Number 29C04213		38.193388		-120.98268	
Special Considerations					
1. Does the damaged facility or item of work have insurance coverage and/or is it an insurable risk (e.g., buildings, equipment, vehicles, etc)?					No
If you would like to make any comments, please enter them below. (maximum 4000 characters) CAT C Facility is Bollea Bridge southeast approach to the Pier Footing Repair. They are not an insurable risk.					
2. Is the damaged facility located within a floodplain or coastal high hazard area and/or does it have an impact on a floodplain or wetland?					Yes
If you would like to make any comments, please enter them below. (maximum 4000 characters) Facility is located in San Joaquin valley. FIRMETTE # 06005C0650F, The facility is located within ZONE A.					
3. Is the damaged facility or item of work located within or adjacent to a Coastal Barrier Resource System Unit or an Otherwise Protected Area?					No
If you would like to make any comments, please enter them below. (maximum 4000 characters) No the Facility is located in San Joaquin valley 50 miles from the coast					
4. Will the proposed facility repairs/reconstruction change the pre-disaster conditions (e.g., footprint, material, location, capacity, use of function)?					Yes
If you would like to make any comments, please enter them below. (maximum 4000 characters) The bridge southwest corner decking sank 10 IN, due to undermining of the pier from high water. The SOW plans are to rebuild the bridge approach to match the new lower deck level. This r height of the bridge clearance by 10 IN.					
5. Does the applicant have a hazard mitigation proposal or would the applicant like technical assistance for a hazard mitigation proposal?					Yes
If you would like to make any comments, please enter them below. (maximum 4000 characters) See SOW Phase III) South Approach Retaining Wall for details.					
6. Is the damaged facility on the National Register of Historic Places or the state historic listing? Is it older than 50 years? Are there more, similar buildings near the site?					No
If you would like to make any comments, please enter them below. (maximum 4000 characters) Cat C Facility is Bollea Bridge southeast approach to the Pier Footing Repair. It is not on the National Register of Historic Places or the State list.					
7. Are there any pristine or undisturbed areas on, or near, the project site? Are there large tracts of forestland?					No
If you would like to make any comments, please enter them below. (maximum 4000 characters) Cat C Facility is Bollea Bridge southeast approach to the Pier Footing Repair located in San Joaquin valley setting. No pristine or undisturbed areas exist on or near the site. The area has m no large tracts of forestland are proximate.					
8. Are there any hazardous materials at or adjacent to the damaged facility and/or item of work?					No
If you would like to make any comments, please enter them below. (maximum 4000 characters) NO Hazardous materials can be found. Nor has any been identified at or adjacent to the damaged facility.					
9. Are there any other environmental or controversial issues associated with the damaged facility and/or item of work?					Yes
If you would like to make any comments, please enter them below. (maximum 4000 characters) Environmental issues are associated with the damaged facility because the item of work takes place at the Bear Creek and the Bollea Road Bridge pier.					
Attachments					
User	Date	Document Type	Description	Hard Copy File Reference	File Name
RICHARD BYFIELD	10-03-2017	Floodplain	FIRM	FIRM.docx	FIRM.docx(3.88 Mb)

For Category C, D, E, F, and G Projects only

Is effective mitigation feasible on this project?

Yes

If you answered **Yes** to the above question, the next question is required

Will mitigation be performed on any sites in this project?

Yes

If you answered **Yes** to the above question, the next question is required

Do you wish to attach a Hazard Mitigation Proposal?

Yes

If you answered **Yes** to the above question, the next two questions are required

Please provide the Scope of Work for the estimate:

To strengthen the south bridge pier San Joaquin County placed a pier support bracing structure adjacent to the pier. Given that the south bridge pier was undermined causing the bridge to fall by approximately 10 feet during the storm San Joaquin County placed an headwall on the channel side of the pier. To further protect the pier San Joaquin County constructed a concrete structure adjacent to the roadway side of the pier. Sketch Attachment: Bollea Gravity Wall Dwgs.pdf.

Would you like to add the Hazard Mitigation Proposal as a cost line item to the project cost?

No

Hazard Mitigation Proposal - 0909

#	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Type	Cost Estimate
*** Version 0 ***								
1	0909	Mitigation	1	LS	\$ 112,032.00	CONSTRUCTION		\$ 112,032.00
								Total Cost: \$ 112,032.00

Comments

The following mitigation measures to be cost-effective if the measures do not exceed 100 percent of the eligible repair cost (prior to any insurance reductions). The mitigation measures must meet the eligibility requirements described in Chapter 2.VII.C: Hazard Mitigation. There may be instances where these measures are required by codes or standards. For the purpose of erosion control, properly designed entrance and exit structures, such as a headwall, wingwalls, flared aprons, or energy dissipation measures to increase efficiency and help to minimize scour and erosion. Depending on the severity of erosion, solutions for bank protection may include gabion baskets, rip rap, cast-in-place concrete, crushed stone or rock, grouted rip rap, sheet-piling, geotextile fabric, or similar measures to control erosion. Alternatively, the use of vegetation or a combination of vegetation and construction materials such as live fascines, vegetated geogrids, live cribwalls, brushmattress walls, or similar measures are eligible. The Applicant should consider using green infrastructure techniques such as bioswales, bioretention, rain gardens and similar techniques that may be used in public drainage systems. The value of the damages: HMP Cost/Damage Cost = \$112,032/\$239,204 = 46.8%.

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name
RICHARD BYFIELD	09-30-2017	Drawings/Sketches	Bollea gravity wall dwgs	Bollea gravity wall dwgs.pdf	Bollea gravity wall dwgs.pdf(368.73 kb)

Cost Estimate

Is this Project Worksheet for

(Preferred) Repair								
Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Type	Cost Estimate
*** Version 0 ***								
Work Completed								
1	9007	Labor	1	LS	\$ 69,138.16	PERSONNEL	Work Completed	\$ 69,138.16
2	9008	Equipment	1	LS	\$ 2,693.83	EQUIPMENT	Work Completed	\$ 2,693.83
3	9003	Contract Costs	1	LS	\$ 239,203.80	CONTRACTUAL	Work Completed	\$ 239,203.80
Direct Grantee Admin Cost								
4	9901	Direct Administrative Costs (Subgrantee)	1	LS	\$ 981.45	INDIRECT CHARGES	Direct Grantee Admin Cost	\$ 981.45
								Total Cost : \$ 312,017.2

Insurance Adjustments (Deductibles, Proceeds and Settlements) - 5900/5901

Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Type	Cost Estimate
								Total Cost : \$ 0.0

Hazard Mitigation Proposal - 0909

Sequence	Code	Material and/or Description	Unit Quantity	Unit of Measure	Unit Price	Subgrant Budget Class	Type	Cost Estimate
*** Version 0 ***								
1	0909	Mitigation	1	LS	\$ 112,032.00	CONSTRUCTION		\$ 112,032.00
								Total Cost : \$ 112,032.0

Total Cost Estimate:

(Preferred Estimate Type + Insurance Adjustments)

\$ 312,017.24

Comments

At the time of the project formulation using the engineering estimates by MGE Engineering, Inc., prepared to use by San Joaquin County's Department of Public Works for Job Order Contracting to perform the work. The first estimate is titled, "On-Site Detour Estimate." The second estimate is titled, "Gravity Wall." The estimated changes total: \$239,204. These costs establish the estimate cost and the FEMA Cost Estimating Format (CEF) is used to validate the projected project costs for the work presented in the Damage Description and the Scope of Work. NOTE: these estimates became the basis to arrive at a negotiated not to exceed Job Order Costs. Therefore, the attachments, 1) On-Site Detour Estimate.pdf and 2) Gravity Wall Estimate.pdf with marked modifications are presented to show the estimated project cost information.

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name
RICHARD BYFIELD	10-04-2017	Contract Document	Phase 3 Contract \$162K Abut repair documents	Phase 3 Contract \$162K Abut repair documents	Phase 3 Contract \$162K Abut repair documents.pdf (958.21 kb)
RICHARD BYFIELD	10-04-2017	Contract Document	PO 47112 \$14K for MGE Applicant Consultant Engineer	PO 47112 \$14K for MGE Applicant Consultant Engineer	PO 47112 \$14K for MGE Applicant Consultant Engineer.PDF(8.90 kb)
RICHARD	10-05-	Additional			

BYFIELD	2017	Information	SJC_DAC_SJCOC80	SJC_DAC_SJCOC80	SJC_DAC_SJCOC80.xlsx(14.24 kb)
RICHARD BYFIELD	10-05-2017	Additional Information	PW ref SJCOC80 10 5 17	PW ref SJCOC80 10 5 17	PW ref SJCOC80 10 5 17.xlsm(4.44 Mb)
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Force Account Summary	PW ref SJCOC80 Force Account Summary	PW ref SJCOC80 Force Account Summary.pdf(12. kb)
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Payroll Data	PW ref SJCOC80 Payroll Data	PW ref SJCOC80 Payroll Data.pdf(39.95 kb)
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Labor	PW ref SJCOC80 Labor	PW ref SJCOC80 Labor.pdf(408.97 kb)
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Equipment Inventory	PW ref SJCOC80 Equipment Inventory	PW ref SJCOC80 Equipment Inventory.pdf(15.56 k
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Equipment	PW ref SJCOC80 Equipment	PW ref SJCOC80 Equipment.pdf(156.73 kb)
RICHARD BYFIELD	10-06-2017	Additional Information	PW ref SJCOC80 Contracts	PW ref SJCOC80 Contracts	PW ref SJCOC80 Contracts.pdf(14.89 kb)
RICHARD BYFIELD	10-11-2017	Additional Information	JOC Contracts - Advertise	JOC Contracts - Advertise	JOC Contracts - Advertise.pdf(208.79 kb)
RICHARD BYFIELD	10-11-2017	Additional Information	JOC Contracts - Award	JOC Contracts - Award	JOC Contracts - Award.pdf(1.14 Mb)
RICHARD BYFIELD	10-11-2017	Additional Information	SJCDPW-RFP-15-01 Justification	SJCDPW-RFP-15-01 Justification	SJCDPW-RFP-15-01 Justification.pdf(291.10 kb)
RICHARD BYFIELD	10-11-2017	Calculation Sheet	FINAL CEF Estimate SJCOC80 Bolleo Road Bridge 10.11.17	FINAL CEF Estimate SJCOC80 Bolleo Road Bridge 10.11.17	FINAL CEF Estimate SJCOC80 Bolleo Road Bridge 10.11.17.xlsm(414.67 kb)
RICHARD BYFIELD	10-11-2017	Calculation Sheet	Mitigation Calculation FINAL CEF ESTIMATE	Mitigation Calculation FINAL CEF ESTIMATE	Mitigation Calculation FINAL CEF ESTIMATE.xlsx(12.16 kb)
RICHARD BYFIELD	10-25-2017	Calculation Sheet	Calculation Worksheet for Bollea Road Bridge used to determine the SOW Qty	Calculation Worksheet for Bollea Road Bridge used to determine the SOW Qty	Calculation Worksheet for Bollea Road Bridge used to determine the SOW Qty .xlsx(16.73 kb)
RICHARD BYFIELD	10-26-2017	Additional Information	On-Site Detour Estimate	On-Site Detour Estimate	On-Site Detour Estimate.pdf(19.52 kb)
RICHARD BYFIELD	10-26-2017	Additional Information	Gravity Wall Estimate	Gravity Wall Estimate	Gravity Wall Estimate.pdf(48.78 kb)
RICHARD BYFIELD	10-26-2017	Appeal Document	Recalculation of Estimated Bollea Road Project Cost	Recalculation of Estimated Bollea Road Project Cost	Recalculation of Estimated Bollea Road Project Cost.xlsx(15.16 kb)

Existing Insurance Information

Insurance Type	Policy No.	Bldg/Property Amount	Content Amount	Insurance Amount	Deductible Amount	Yes Req
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Comments

Attachments

User	Date	Document Type	Description	Hard Copy File Reference	File Name
RICHARD BYFIELD	10-11-2017	Insurance Document	SJC Excess Insurance Property Coverage Documents FY 17-18	SJC Excess Insurance Property Coverage Documents FY 17-18	SJC Excess Insurance Property Coverage Documents FY 17-18.pdf(469.82 kb)

Comments and Attachments

Name of Section	Comment	Attachment
Project Description	Improvements were done at the south approach and the south bridge's pier footing which includes an HMP.	LOCATION MAP SJCOC80.pdf (10-04-2017) Sketch for Low Water Crossing 3-3-17.pdf (10-04-2017) Sketch for Bollea gravity wall.pdf (10-04-2017) SOW \$14K Consultant for Engineering Work I MGE.pdf (10-04-2017) Capture Bollea Bridge Information 1.JPG (10-04-2017) Capture Bollea Bridge Information 2.JPG (10-04-2017) SJC Trades Labor Institutional Bargaining (10-05-2017) Signed Emergency Notification-Bollea Rd Bridge (10-11-2017) Additional Photos.pdf (10-11-2017) Vic Map.pdf (10-11-2017) 1 PHOTOS for SJCOC80.pdf (10-25-2017) SOW for Bollea Road Bridge Access Low-Crc (10-25-2017) Bollea Road Functional Classification System 26-2017) FIRM.docx (10-03-2017)
Damage Facilities		
Special Considerations		

The following mitigation measures to be cost-effective if the measures do not exceed 100 percent of the eligible repair cost (prior to any insurance reductions). The mitigation measures must meet all eligibility requirements described in Chapter 2.VII.C: Hazard Mitigation. There may be instances where these measures are required by codes or standards. For the purpose of erosion control, add properly designed entrance and exit structures, such as a

Mitigation	headwall, wingwalls, flared aprons, or energy dissipation measures to increase efficiency and help to minimize scour and erosion. Depending on the severity of erosion, solutions for bank protection may include gabion baskets, rip rap, cast-in-place concrete, crushed stone or rock, grouted rip rap, sheet-piling, geotextile fabric, or similar measures to control erosion. Alternatively, the use of vegetation or a combination of vegetation and construction materials such as live fascines, vegetated geogrids, live cribwalls, brushmattresses, root wads, or similar measures are eligible. The Applicant should consider using green infrastructure techniques such as bioswales, bioretention, rain gardens and similar techniques that may be used in public drainage systems. The value of the damages: HMP Cost/Damage Cost = \$112,032/\$239204 = 46.8%.	Bollea gravity wall dwgs.pdf (09-30-2017) Phase 3 Contract \$162K Abut repair documen (10-04-2017) PO 47112 \$14K for MGE Applicant Consultar Engineer.PDF (10-04-2017) SJC_DAC_SJCOC80.xlsx (10-05-2017) PW ref SJCOC80 10 5 17.xlsm (10-05-2017) PW ref SJCOC80 Force Account Summary.p 2017) PW ref SJCOC80 Payroll Data.pdf (10-06-2017) PW ref SJCOC80 Labor.pdf (10-06-2017) PW ref SJCOC80 Equipment Inventory.pdf (10-06-2017) PW ref SJCOC80 Equipment.pdf (10-06-2017) PW ref SJCOC80 Contracts.pdf (10-06-2017) JOC Contracts - Advertise.pdf (10-11-2017) JOC Contracts - Award.pdf (10-11-2017) SJCDPW-RFP-15-01 Justification.pdf (10-11-2017) FINAL CEF Estimate SJCOC80 Bolleo Road 10.11.17.xlsm (10-11-2017) Mitigation Calculation FINAL CEF ESTIMATE 11-2017) Calculation Worksheet for Bollea Road Bridge determine the SOW Qty.xlsx (10-25-2017) On-Site Detour Estimate.pdf (10-26-2017) Gravity Wall Estimate.pdf (10-26-2017) Recalculation of Estimated Bollea Road Proj Cost.xlsx (10-26-2017) SJC Excess Insurance Property Coverage Dc FY 17-18.pdf (10-11-2017)
	At the time of the project formulation using the engineering estimates by MGE Engineering, Inc., prepared to use by San Joaquin County's Department of Public Works for Job Order Contracts to perform the work. The first estimate is titled, "On-Site Detour Estimate." The second estimate is titled, "Gravity Wall." The estimated changes total: \$239,204. These costs establish the estimated project cost and the FEMA Cost Estimating Format (CEF) is used to validate the projected project costs for the work presented in the Damage Description and the Scope of Work. NOTE: these estimates became the basis to arrive at a negotiated not to exceed Job Order Costs. Therefore, the attachments, 1) On-Site Detour Estimate.pdf and 2) Gravity Wall Estimate.pdf with marked modifications in red are presented to show the estimated project cost information.	
Cost Estimate		
Insurance Information		

Bundle Reference # (Amendment #)	Date Awarded

Subgrant Application - FEMA Form 90-91

FEDERAL EMERGENCY MANAGEMENT AGENCY PROJECT WORKSHEET									
DISASTER					PROJECT NO.	PA ID NO.	DATE	CATEGORY	
FEMA	4308	-	DR	-CA	SJCOC80	077-99077-00		C	
APPLICANT: SAN JOAQUIN (COUNTY)							WORK COMPLETE AS OF: 09-30-2017 : 99 %		
							Site 1 of 1		
DAMAGED FACILITY:							COUNTY: San Joaquin		
Bollea Road Bridge									
LOCATION:							LATITUDE:	LONGITUDE:	
Current Version: Bollea Road Bridge, Number 29C04213 Wallace, California GPS: 38.193388, -120.982683							38.193388	-120.98268	
DAMAGE DESCRIPTION AND DIMENSIONS:									
Current Version: Severe storms occurred in the County of San Joaquin producing heavy rains that saturated the ground. The torrential rains were accompanied by high winds which resulted in damage to the county's improved property such as the Bollea Road Bridge, Number 29C04213. The Applicant owns the facility and has the legal responsibility for maintaining and repairing any damages. The Bollea Road is classified as a "Local Road (7)" in the State's Functional Classification System. The report presented through site photos shows that from high waters within Bear Creek the south pier of the bridge was undermined causing the bridge to sink approximately 10 IN. This made the bridge impassable. The Bollea steel bridge at Bear Creek measures: 56.4 FT in length with the span length between the two piers measuring: 53.8 FT. The bridge width measures: 19.4 FT. The bridge was constructed in 1997. Emergency work, addressed within the Category B work removed the damaged bridge consisted of the southern buttress sinking 10 IN at the southeast corner. The headwall buttress pier supporting the south end of the bridge measures roughly 20 FT in roadway width X approximately 4 FT in roadway length and Height.									
Program Delivery Manager (PDMG) was unable to verify and quantify the extent of the damages. However, the work in the field meshes with the work proposed within the supporting documents provided. Therefore the damage description dimensions were estimated based on the visible repairs done and planned to be done. See the photos and sketch for details and location address with GPS.									
The GPS coordinates (38.193388, -120.982683) was taken at the southeast Bollea Road bridge deck.									
The project address items number 6, 7, and 8 from the applicants LOP.									

SCOPE OF WORK:

Current Version:
WORK COMPLETED

BOLLEA ROAD BRIDGE

The Bollea Road Bridge, Number 29C0413, south pier was inundated with high storm water that caused the pier to be undermined and settle approximately 10 IN below the approaching roadway. To return the Bollea Road Bridge to service Joaquin County prepared three phases of work. Phase I) construct a bypass roadway to permit access to property traveled by residents during repairs and construction as this road is the only vehicle access. Phase II) Add a headwall to the Creek side of the south pier to buttress the pier from future creek water flows. And Phase III) construct a southern buttress to the south pier, the roadway bridge approach, to strengthen the pier and aid in maintaining pier stability.

Repairs:

Phase I) Construction of the bypass roadway for access during construction work:

- 1) Road clearing: that measures 285 FT in length X 16 FT in width X an average of 1 FT in depth = 4,560 CF of soil /27 CF/CY = 169 CY X 1.3 Ton/CY = 220 TON.
- 2) The placement of culverts at the Bear Creek was three (3) 48 IN Diameter CMC and one (1) 36 IN Diameter CMC and each measured 40 FT in length. Therefore Three (3) 48 IN diameter culverts at 40 FT in length = 120 FT. And Or diameter culvert at 40 FT in length = 40 FT.
- 3) The roadway rock for the road base measures 285 FT in length X 15 FT in roadway width X 8 IN in roadway depth = 2,822 CF /27 CF/CY = 105 CY X 1.3 TON/CY = 137 TON.
- 4) The rock base material at the culverts measures 40 FT in roadway length X 25 FT in roadway culvert width x 5 FT in depth = 5,000 SF /27 CF/CY = 186 CY less the culvert area that measures for the 3 – 48 IN culverts, pi X the radius 3.1416 = 6.283 X 40 FT in length of culvert plus 1 – 36 IN culvert, pi X the radius, 1.5 FT X 3.1416 = 4.7124 CF X 40 FT in length of culvert subtracts 943 CF. Therefore the aggregate placed is 186 CY – 35 CY = 151 CY X 1.3 TON/CY =
- 5) The roadway soil surface material measures 215 FT in roadway length X 15 FT in roadway width X 1 FT in depth = 4,275 CF /27 CF/CY = 159 CY X 1.7 TON/CY = 271 TON.
- 6) The roadway aggregate placed measures 285 FT in length X 15 FT in roadway width X 4 IN in depth = 1,411 CF /27 CF/CY = 53 CY X 1.3 TON/CY = 69 TON.

Phase II) Pier repairs, Bear Creek side of the pier – new headwall to bolster support of the pier against future water flow.

- 1) The new headwall measures at the face of the pier 20 FT in roadway pier width by 18 IN in headwall thickness X 4 FT in Height = 120 CF /27 CF/CY = 5 CY X 2 TON/CY = 10 TON.
- 2) There are two added wing walls that measure two (2) x the 4 FT extended headwall length X 18 IN in headwall thickness X 4 FT in headwall height = 48 CF /27 CF/CY = 2 CY X 2 TON/CY = 4 TON. Total: 5 CY + 2 CY = 7 CY X 2 TON concrete.
- 3) Reinforcing bar for the new headwall is calculated based on 4 lineal feet of rebar per square foot of headwall constructed. This measures 28 FT in length X 4 FT in height = 112 SF X 4 LF/SF = 448 LF of rebar.
- 4) Connecting dowel rods to secure the headwall to the existing pier. The number of rods is 19 and each are 1 FT in length. These are number 5 rebar dowels. Total length is 19 X 1 FT = 19 LF.
- 5) Pins to connect the new headwall to the existing bridge pier = 19 pins placed 1 FT on center x 1.5 FT in length = 29 LF.
- 6) The surface area of the headwall was buttressed with rip-rap that measured approximately 8 IN in diameter for the entire surface area of the headwall: 28 FT in length X the 4 FT in height X 1.5 FT in depth = 168 CF of rip-rap /27 CF/1.3 TON/CY = 10 TON.
- 7) The roadway path cut into the hillside to bring materials to the headwall measures 30 FT in length X 7 FT in width X 1.5 FT in cut/fill = 315 CF /27 CF/CY = 12 CY X 1.3 TON/CY = 16 TON.

Phase III) OPTION A – In-Kind Repairs – Approach to Sunken Bridge Demolition:

- 1) Asphalt removal: 6 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 30 CF /27 CF/CY = 2 CY X 1.9 TON/CY = 4 TON.
- 2) Aggregate removal: 6 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 79 CF /27 CF/CY = 3 CY X 1.3 TON/CY = 4 TON.
- 3) Soil Removal: 6 FT in roadway length X 20 FT in roadway width X 3 FT in depth = 360 CF /27 CF/CY = 14 CY X 1.3 TON/CY = 19 TON.

New Construction:

- 1) Asphalt installation: 6 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 30 CF /27 CF/CY = 2 CY X 1.9 TON/CY = 4 TON.
- 2) Aggregate installation: 6 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 79 CF /27 CF/CY = 3 CY X 1.3 TON/CY = 4 TON.
- 3) Soil installation: 6 FT in roadway length X 20 FT in roadway width X 2 FT in depth = 240 CF /27 CF/CY = 9 CY X 1.3 TON/CY = 12 TON.
- 4) The guardrail posts place at 3 FT intervals on both sides of the 6 roadway = 6.
- 5) The guardrail measures two X 6 FT = 12 LF.
- 6) Roadway center line paint striping measures 6 LF.

Phase III) OPTION B – South Approach Retaining Wall - Actual Repairs by San Joaquin County

South approach retaining wall

Part 1) Excavation of removal of roadway and earth

- 1) Demolition of the existing roadway asphalt material: 19 FT in roadway length X 20 FT in roadway width X 0.25 FT in material depth = 95 CF /27 CF/CY = 4 CY X 1.9 TON/SF = 8 TON.
- 2) Demolition of the existing roadway base: 19 FT in roadway length X 20 FT in roadway width X 0.66 FT in material depth = 261 CF /27 CF/CY = 10 CY X 1.3 TON/CY = 13 TON.
- 3) Excavation of the earth to permit the retaining wall to be constructed: A) Pit, 19 FT in length X 20 FT in width X 11 FT in depth = 4,180 CF /27 CF/CY = 155 CY X 1.3 TON/CY = 201 TON; and B) Pit embankment, 19 FT in length X 5.1 X 11 FT in depth = 1,150 CF /27 CF/CY = 43 CY X 1/3 TON/CY = 56 TON; Total is 155 CY + 43 CY = 198 CY X 1.3 TON/CY = 258 TON.

Part 2) Construction of the Retaining Wall

- 1) Concrete Slab – 15.33 FT in length X 20 FT in width X 2 FT in thickness = 614 CF /27 CF/CY = 23 CY X 2.0 TON/CY = 46 TON.
- 2) Concrete Wall – 8 FT in Height X 20 FT in width X 2 FT in thickness = 320 CF /27 CF/CY = 12 CY X 2.0 TON/CY = 24 TON.
- 3) Concrete Bracing Walls: Part A) 13.33 FT in length X 1 FT in width = 14 CF /27 CF/CY = 1 CY; and 1 FT in length X 7 FT in width X 1 FT in thickness = 7 CF /27 CF/CY = 1 CY; and 7 FT in length X 12.33 FT X 1 FT it This totals: 1 CY + 1 CY + 4 CY = 6 CY X 2.0 TON/CY = 12 TON.
- 4) Therefore, the Total Concrete work = Slab, 23 CY, plus Wall, 12 CY, plus Bracing walls, 1 CY + 1 CY + 4 CY = 41 CY X 2.0 TON/CY = 82 TON.
- 5) Reinforcing bar for the new retaining wall is calculated based on 4 lineal feet of rebar per square foot of headwall constructed. This measures per the engineered drawings 617 SF X 4 LF/SF = 2,592 LF of rebar.
- 6) Reinforcing bar connectors from the retaining wall to the building pier are anchored 24 IN vertically and 12 IN horizontally. This represents a grid county of 90 connectors at 1.5 FT per connector = 1,350 LF of reinforcing bar.

Part 3) Infill Roadway

- 1) The soil fill measured first by the removal at 189 CY less the volume of the concrete work at 41 CY. The net replacement of new soil is 189 CY - 41 CY = 157 CY X 1.3 TON/CY = 205 TON.
- 2) The aggregate placement is 19 FT in roadway length X 20 FT in roadway width X 0.66 FT in depth = 251 CF /27 CF/CY = 10 CY X 1.3 TON/CY = 13 TON.
- 3) The asphalt material measures 19 FT in roadway length X 20 FT in roadway width X 0.25 FT in depth = 95 CF /27 CF/CY = 4 CY X 1.9 TON/CY = 8 TON.
- 4) The guardrail posts place at 3 FT intervals on both sides of the 19 roadway = 14.
- 5) The guardrail measures two X 19 FT = 38 LF.
- 6) Roadway center line paint striping measures 19 LF.
- 7) Sod grass seed was placed along the bypass roadway for erosion and turbidity protection as the bypass roadway is saved to permit future bridge repair work: 285 FT in Length x 16 FT in roadway width plus 4 additional FT for both side stabilize the embankment = 24 FT in width X ½ IN in depth = 285 CF /27 CF/CY = 11 CY.

To contract for the work, the San Joaquin County Contractor retained a contractor using the County's Job Order Contract and retained an engineering firm already under an annual agreement. The Force Account Labor and Equipment will be used to direct the engineering preparation work and direct the Job Order Contract work. The Force Accounts are in-house engineering services to determine and direct the proposed engineering and direction of the work performed by consultants and job order contractor and equipment to travel to the project site.

Labor Hours – 9007: 675.49 Hours;

Equipment Hours – 9008: 134.5 Hours;

Contracts – 9003

Consultant Agreement: MGE Engineering: Emergency engineering services for Bollea Road Bridge.

PHASE I) Construction of the access roadway: On-Site Detour, San Joaquin County, Department of Public Works.

PHASE II) Pier repairs, Bear Creek side of the pier – new headwall to bolster support of the pier against future water flow, San Joaquin County, Department of Public Works.

PHASE III) South approach retaining wall, San Joaquin County, Department of Public Works.

PROJECT NOTES:

Calculations are rounded up to the nearest whole number.

Invoices: To date, the applicant has not provided an invoice. Only contracts with a not to exceed amount have been provided.

The FEMA Equipment worksheet was not functioning so the FEMA codes and unit costs were provided in the comments section of the equipment worksheet.

Conversion Factor for Concrete measurement: 2.0 TONS per cubic yard.

The JOC attachment were submitted to show how the Applicant procured and selected the Job Order Contractors with stated material unit pricing.

NOTES:

VALIDATION OF SUBGRANTEE COST ESTIMATES

The Subgrantee provided the estimate for this site and FEMA validated the estimate and found it to be reasonable for the work to be performed. The cost of work to be completed was estimated by using the San Joaquin County Department of Public Works material bid price and historical cost as well as RS Means

CEF - This large project was estimated using the Cost Estimating Format (CEF).

COST BASIS FOR LABOR, EQUIPMENT AND MATERIALS: Costs used to formulate this project were based on:

Unit Costs provided by Applicant

RS Means cost estimating guide

Local material cost

The FEMA PDGM used FEMA cost codes / RS MEANS to establish a fair & reasonable cost for this Bollea Road Bridge Repair project.

LARGE PROJECTS - This is a large project and final funding will be based on actual costs incurred by the applicant for completing eligible work specifically approved in the scope of work for this project. 44 CFR 206.203.1 states "Federal share of actual costs documented by the grantee."

75% FEDERAL FUNDING: In accordance with 44 CFR 206.47(a) and current disaster declaration determinations, this project worksheet will be funded with the Federal Cost share at 75% of all eligible costs.

By accepting this grant the Applicant to the best of their ability acknowledges that all damages described within this Sub-grant Application and all associated costs being claimed were a direct result of the declared event, and in connection with the incident period of 2-1-2017 to 2-23-2017.

The Applicant has been advised by FEMA PDGM and/or the Project Specialist that in the seeking of proposals and letting of contracts for eligible work, the applicant must comply with their local state and/or federal procurement laws, regulations, and procedures. Federal funding is contingent upon applicant acquiring all necessary federal, state and local permits. Non-compliance with this requirement may jeopardize the receipt of federal funds.

PROCUREMENT - As a condition of receiving FEMA financial assistance, the Applicant acknowledges that it must comply with the procurement standards and requirements set forth in 2 C.F.R. §§ 200.317-200.326 when soliciting and awarding contracts using FEMA financial assistance. The Applicant must manage and administer its FEMA grant funds in compliance with applicable Federal requirements.

PROFESSIONAL SERVICES- Additional costs for professional services relating to this scope of work may be considered for funding on a case-by-case basis.

Approval will be based on the merit of supporting documentation attached to the Subgrantee's request.

The legal authority upon which the need is based and cost reasonableness.

STATE PERMITS / CODES AND STANDARDS-

FEDERAL FUNDING IS CONTINGENT UPON THE APPLICANT ACQUIRING ALL NECESSARY FEDERAL, STATE AND LOCAL PERMITS. NON-COMPLIANCE WITH THIS REQUIREMENT AND FAILURE TO FOLLOW AND MEET THE APPLICABLE CODES AND STANDARDS, MAY JEOPARDIZE THE RECEIPT OF FEDERAL FUNDS. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO THE COMMENCEMENT OF WORK. COPIES OF PERMITS SHOULD BE RETAINED IN THE PROJECT FILES FOR CLOSEOUT RECONCILIATION.

AUDIT STATEMENT: All documentation related to this project worksheet is subject to audit and must reflect disaster – related work and project – specific cost. The applicant has been advised of responsibility to maintain supporting documentation (records). The type of records to be maintained is specified in FEMA policy 2 CFR Subpart F, Audit Requirements. Records must be maintained for three (3) years from the date the last project was completed or from the date final payment is received, whichever is later.

FEDERAL AID ROADS: Program Delivery Manager has validated that none of the sites in this project are listed on the Federal Functional Classification System as Major Collectors, Minor Arterials, Principal Arterials, or Interstate, receiving federal funding. Utilizing the website http://dot.ca.gov/hq/tsp/hseb/crs_maps/index.php

ROAD PROJECTS (FIRMette Requirement): Any road being repaired to pre-disaster design, function, capacity that does not include a hazard mitigation proposal, will not require a FIRMette. If any work to repair the road requires work outside the original footprint a FIRMette will be required.

RECORD RETENTION: As described in 2 CFR 200.33 Subgrantee must maintain all work-related records for a period of three (3) years from Subgrantee closure (final payment), all records relative to this project worksheet are subject to external audit by the State, FEMA and the Comptroller General of the United States and must reflect work related to disaster specific costs.

PROCUREMENT: The Applicant was advised by FEMA PDGM and/or Project Specialist that in the seeking of proposals and letting of contracts for eligible work, the Applicant must comply with its Local, State and/or Federal procurement regulations, and procedures as required by 2 CFR 317-326

PERMITS: Federal Funding is contingent upon acquiring all necessary Federal, State and Local permits. Noncompliance with this requirement may jeopardize the receipt of federal funds. The applicant is responsible for obtaining all required permits prior to the commencement of work. Copies of permits should be retained in the project files for closeout reconciliation.

ENVIRONMENTAL AND HISTORIC PRESERVATION: Applicant must comply with all applicable environmental and historic preservation laws. Federal funding is contingent upon acquiring all necessary Federal, State and Local permits. Noncompliance with this requirement may jeopardize the receipt of federal funds.

DIRECT ADMINISTRATIVE COSTS - The subgrantee is requesting direct administrative costs that are directly chargeable to this specific project. Associated eligible work is related to administration of the PA project only and in accordance with the project budget.

CFR 13.22. These costs are treated consistently and uniformly as direct costs in all federal awards and other subgrantee activities and are not included in any approved indirect cost rates.

INSURANCE - As a condition of receiving permanent work Public Assistance funding the subgrantee is required to obtain and maintain insurance that is reasonably available, adequate and necessary to protect against future loss from a s

INSURANCE REVIEW: The applicant is aware that all projects are subject to an insurance review as stated in 44 C.F.R. Sections 206.252 and 206.253.If applicable, an insurance determination will be made either as anticipated proceeds proceeds in accordance with the applicant's insurance policy which may affect the total amount of the project. Approval of this project may result in an obtain/maintain insurance requirement. The Subgrantee must comply with insurance re and conditions upon receipt of sub-grant from the State.

ACTUAL COSTS - FEMA and State staff have reviewed the documentation and costs provided by the applicant in support of this project and based on that review, the costs appear to meet the minimum eligibility standards.

INELIGIBLE - The applicant may appeal this determination through the Grantee's Office within 60 days of notification of this determination as stated in Title 44 CFR 206.206. The appeal must include supporting documentation and referer appropriate regulations.

ATTACHMENTS

LOCATION MAP SJCOC80.pdf

Sketch for Low Water Crossing 3-3-17.pdf

Sketch for Bollea gravity wall.pdf

SOW \$14K Consultant for Engineering Work by MGE.pdf

Capture Bollea Bridge Information 1.JPG

Capture Bollea Bridge Information 2.JPG

SJC_Trades_Labor_Institutional_Bargaining_Unit.pdf

Signed Emergency Notification-Bollea Rd Bridge.pdf

Additional Photos.pdf

Vic Map.pdf

1 PHOTOS for SJCOC80.pdf

SOW for Bollea Road Bridge Access Low-Crossing.docx

Bollea Road Functional Classification System.docx

FIRM.docx

Bollea gravity wall dwgs.pdf

Phase 3 Contract \$162K Abut repair documents.pdf

PO 47112 \$14K for MGE Applicant Consultant Engineer.PDF

SJC_DAC_SJCOC80.xlsx

PW ref SJCOC80 10 5 17.xlsm

PW ref SJCOC80 Force Account Summary.pdf

PW ref SJCOC80 Payroll Data.pdf

PW ref SJCOC80 Labor.pdf

PW ref SJCOC80 Equipment Inventory.pdf

PW ref SJCOC80 Equipment.pdf

PW ref SJCOC80 Contracts.pdf

JOC Contracts - Advertise.pdf

JOC Contracts - Award.pdf

SJCDPW-RFP-15-01 Justification.pdf

FINAL CEF Estimate SJCOC80 Bolleo Road Bridge 10.11.17.xlsm

Mitigation Calculation FINAL CEF ESTIMATE.xlsx

Calculation Worksheet for Bollea Road Bridge used to determine the SOW Qty .xlsx

On-Site Detour Estimate.pdf

Gravity Wall Estimate.pdf

Recalculation of Estimated Bollea Road Project Cost.xlsx

SJC Excess Insurance Property Coverage Documents FY 17-18.pdf

Does the Scope of Work change the pre-disaster conditions at the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Special Considerations included? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Hazard Mitigation proposal included? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is there insurance coverage on this facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

PROJECT COST					
ITEM	CODE	NARRATIVE	QUANTITY/UNIT	UNIT PRICE	COST
		*** Version 0 ***			
		Work Completed			
1	9007	Labor	1/LS	\$ 69,138.16	\$
2	9008	Equipment	1/LS	\$ 2,693.83	
3	9003	Contract Costs	1/LS	\$ 239,203.80	\$
		Direct Grantee Admin Cost			
4	9901	Direct Administrative Costs (Subgrantee)	1/LS	\$ 981.45	
				TOTAL COST	\$
PREPARED BY RICHARD BYFIELD			TITLE Program Delivery Manager	SIGNATURE	
APPLICANT REP. Michael R Cockrell			TITLE Director of Emergency Operations	SIGNATURE	

SAN JOAQUIN (COUNTY) :					
Conditions Information					

Review Name		Condition Type		Condition Name		Description		Monitored		§	
No Conditions											
Internal Comments											
No.	Queue		User	Date/Time			Reviewer Comments				
No Comments											

APPENDIX D

CULTURAL RESOURCES REPORTS (CONFIDENTIAL)

Due to the Confidential Nature of Historic Resources, the Historic Resources Reports are not provided in public documentation but have been provided to the appropriate resource agencies for review.

APPENDIX E

WATER QUALITY TECHNICAL MEMORANDUM

Bollea Bridge Replacement Project



Water Quality Technical Memorandum

Bridge No. 29C-0413
Wallace, San Joaquin County, CA
Caltrans District 10
BRLO-5929 (236)
“Wallace, CA” 7.5-Minute Topographic Quadrangle, T4N R9E Section 16, Mt. Diablo
Baseline Meridian

October 2018



Water Quality Technical Memorandum

Bollea Bridge Replacement Project
Bridge No. 29C-0413
Bollea Road
San Joaquin County
Caltrans District 10
BRLO-5929 (236)

October 2018

STATE OF CALIFORNIA
Department of Transportation
County of San Joaquin

Prepared By:



Date:

10/09/2018

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For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, ATTN: Senior Environmental Planner, Office of NEPA Assignment and Env. Compliance, Division of Local Assistance, 1976 East Dr. Martin Luther King Jr. Blvd., Stockton, CA 95205 (559) 445-6310 (Voice), or use the California Relay Service TTY number, 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

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APPENDICES

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LIST OF ABBREVIATED TERMS

AASHTO	American Association of State Highway Transportation Officials
ADT	Average daily traffic
AES	Analytical Environmental Services
Amsl	Above mean sea level
ASBS	Areas of Special Biological Significance
BMP	Best management practice
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGP	Construction General Permit
County	San Joaquin County
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
DHA	Drake Haglan and Associates
DSA	Disturbed Soil Area
EPA	U.S. Environmental Protection Agency
Guidelines	U.S. Environmental Protection Agency's Section 404 (b)(1) Guidelines
HBP	Highway Bridge Program
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
Memorandum	<i>Water Quality Technical Memorandum</i>
Mph	Miles per hour
MS4	Municipal Separate Storm Sewer System
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
Proposed Project	Bollea Bridge Replacement Project
Report	Draft Structure Type Selection Report
ROW	Right-of-way
RUSLE	Revised Universal Soil Loss Equation
RWQCB	Regional water quality control board
SER	<i>Standard Environmental Reference</i>
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDL	Total maximum daily load
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

WDR	Waste discharge requirement
WPCP	Water Pollution Control Plan
°F	Degrees Fahrenheit

1.0 INTRODUCTION

Bollea Road is a rural local County road with an Average Daily Traffic (ADT) volume of approximately 26 vehicles per day that serves less than ten residential parcels and ends approximately 1,500 feet south of the project site. The project site is located approximately 1,500 feet south of Highway 12 at the San Joaquin/Calaveras County line near the community of Wallace. The Bollea Road Bridge (No. 29C-413) is comprised of two railcars welded together to create a 56-foot long by 19-foot wide (clear width) bridge intended to be a temporary replacement of a timber bridge that washed out in 1998. In 1998, the replacement was only partial, leaving portions of wing walls and foundation walls in situ, while spread footings for the railcars were installed and cast in place. Caltrans determined that the bridge was structurally deficient as early as 2008, and creek flows during the winter of 2016/2017 exposed remnant foundation structures which split the flow of the creek, undermining bridge supports with resultant partial collapse of the structure.

In order to maintain traffic and access to the residential parcels during construction, two detour alternatives were being examined, however exigent circumstances required the construction of one of the alternatives prior to the completion of environmental studies. The Bollea Road Bridge provided the only ingress and egress for approximately six residences west of the bridge; in order to supply essentials (e.g. propane, groceries, and emergency access), the County was forced to construct an emergency bypass road approximately 15 feet east of the extant bridge, placing culverts to convey Bear Creek past the failed bridge. This activity was located within the Area of Potential Effects (APE) already defined for the Proposed Project (**Appendix A**).

It is proposed to replace the existing 56-foot long by 19-foot wide (clear width) rail car bridge with a 67-foot long by 20-foot wide (clear width), single-span, post-tensioned concrete slab bridge supported on seat-type abutments and 24-inch cast-in-drilled-hole (CIDH) concrete piles. The railings proposed for the bridge will be the Caltrans standard Type 80 barrier rail. This Technical Memorandum has been prepared to discuss information regarding potential impacts to water quality as a result of the Bollea Road Bridge replacement (Proposed Project).

In order to maintain traffic and access to the residential parcels during construction an onsite detour is required. As a result of heavy storms flows during the winter of 2017, the south abutment of the existing bridge was undermined causing the County to close the bridge. In order to provide access to the residents south of the bridge, the County installed an emergency detour consisting of four corrugated metal pipes. It is the County's intent to leave the detour in place through construction of the new bridge.

1.1 PURPOSE AND NEED

The primary objective of the Proposed Project is to replace the existing bridge with a structure that is consistent with current standards. The roadway approaching to the bridge from the north and south are tangent alignments, with the bridge tangent to the south approach. This alignment creates an angle point where the north end of the bridge meets the north approach. The elevation of the existing bridge is higher than either approach resulting in a rise or "hump" in the roadway. This difference in grade, along

with the angle point in the alignment at the north approach causes a site distance issue for vehicles approaching the bridge. It is proposed to replace the existing 56-foot long by 19-foot wide (clear width) rail car bridge with a 67-foot long by 20-foot wide (clear width), single-span, post tensioned concrete slab bridge, supported on seat type abutments and 24-inch cast-in-drilled-hole (CIDH) concrete piles. The profile grade for the new bridge will need to be raised approximately 0.55 feet to pass the 100-year storm event in conformance with the Caltrans Design Manual. The railings proposed for the bridge will be the Caltrans standard Type 80 barrier rail.

1.2 PROJECT LOCATION

The project site is located in Township 4 North, Range 9 East, Section 16, as depicted on the U.S. Geological Survey (USGS) "Wallace, CA" 7.5-minute topographic quadrangle. The project site includes the Bollea Road Bridge (No. 29C-413) over Bear Creek in eastern San Joaquin County, west of the community of Wallace; the project site extends far enough eastward to enter Calaveras County and encompasses a total of 4.37 acres. The study area is rural; surrounding land uses include rural residential uses, agriculture, and undeveloped open space (**Figures 1 and 2**). The total area of the project site is 4.37 acres.

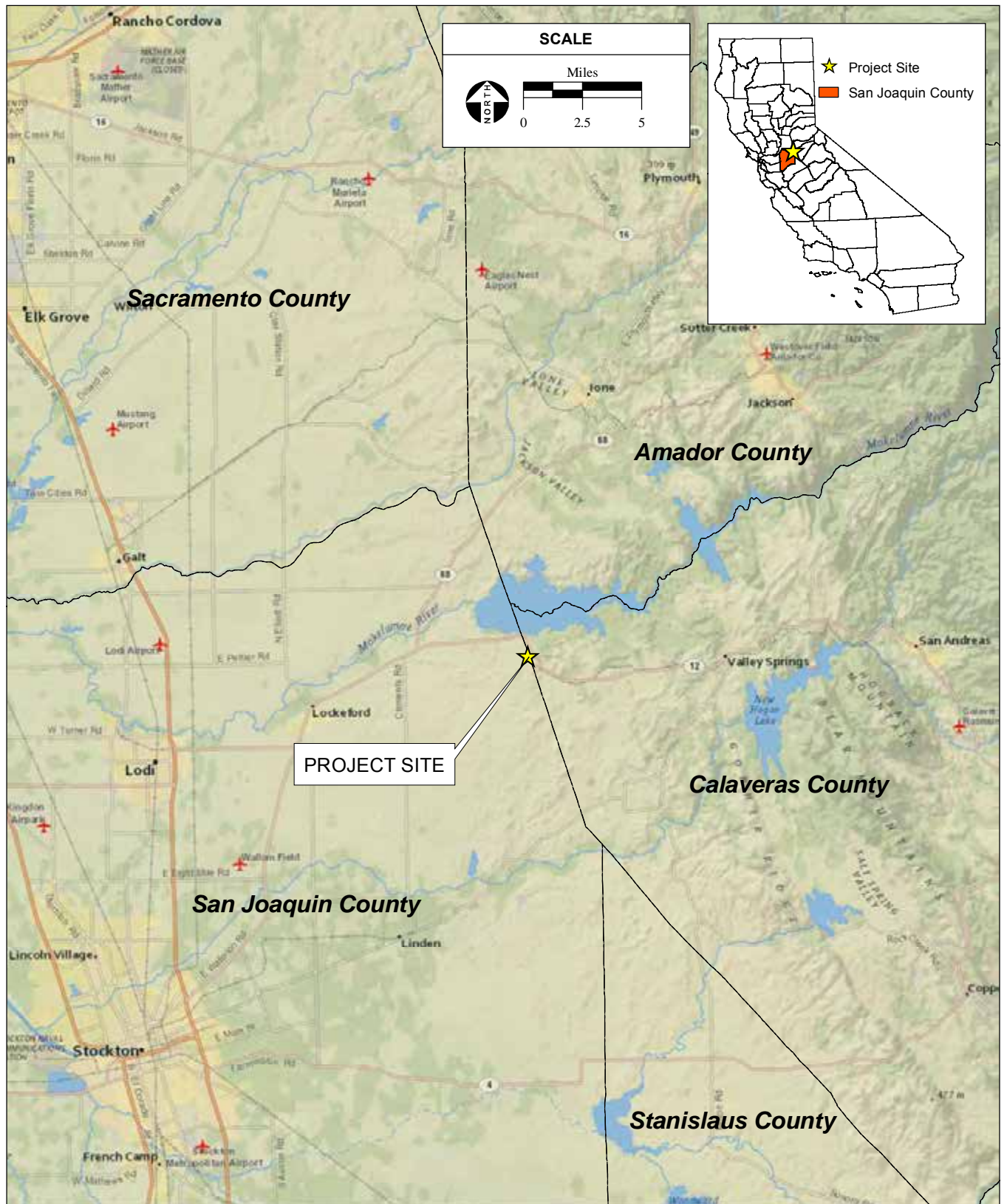
1.3 PROJECT CHARACTERISTICS

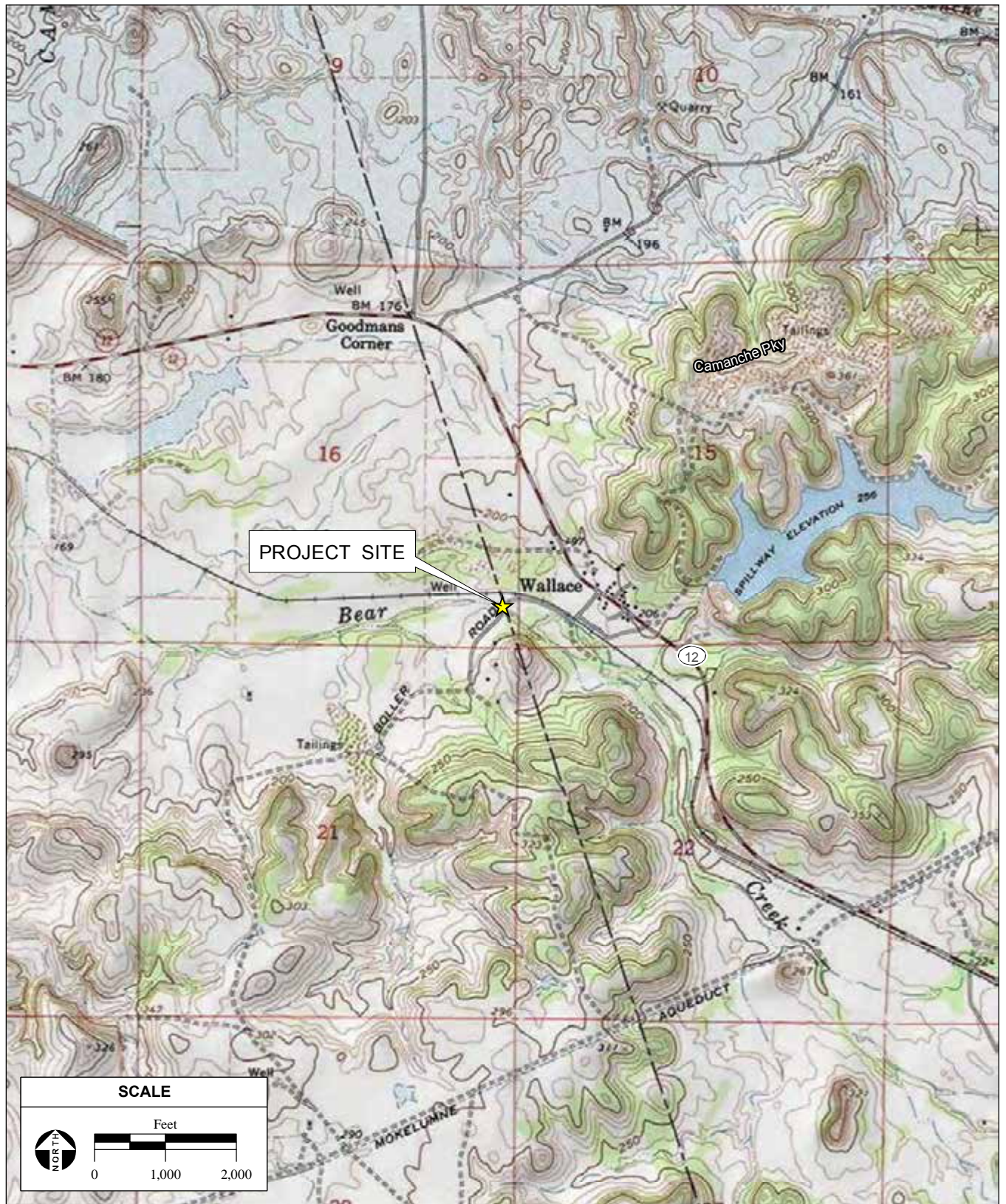
The Proposed Project generally includes the following elements, as described in more detail below:

- Removal of the existing bridge across Bear Creek; and
- Construction of a new bridge to meet current standards.

The Proposed Action, identified by Federal Project Number BRLO-5929 (236), involves replacement of the Bollea Road Bridge (No. 29C-413) and removal of an emergency bypass crossing. San Joaquin County, in coordination Calaveras County and Caltrans District 10, is proposing to replace the existing bridge with a bridge that meets current AASHTO standard width requirements for a two-lane facility in conformance with the guidelines presented in the Design of Very Low Volume Local Roads.

Bollea Road has a prima facie 55 mile per hour speed limit, except in the vicinity of the bridge where the curves are posted for 25 miles per hour. To improve drivability and the sight distance, the new bridge alignment will be curved with a 4 percent super-elevation. The selected alignment has a 375-foot radius (40 mile per hour design speed), with the profiles on the approaches raised to eliminate the low spots near the north and south abutments. The south approach for a 40 mph design speed is designed with a 100-foot crest vertical curve with a K factor of 20.26. The north approach 100-foot crest vertical curve (K factor 52.49) will work with a design speed of 50 mph. This configuration was chosen based on the expectation that vehicles coming from the north may be travelling faster than 40 mph (based on field observations). In addition to the vertical curve requirements, the length of the approach roadway to be reconstructed was governed by the length needed to develop the runoff/runoff for the 4% superelevation of the horizontal curve.





SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 7/25/2018

Bollea Road Replacement Project Water Quality Technical Memorandum / 215572 ■

Figure 2
Project Vicinity

The 375-foot alignment shifts the alignment approximately 4 feet to the east, with the west edge of the new bridge closely matching the west edge of the existing bridge. This alignment results in 153 feet of approach roadway work for the south approach and 255 feet of approach roadway work for the north approach. This alignment would not encroach on the drainage channel located adjacent to the west side of the north approach and would require the least amount of right-of-way acquisition. In fill sections, the embankment side slopes will be 3H:1V, except behind the guard rail where it will be 2H:1V. This is in conformance with current San Joaquin County policies.

Each of the proposed roadway alignments will require additional permanent right-of-way to be acquired adjacent to the east side of Bollea Road in both San Joaquin and Calaveras counties to provide for the roadway fill slopes. Construction activities could include installation of cast-in-drilled-hole piles, structure demolition, excavation, and construction, roadway excavation and construction, and stream channel work. A Draft Structure Type Selection Report (Report) was prepared for the Proposed Project (MGE, 2017). Three potential foundations were evaluated: Cast-in-Drilled Hole piles, Spread Footings, and Driven Piles. Due to the potential for future scour, spread footings were not considered feasible. Driven piles (displacement, concrete, open-end steel, or H-piles) are not considered feasible at this site due to likely hard driving conditions and the inability to achieve the adequate embedment to provide structural support. Instead, Caltrans Standard 24-inch Cast-in-Drilled Hole piles will be used as bridge foundation.

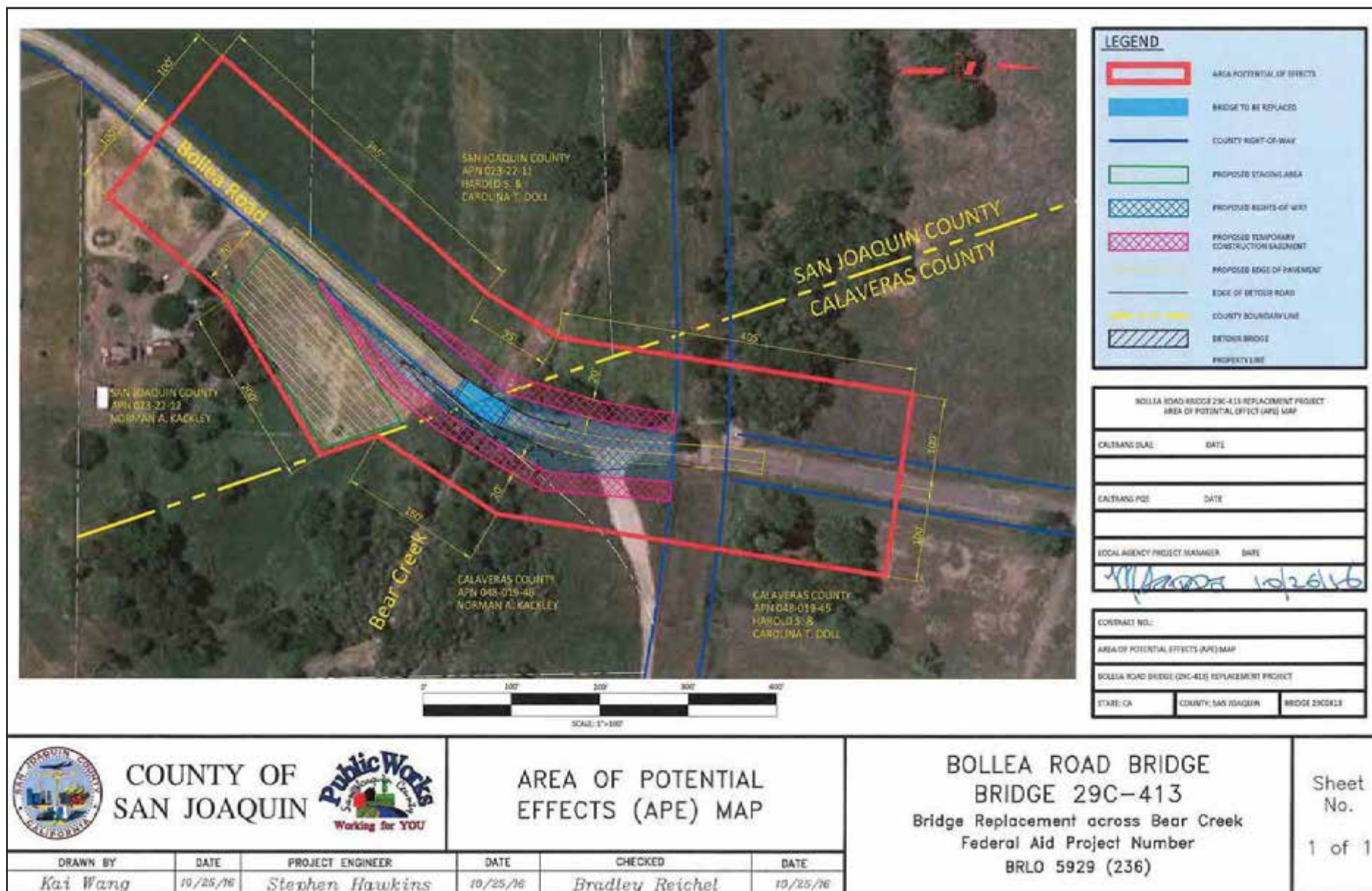
1.3.1 RIGHT-OF-WAY

The project site is predominantly rural and is located in Township 4 North, Range 9 East, Section 16, as depicted on the USGS "Wallace, CA" 7.5-minute topographic quadrangle. Surrounding land ownership includes privately held parcels (Assessor's Parcel Number (APN): 02322011 and 02322012 in San Joaquin County, 48018145 and 48019045 in Calaveras County) as well as County-owned right-of-way (ROW). The existing bridge is entirely within the ROW, but ROW acquisitions would be necessary to construct the approaching roadway on either side. The location of Bollea Road within the existing right-of-way varies based on location. In Calaveras County, the road is centered within the 50-foot right-of-way. In San Joaquin County, the roadway centerline is shifted approximately 5 feet to the east. The existing location of the Bollea Road centerline is based on field surveys that located the centerline stripe of the road.

The proposed roadway alignment will require additional permanent right-of-way to be acquired to accommodate the movement of the centerline alignment and the roadway embankment resulting from raising the Bollea Road profile 0.55 feet. With the 375-foot radius alignment, the new structure will be built within the existing right-of-way, but additional permanent right-of-way will be necessary for the roadway embankment within San Joaquin County and Calaveras County. Additionally, temporary construction easements would be required for the construction staging area and removal of the temporary creek crossing (**Figure 3**).

1.3.2 CONSTRUCTION STAGING AND ACCESS

Surrounding land ownership includes privately held parcels and County-owned ROW. The bridge proposed for replacement is entirely within the County ROW, but project-related impacts such as



SOURCE: San Joaquin County Public Works, 10/25/2016; AES, 07/16/2018

Bollea Road Replacement Project Water Quality Technical Memorandum / 215572 ■

Figure 3
Project Details and Limitations

construction of the temporary creek crossing, culvert installation, and nearby area, may partially occur on private land. A 0.32-acre staging area would be used during the construction and be located within the existing road bed while the detour is in place (**Figure 3**).

1.3.3 IN-STREAM WORK AND DEWATERING

Due to the bridge being a clear span structure, the work proposed within the channel will be limited to removal of the remnants of the old south abutment, removal of the north bridge abutments, removal of the detour, and restoration of the south bank upstream of the bridge. Removal of the detour will include restoration of the north and south banks to their pre-project condition. The restoration of the south bank that sloughed in the storms of 2017 could include benching and compacting earth fill to restore the bank geometry and the installation of revetment to counteract future erosion. Alternatives to rock slope protection will be evaluated during project design.

The expected period of construction is proposed to be between May 1 and October 31 to coincide with the time of year when Bear Creek has little to no flow. In-stream work is anticipated to be conducted during the dry season. Dewatering may be required during removal and installation of the support structure if work cannot be completed during the dry season. Dewatering may also be required during installation of the abutment piles if groundwater is encountered. Water produced during dewatering activities would be pumped, treated, and discharged according to state and regional permits and regulations. During in-water work, all best management practices (BMPs) would be used to reduce the amount of sediment and debris that may be produced.

1.4 APPROACH TO WATER QUALITY TECHNICAL MEMORANDUM

The purpose of the Water Quality Technical Memorandum (Memorandum) is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, for permitting through the National Pollution Discharge Elimination System (NPDES). This Memorandum also includes a discussion of the regulatory framework with respect to water quality, the physical setting of the project site and vicinity, and data on surface water and groundwater resources within the project site. Potential water quality impacts that could occur from construction of the Proposed Project are identified, and recommendations to minimize potential impacts to water quality are proposed.

1.5 PROJECT WORK LIMITS

The existing structure has been determined to be structurally deficient, with a sufficiency rating of 46.8 and is eligible for replacement under the Federal Highway Bridge Program (HBP) administered for FHWA by Caltrans. The Proposed Project includes the removal of the existing bridge to accommodate a replacement structure measuring 67-foot long by 20-foot wide (clear width). The new structure would be composed of two 10-foot-wide traffic lanes and two 2-foot-wide shoulders and would shift the bridge approximately 4 feet to the east. In addition, the new structure would include minor grading, depending on in-field and final designs. Lastly, a 0.32-acre staging area would be used during the construction and be located just southeast of the existing bridge.

Traffic will be maintained during the Proposed Project through the continued use of a temporary creek crossing upstream of the existing bridge. The temporary creek crossing was installed under an emergency permit and consists of four pipes, three 48-inches in diameter and one 36-inches, surrounded by gravel and topped with Class 2 aggregate base. The crossing is located approximately 15 feet east of the existing bridge and connects Bollea Road on either side of the creek.

During construction, work hours shall be limited to 6:00 a.m. to 9:00 p.m. to comply with the San Joaquin County Development Title (Section 9-1025.9). This title specifically exempts construction-related noise impacts associated with the maintenance of public utilities if activities are conducted during daytime hours (6 a.m. to 9 p.m.).

2.0 REGULATORY SETTING

2.1 FEDERAL LAWS AND REQUIREMENTS

2.1.1 CLEAN WATER ACT

In 1972, Congress amended the federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with an NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended the legislation several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are the following:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the CWA. (Section 401 is most frequently required in tandem with a Section 404 permit request, as described below)
- Section 402 establishes the NPDES, a permitting system for discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional water quality control boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of stormwater from industrial/construction sources and Municipal Separate Storm Sewer Systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredged or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

USACE issues two types of Section 404 permits: standard and general permits. General permits are either regional permits or nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize various minor project activities with no more than minimal effects.

There are also two types of standard permits: individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the USACE’s standard permits. For standard permits, the USACE decision to approve is based on compliance with the U.S. Environmental Protection Agency’s (EPA’s) Section 404(b)(1) Guidelines (the Guidelines; 40 Code of Federal Regulations Part 230) and on whether permit approval is in the public interest. The Guidelines were developed by the EPA in conjunction with the USACE and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative that would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a less environmentally damaging practicable alternative to the proposed discharge that would have lesser

effects on waters of the U.S. and would not have any other significant adverse environmental consequences. The Guidelines require documentation that a sequence of avoidance, minimization, and compensation measures (in that order) has been followed. The Guidelines also restrict permitting activities that violate standards for water quality or toxic effluent, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Guidelines, must meet general requirements (See 33 Code of Federal Regulations 320.4.).

2.2 STATE LAWS AND REQUIREMENTS

2.2.1 PORTER-COLOGNE WATER QUALITY CONTROL ACT

California’s Porter-Cologne Water Quality Control Act (known as the Porter-Cologne Act), enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses of surface water and/or groundwater of the state. The Porter-Cologne Act predates the CWA and regulates discharges to waters of the state. Waters of the state include more than waters of the U.S., such as groundwater and surface waters not considered waters of the U.S. Additionally, the Porter-Cologne Act prohibits discharges of “waste,” as defined, and this definition is broader than the CWA definition of “pollutant.” Discharges under the Porter-Cologne Act are permitted by waste discharge requirements (WDRs) and may be required even when the discharge is already permitted or is exempt under the CWA.

The State Water Resources Control Board (SWRCB) and nine RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and for regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Water Quality Control Plan, or Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions, and then establish criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water body segments are based on the designated use and may vary depending on such use. In addition, the SWRCB identifies waters that fail to meet standards for specific pollutants, in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point-source or non-point-source controls (NPDES permits or WDRs), the CWA requires the establishment of total maximum daily loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.2.2 STATE WATER RESOURCES CONTROL BOARD AND REGIONAL WATER QUALITY CONTROL BOARDS

The SWRCB adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

2.2.3 NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PROGRAM

Construction General Permit

Construction General Permit (CGP; Order No. 2009-009-DWQ, as amended by 2010-0014-DWG), was adopted on November 16, 2010, and became effective on February 14, 2011. The permit regulates stormwater discharges from construction sites that result in a Disturbed Soil Area (DSA) of 1 acre or more, and/or from smaller sites that are part of a larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective Stormwater Pollution Prevention Plan (SWPPP). In accordance with the Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA of less than 1 acre.

By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than 1 acre is subject to this CGP if there is potential for substantial water quality impairment resulting from the activity, as determined by the RWQCB. Operators of regulated construction sites are required to develop SWPPPs; implement sediment, erosion, and pollution prevention control measures; and obtain coverage under the CGP.

The CGP separates projects into Risk Levels 1, 2, and 3. Risk levels are determined during the planning and design phases of a project and are based on potential erosion and transport to receiving waters. Requirements apply according to the risk level determined. For example, a Risk Level 3 (highest risk) project would require compulsory monitoring of stormwater runoff pH and turbidity, as well as pre- and post-construction aquatic biological assessments during specified seasonal windows.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to waters of the U.S. must obtain a Section 401 water quality certification, which certifies that the project would be in compliance with state water quality standards. The most common federal permit triggering Section 401 certification is a Section 404 permit, issued by the USACE. Section 401 certification is obtained from the appropriate RWQCB, dependent on the project location, and must be obtained before the USACE issues a Section 404 permit.

In some cases, the RWQCB may have specific concerns with regard to discharges associated with a project. As a result, the RWQCB may issue WDRs, under the Porter-Cologne Act, that define activities such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that must be implemented to protect or benefit water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.2.4 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

California Endangered Species Act

The California Endangered Species Act (CESA) declares that deserving plant or animal species will be given protection by the state because they are of ecological, educational, historical, recreational,

aesthetic, economic, and/or scientific value to the people of the state. The CESA established that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats. Under state law, plant and animal species may be formally designated as rare, threatened, or endangered by official listing by the California Fish and Wildlife Commission. Take is not permitted on these listed species without the appropriate permits.

California Environmental Quality Act

Section 15380(b) of the State CEQA Guidelines provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. State CEQA Guidelines Section 15380 defines “endangered” species of plants, fish, or wildlife as those whose survival and reproduction in the wild are in immediate jeopardy and “rare” species as those who are in such low numbers that they could become endangered if their environment worsens. Therefore, a project will normally have a significant effect on the environment if it will substantially affect a rare or endangered species or the habitat of the species. The significance of impacts on a species under CEQA must be based on analyzing actual rarity and threat of extinction, despite legal status or lack thereof.

California Fish and Game Code

The California Fish and Game Code defines take (Section 86) and prohibits taking of a species listed as threatened or endangered under the CESA (California Fish and Game Code Section 2080), or otherwise fully protected (California Fish and Game Code Sections 3511, 4700, and 5050). CESA Section 2081(b)-(c) allows the California Department of Fish and Wildlife (CDFW) to issue an incidental take permit for a state-listed threatened or endangered species if specific criteria are met (as outlined in 14 California Code of Regulations Sections 783.4(a)-(b) and California Fish and Game Code Section 2081(b)).

California Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird, as designated in the federal Migratory Bird Treaty Act (MBTA) or any part of such migratory nongame bird, except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a protected species or specified bird occurs, an applicant must design the project to avoid all take; the CDFW cannot provide take authorization under the CESA.

Streambed alteration agreements, as permitted under California Fish and Game Code Section 1602, are required when any permanent or temporary impacts on stream or lakebeds would take place. These impacts include a substantial diversion or obstruction of the natural flow of any river, stream, or lake and a deposition of debris, waste, or other materials into a river, stream, or lake. Because the Proposed Project may involve work within the stream channel of Bear Creek, a Section 1602 permit from the CDFW would be required.

2.3 REGIONAL AND LOCAL REQUIREMENTS

2.3.1 CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

The Central Valley Regional Water Quality Control Board (CVRWQCB), Region 5 Basin Planning department, maintains two Basin Plans covering the Central Valley Region. One plan focuses on the Tulare Lake Basin, and the other covers the Sacramento and San Joaquin River Basins. Both plans were originally adopted in 1975 and have been updated and revised since that time. The Proposed Project lies within the San Joaquin River Basin, for which the Basin Plan was last revised in July 2016 (CVRWQCB, 2016).

SAN JOAQUIN COUNTY GENERAL PLAN

The San Joaquin County General Plan Open Space and Conservation Element (San Joaquin, 1992) contains procedures for addressing water quality impacts on groundwater and surface water. The general plan contains specific measures for groundwater and surface water monitoring programs and requires the use of BMPs designed to protect surface water and groundwater from the adverse effects of construction activities. Additionally, the general plan aims to protect wetland and riparian habitats (San Joaquin, 1992).

3.0 AFFECTED ENVIRONMENT

3.1 DESCRIPTION OF THE EXISTING CONDITIONS

This section describes the physical condition of the project site and surrounding areas, including population and land use, topography, hydrology, geology and soils, and biological communities. The project is located on the boundary line between Calaveras and San Joaquin Counties. Calaveras County is located in the central-western portion of the Sierra Nevada geomorphic province, and its topography and geology are heavily influenced by the Sierra Mountain range. The western edge of Calaveras County and the eastern edge of San Joaquin County are characterized by rolling hills approaching the foothills of the Sierra Nevada range (CDMG, 1962; San Joaquin, 2016). Wallace is a census-designated place (CDP) with an estimated population of fewer than 1,000 individuals. The Bollea Road Bridge serves fewer than ten residential parcels.

The land immediately surrounding the project site is privately owned and is utilized primarily for residential and agricultural uses.

3.1.1 TOPOGRAPHY

The topography of the surrounding area is heavily influenced by the rolling hills and foothills that gradually become the Sierra Nevada Mountains to the east. The project site is situated at an approximate elevation of 200 feet above mean sea level.

3.1.2 REGIONAL AND LOCAL HYDROLOGY

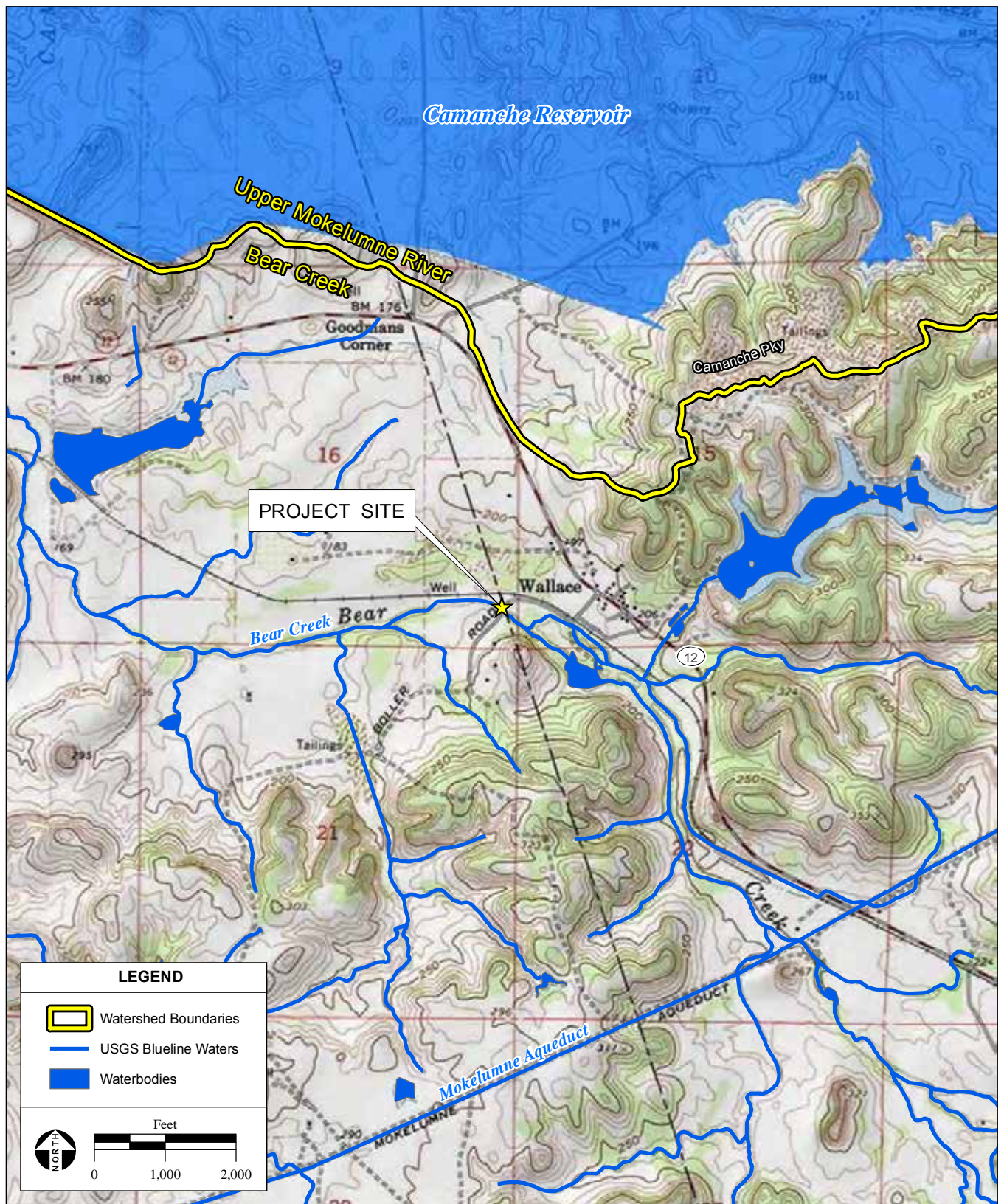
Regional Hydrology

The project site is located within the Eastern San Joaquin Subbasin of the San Joaquin Delta Basin. The Eastern San Joaquin Subbasin covers approximately 1,105 square miles and includes portions of the Sacramento, San Joaquin, Cosumnes, Mokelumne, and Calaveras Rivers.

Local Hydrology

The project site is located within the Lower Bear Creek sub-watershed within the San Joaquin Delta. This sub-watershed drains approximately 24,474 acres, mostly in San Joaquin County. This sub-watershed is bordered with the Camanche Reservoir-Mokelumne River sub-watershed to the north and the Upper Bear Creek sub-watershed to the east (USEPA, 2015). Bear Creek flows through the project site from east to west. A map of significant water features in the vicinity of the project site, including watershed boundaries and surface waterbodies, is presented as **Figure 4**.

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) was used to detect any previously mapped aquatic features within the study area. The NWI map depicts only one aquatic feature within the study area, a palustrine system, temporary flooded and forested streambed (USFWS, 2017). This feature is consistent with Bear Creek, which flows through the center of the project site.



SOURCE: USGS National Hydrological Database, 9/2017; "Wallace, CA"
USGS 7.5 Minute Topographic Quadrangle, T4N, R9E Section 16, Mt. Diablo
Baseline & Meridian; AES, 7/16/2018

Bollea Road Replacement Project Water Quality Technical Memorandum / 215572 ■

Figure 4

Water Features

3.1.3 PRECIPITATION AND CLIMATE

The project site is situated between the San Joaquin Valley to the west and the Sierra Nevada foothills to the east. San Joaquin County's climate is generally dry, with long summers and little rain. Average annual rainfall ranges from 8 to 18 inches. In June, the average daily temperature ranges from maximums of 94 degrees to minimums of 59 degrees Fahrenheit, while in January the average daily temperatures range from a maximum of 53 degrees to minimums of 36 degrees Fahrenheit (San Joaquin, 2016).

Floodplain

The project site is located within an area mapped as flood zone "X", an area determined to be outside the 0.2 percent annual chance (500-year) floodplain (San Joaquin, 2017).

3.1.4 GROUNDWATER HYDROLOGY

Groundwater levels have steadily declined in the Eastern San Joaquin Subbasin over the past 40 years, at an average rate of 1.7 feet per year and up to 100 feet, cumulatively, in some areas of the subbasin (CDWR, 2006). This decline has been largely attributable to agricultural operations. The San Joaquin Delta is one of California's most productive agricultural areas, and a significant amount of groundwater is drawn upon for irrigation.

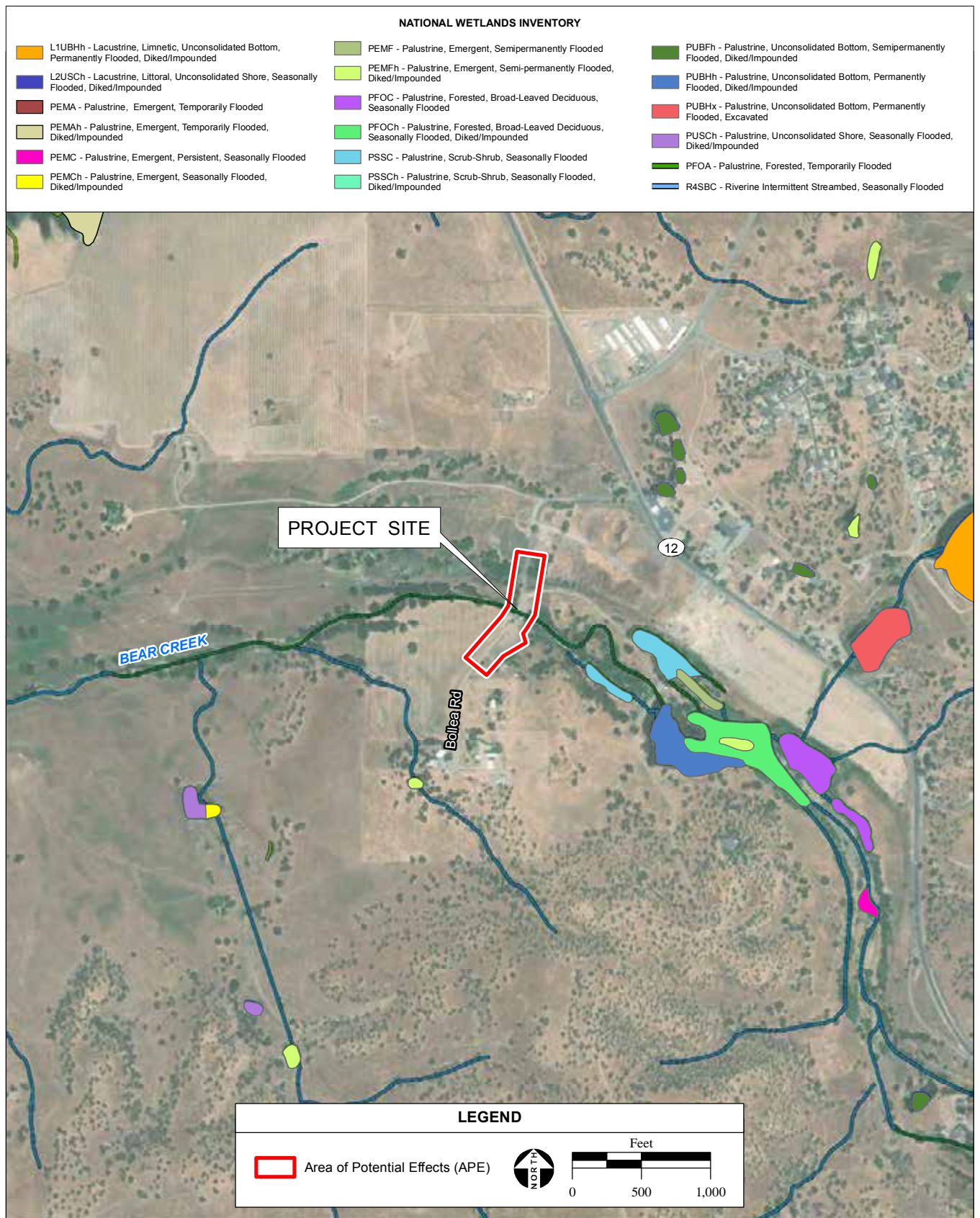
3.1.5 WATERS OF THE U.S. AND STATE

The U.S. Fish and Wildlife Services (USFWS) National Wetlands Inventory (NWI) was used to detect any previously mapped aquatic features within the project study area. The NWI map depicts a freshwater palustrine forested temporary flooded wetland (PFOA) and an intermittent streambed seasonally flooded riverine wetland (R4SBC) (USFWS, 2017). The NWI map of the project site is shown as **Figure 5**. Delineated wetlands are shown on **Figure 6** from the site visit.

3.1.6 GEOLOGY AND SOIL EROSION POTENTIAL

The project site is located along the western perimeter of the Sierra Nevada geomorphic province, within the foothills that serve as the base of the Sierra Nevada Mountain Range. Natural Resource Conservation Service (NRCS) information was available for all soils on the San Joaquin side of the county boundary; however, soils on the Calaveras County side have not yet been mapped by the NRCS. It is reasonably assumed that soils will be similar throughout the project site due to its relatively small surface area.

Soils within the project site (**Table 1**) are mapped as Acampo sandy loam, 0 to 2 percent slopes; Dumps, tailings; and Pentz sandy loam, 2 to 15 percent slopes (Natural Resources Conservation Service (NRCS), 2017, **Appendix B**) (**Figure 7**). Dumps, tailings soils are not discussed further as it entails rock and soil brought in from outside sources.



SOURCE: USDA NAIP Aerial Photograph, 6/2014; USFWS National Wetlands Inventory, 1991; AES, 10/9/2018

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Figure 5
National Wetlands Inventory



SOURCE: "Wallace, CA" USGS 7.5 Minute Topographic Quadrangle,
T4N, R9E Section 16, Mt. Diablo Baseline & Meridian; AES, 7/16/2018

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Figure 6
Wetlands and Waters Delineation Map

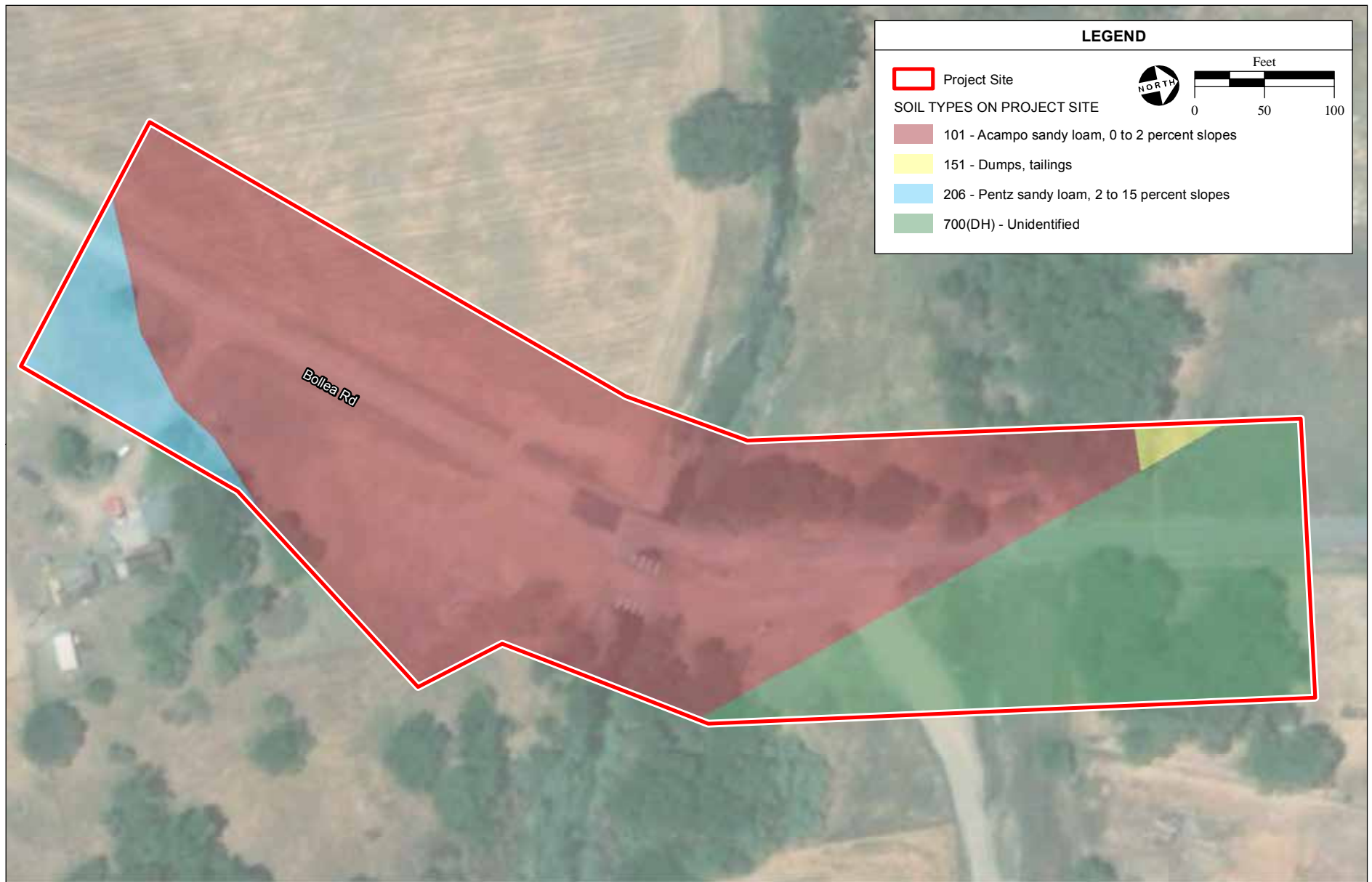


TABLE 1
SOIL TYPES WITHIN THE PROJECT SITE

Soil Name and Soil Map Unit Symbol	Parent Material	Depth to Restrictive Layer	Depth to Water Table	Drainage Class	Runoff Class	Percent Area
Acampo sandy loam, 0 to 2 percent slopes	Alluvium derived from granite	40 to 60 inches to duripan	More than 80 inches	Moderately well drained	Very low	68.0
Pentz sandy loam, 2 to 15 percent slopes	Residuum weathered from basic andecitic, tuffaceous sandstone	10 to 20 inches to pralithic rock	More than 80 inches	Well drained	Low	5.4
Source: NRCS, 2017						

Soil Erosion Potential

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of the factors used in the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year (NRCS, 2017; **Appendix B**). The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (KSAT). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Erosion factor KW (whole soil) indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments, which are typical of the soils in the project site and vicinity. Acampo soils have a 0.20 K Factor rating and Pentz soils have a K Factor rating of 0.32. Acampo soils have a higher potential for erosion (NRCS, 2017).

3.1.7 BIOLOGICAL COMMUNITIES

The Action Area is located on the border of San Joaquin County and Calaveras County within the northern terraces of the Central California Valley. This area has a semi-arid Mediterranean climate regime characterized by hot, dry, sunny summers and cool, rainy winters. Summers are hot and dry with little to no rain, and winters are characterized by foggy days and cooler temperatures. The mean annual temperature range in San Joaquin County is approximately 46 to 75 degrees Fahrenheit (°F). The average annual precipitation range in San Joaquin County is approximately 0 to 3.5 inches, with the maximum usually occurring during the month of January. This climate data was collected from 1980-2010 (The Weather Channel, 2017).

The Action Area is situated within gently rolling terrain and is situated at elevations that range from approximately 180 to 266 feet (55 to 81 meters) above mean sea level. Bear Creek, a tributary to the Delta, flows westward through the Action Area. Bear Creek's connection to the Delta occurs through a

series of natural and agricultural canals, running approximately 33 miles to the southwest. The Action Area falls within climate Zone 12. Climate Zone 12 experiences cool winters and hot summers with winter rains typically occur from November to April, and high summer temperatures reaching over 100°F.

The Action Area is situated in a rural residential/agricultural setting west of the community of Wallace, CA. Surrounding land uses include rural residential, agriculture, and undeveloped open land. The Action Area is predominantly undeveloped and uncultivated. Several residences and associated structures are located nearby.

Ruderal Grassland

The ruderal grassland plant community is found in several locations north of the existing bridge. The biological survey occurred outside of the primary blooming period for ruderal grassland species. As a result, identification of ruderal grassland species was not definitive. However, species typical of this habitat type in this region include *Amsinckia* spp. (e.g., *menziesii*, *tessellata*), *Bromus* spp. (e.g., *hordeaceus*, *diandrus*), *Brachypodium distachyon*, *Lasthenia californica*, *Plantago erecta*, *Vulpia microstachys*, *Lotus purshianus*, *Nassella cernua*, and *Plagiobothrys nothofulvus*. No animals were observed within this habitat.

Valley Foothill Riparian

Valley foothill riparian habitat along either side of Bear Creek consists predominately of densely clumped oaks (*Quercus* spp.). A separate span of valley foothill riparian habitat occurs in the northwestern portion of the Action Area. This riparian habitat is dominated by willows (*Salix* spp.), oaks, and bare ground. Several species of migratory birds were observed in this habitat during the site survey.

Barren

Roadside ditches are present throughout the Action Area and connect to those running along either side of Bollea Road. The western ditch along Bollea Road connects to Bear Creek above the OHWM and is covered in dense vegetation. Northeast of the existing bridge, there is a private property that contains a man-made pond and an area of bare ground. A dirt road is also present to the east and connects a private residence to Bollea Road. South of the existing bridge is a row crop field to the west and a residential house and yard to the east. Lastly, at the time of the survey, ongoing construction of a temporary vehicular bypass, approximately 15 feet upstream of the existing bridge, was occurring.

Riverine (Bear Creek)

Bear Creek, a USGS blue-line perennial stream, passes through the Action Area and flows generally from east to west. A USGS blue-line stream is a watercourse identified by the USGS as being potentially jurisdictional and must be investigated during preliminary environmental studies. The OHWM of the stream was delineated based on a drastic change in terrestrial vegetation, sorted coarse substrate, and undercut banks, all indicators of the regular presence of moving water within a riverine system. Within the stream channel, the bed consisted of silt and sand with dispersed cobble. Terrestrial vegetation was absent from the channel except for small amounts of algal mats downstream of the bridge. Aerial

imagery and aquatic invertebrates were used to classify the stream as perennial as water was present within the stream channel during the March 8, 2017 site visit. No fish or other aquatic animals were observed within the habitat.

Lacustrine

Approximately half of a 0.217-acre man-made pond is fenced within private property in the northeastern portion of the Action Area. It has raised berms on all sides with overflow culverts that spill into the roadside ditches. Vegetation is dominated by large willows (*Salix ssp.*) and a clear OHWM was observed.

Topographic Depression

An approximately 0.022-acre topographic depression, with obvious wetland vegetation, was evaluated for the three parameters required to be considered a wetland. Although the herbaceous ground cover is 100% obligate vegetation (rushes), and wetland hydrology is present (observable surface water), an investigation of the soils revealed that it did not meet any of the hydric soil indicators for the Arid West Region and therefore do not meet the requirements for a wetland under the three-parameter wetland approach by the USACE.

3.2 WATER QUALITY OBJECTIVES/STANDARDS AND BENEFICIAL USES

Beneficial water uses are critical to water quality management in California. State law defines beneficial uses to include domestic, municipal, agricultural, and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish/wildlife and other aquatic resources or preserves (CVRWQCB, 2016). Beneficial uses that currently apply to surface waters of the various basins statewide are listed with the SWRCB in each RWQCB's Basin Plan. In some cases, a beneficial use may not be applicable to the entire body of water or its tributary systems. In these cases, the RWQCB's judgment is applied (CVRWQCB, 2016). Although the San Joaquin River Basin Plan does not explicitly set beneficial uses for Bear Creek, it does set existing beneficial uses of the San Joaquin River, to which Bear Creek is tributary:

- Municipal
- Agriculture
- Industry
- Recreation
- Freshwater Habitat
- Spawning
- Wildlife Habitat

Additionally, the San Joaquin River Basin Plan includes water quality objectives for inland surface waters in the region for the following (CVRWQCB, 2016):

- Bacteria
- Biostimulatory substances
- Chemical constituents
- Cryptosporidium and Giardia
- Color
- Dissolved oxygen
- Floating material
- Mercury
- Methylmercury
- Oil and grease
- pH
- Pesticides
- Radioactivity
- Salinity
- Sediment
- Settleable material
- Suspended material
- Tastes and odors
- Temperature
- Toxicity
- Turbidity

3.3 EXISTING WATER QUALITY

Bear Creek, the main waterbody within the project site, is a tributary to the San Joaquin River. The San Joaquin River stretches over 366 miles of central California. Three major watersheds have been delineated within the region, which includes the San Joaquin River, Sacramento River, and Tulare Lake Basins. The San Joaquin River Basin connects to the San Francisco Bay Delta.

3.3.1 LIST OF IMPAIRED WATERS

The San Joaquin River is listed on the CWA Section 303(d) List of Impaired Waters, Category 5. The Category 5 list requires the development of a TMDL for pollutants. The San Joaquin River is impaired for separate constituents within different portions of the River. In the lower portion, the river is impaired from agricultural pesticides and temperature. Other segments of the San Joaquin River are listed for pollutants such as temperature, mercury, boron, pesticides, selenium, arsenic, *Escherichia coli* (*E. coli*), and insecticides (SWRCB, 2018). Bear Creek is a tributary to the northern portion of the San Joaquin River into the San Joaquin Delta and is currently listed for copper, diazinon, *E. coli*, and low dissolved oxygen impairments on the Section 303(d) list (SWRCB, 2018).

3.3.2 AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE

The results of an environmental assessment of the biological study area (BSA) observed no special-status plant or animal species. Based on habitat analysis, seven federal, State, or California Native Plant Society (CNPS) listed plant species have the potential to occur within the BSA. Federal and state listed animal species with the potential to occur in or surrounding the BSA include three amphibians, one bird, two fish, and one reptile.

Both temporary and permanent impacts on habitats would result from the Proposed Project. Most permanent impacts would occur within the barren habitat. Approximately 0.004 acres of permanent impact would occur to a Water of the U.S. (Bear Creek), but avoidance and minimization measures have been included that would ensure required permits be obtained and adhered to. Approximately 0.007 acres of temporary impact to Bear Creek would occur due to the staging area and removal of the temporary stream crossing. Avoidance and minimization measures have been included to ensure that

the removal of the crossing and all other in-stream work occurs during the dry season and appropriate permits be obtained and adhered to. No other permanent or temporary impacts would occur within other aquatic features within the biological study area.

Permits will be required for temporary and permanent impacts on the potential Water of the U.S., including a Section 401 Certification from the Regional Water Quality Control Board, a Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife, and coverage under U.S. Army Corps of Engineers 404 permit.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 POTENTIAL IMPACTS ON WATER QUALITY

The Proposed Project may result in potential impacts on surface water quality, groundwater quality, and site drainage during construction and operation. These impacts are described in more detail below, and mitigation measures are recommended in **Section 5.0** to reduce potential impacts of the Proposed Project.

4.1.1 SHORT-TERM IMPACTS DURING CONSTRUCTION

Construction activities associated with the Proposed Project would result in temporary disturbance within and adjacent to Bear Creek, a perennial stream. Direct effects on Bear Creek would include temporary fill in the creek bed for construction of the temporary creek crossing, excavation and pile drilling to construct the bridge abutments and piers, re-grading the creek banks in front of the abutments, and potential deposition of debris and dust during demolition of the existing bridge.

Earth-moving activities needed to construct the temporary creek crossing and new bridge structure, including excavation, placement of rock and fill, and pile drilling, could result in a temporary increase in turbidity and sediment loads in Bear Creek. Temporary increases in turbidity could also result from creek bed disturbance during construction of the bridge pier and abutments, as well as from regrading of the creek banks in front of the abutments if water should be present during these construction activities. Construction activities could also result in increased erosion on the project site, potentially degrading downstream water quality during storm events. Additionally, demolition of the existing bridge could cause debris and dust to fall into the creek, potentially degrading water quality in Bear Creek.

BMPs would be implemented to help prevent debris and dust from entering Bear Creek. It is recommended that all construction activities taking place within the creek bed occur during dry months when no water is present in Bear Creek within the project site. As discussed in **Section 5.0**, if construction in the creek bed cannot be limited to dry months, permit conditions shall include provisions for sediment control during construction and removal of fill within the creek. All conditions within the RWQCB Section 401 Water Quality Certification, USACE Section 404 Nationwide Permit, and CDFW Section 1602 Streambed Alteration Agreement shall be met.

Due to the depth of excavation required for the pier and abutment piles (approximately 25 feet below ground surface), dewatering of groundwater may be necessary. If dewatering were required, a diversion or isolation plan would be developed and utilized during pile drilling. Discharges from dewatering could affect water quality if the effluent contains high levels of chemical pollutants or sediment. Any water produced from the dewatering activities would be pumped, treated, and discharged in accordance with applicable regulations and Proposed Project permits, including the General Waste Discharge Requirements and NPDES Permit for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters.

The use of construction equipment and other vehicles on the project site during construction could lead to potential water quality impacts due to accidental spills of gasoline, diesel fuel, motor oil, hydraulic fluid, or other vehicle-related pollutants. The improper handling, storage, or disposal of these materials, or the improper cleaning of machinery, could lead to surface water or groundwater degradation. As discussed in **Section 5.0**, typical BMPs have been recommended for implementation during construction to limit and often eliminate effects of such accidental releases. As discussed in **Section 5.0**, the Proposed Project would also comply with the NPDES Construction Stormwater General Permit, including the preparation and implementation of a SWPPP that identifies erosion, sediment, and stormwater BMPs to protect water quality during construction of the Proposed Project.

With implementation of measures presented in **Section 5.0**, the Proposed Project would not have significant adverse effects on water quality during construction.

4.1.2 LONG-TERM IMPACTS DURING OPERATION AND MAINTENANCE

Operation of the new replacement bridge would not permanently alter or create sources of water pollution, as the Proposed Project is not expected to increase the number of vehicles operating along Bollea Road. As such, there would be no increase in the pollutant loading of Bear Creek.

The Proposed Action includes the removal of the existing bridge to accommodate a replacement structure measuring 20 feet wide by 67 feet long. The new structure would be a 67-foot long by 20-foot wide (clear width), single-span, post-tensioned concrete slab bridge supported on seat-type abutments and 24-inch cast-in-drilled-hole (CIDH) concrete piles and would shift the bridge approximately 4 feet to the east or 23 feet to the west depending on which alignment is chosen. In addition, a 0.32-acre staging area would be used during the construction and be located just southeast of the existing bridge. Lastly, the Proposed Project (including all construction elements and staging areas) would be constructed within an approximately 925-foot-long area (north-south) along Bollea Road, extending approximately 75 feet from either edge of Bollea Road; this is the horizontal area of potential impacts for the Proposed Action. Since the existing bridge would be removed, the overall net change in impervious surface area would be minimal. The operation and maintenance of the Proposed Project would have no long-term impacts on runoff or water quality and the project design would likely decrease drift accumulation impacts in the vicinity of the project site.

4.1.3 CUMULATIVE IMPACTS

As discussed in **Section 4.1.1** and **Section 4.1.2** above, the Proposed Project would not significantly adversely affect water quality during construction or operation and maintenance. There are no other known projects in the vicinity of the project site that would contribute to water quality effects on Bear Creek. The Proposed Project would minimally increase impervious surfaces at the project site to accommodate the new bridge consistent with current standards. Future development in the watershed would be required to control stormwater associated with increases in impervious surfaces; comply with federal, state, and local regulations similar to the Proposed Project; and implement BMPs and other measures to reduce water quality impacts on the maximum possible extent. Therefore, the Proposed Project's effects on water quality would not be cumulatively considerable.

5.0 AVOIDANCE AND MINIMIZATION MEASURES

No long-term impacts are anticipated with operation and maintenance of the Proposed Project. However, short-term impacts on surface water and groundwater quality could occur during construction of the Proposed Project. All BMPs and other measures shall be prepared in consultation with the project engineer, San Joaquin County, Caltrans, the CVRWQCB, and other appropriate agencies.

The Proposed Project would be required to obtain appropriate permits associated with construction in the creek bed. The County shall obtain all necessary permits to construct the Proposed Project and implement all permit terms required by the regulatory agencies. Required permits include CWA Section 404 Nationwide Permit from USACE, CWA Section 401 Water Quality Certification from RWQCB, Section 1602 Streambed Alteration Agreement from CDFW, and NPDES General Permit from the SWRCB.

Recommended measures to avoid and minimize the Proposed Project's effects on water quality are as follows:

WQ-1: Installation of Temporary Fencing around Bear Creek

All in-stream work shall be limited to the minimal area required for construction of the Proposed Project. Prior to commencement of construction, the County shall ensure that temporary construction barrier fencing and/or silt fencing is installed north of the existing bridge and south of the proposed temporary creek crossing. Construction personnel shall not disturb fenced-off portions of the creek. The exact location of the fencing shall be determined by a qualified water quality specialist in coordination with the project engineer. The fencing shall be checked regularly and maintained until construction activities are complete.

WQ-2: Restore Disturbed Areas to Pre-Project Conditions

All temporarily disturbed areas shall be returned to pre-project conditions upon completion of Proposed Project construction. All fill utilized for construction of the temporary creek crossing shall be removed from Bear Creek to the maximum extent possible.

WQ-3: Limit In-Stream Work to Dry Season

All in-stream construction activities shall be performed during the dry season when no water is present in Bear Creek. In the event that it is not possible to complete in-stream work during the dry season, project permits shall include provisions for dewatering, removal of fill within the stream, and sediment control. All construction activities shall conform to all applicable conditions within the issued permits.

WQ-4: Develop and Implement Dewatering Plan

If dewatering is required, the contractor shall develop a dewatering plan describing the methods, materials, quantities, and locations of dewatering activities. All dewatering discharges shall adhere to the requirements of the General Waste Discharge Requirements and NPDES Permit for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters. A Notice of Intent shall be submitted to the CVRWQCB for approval before dewatering activities

may commence and a completed Notice of Termination shall be submitted to the CVRWQCB once the permitted discharge has been completed.

WQ-5: Develop and Implement a Stormwater Pollution Prevention Plan

Construction contractors shall comply with the SWRCB NPDES General Permit. The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the CWA. To comply with the NPDES permit, the County shall file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (i.e., erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), including a description of the type and location of erosion and sediment control BMPs to be implemented at the project site; and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP may include, but are not limited to, the following:

- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas. No disturbed surfaces will be left without erosion control measures in place during the winter and spring months.
- Sediment shall be retained on site by a system of sediment basins, traps, or other appropriate measures.
- A spill prevention and countermeasure plan shall be developed that would identify proper storage, collection, and disposal measures for potential pollutants (such as fuel, fertilizers, and pesticides) used on site. The plan would also require the proper storage, handling, use, and disposal of petroleum products.
- Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to limit land disturbance to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction.
- Surface water runoff shall be controlled by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures such as terraces, dikes, and ditches shall collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, check dams, hay bales, or similar devices shall be used to reduce runoff velocity and erosion.
- Sediment shall be contained when conditions are too extreme for treatment by surface protection. Temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins shall be used to detain runoff water long enough for sediment particles to settle out. Construction materials, including topsoil and chemicals, will be stored, covered, and isolated to prevent runoff losses and contamination of groundwater.
- Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events.

- Fuel and vehicle maintenance areas shall be established away from all drainage courses and design these areas to control runoff.
- Disturbed areas shall be revegetated after completion of construction activities.
- All necessary permits and approvals shall be obtained.
- Sanitary facilities shall be provided for construction workers.

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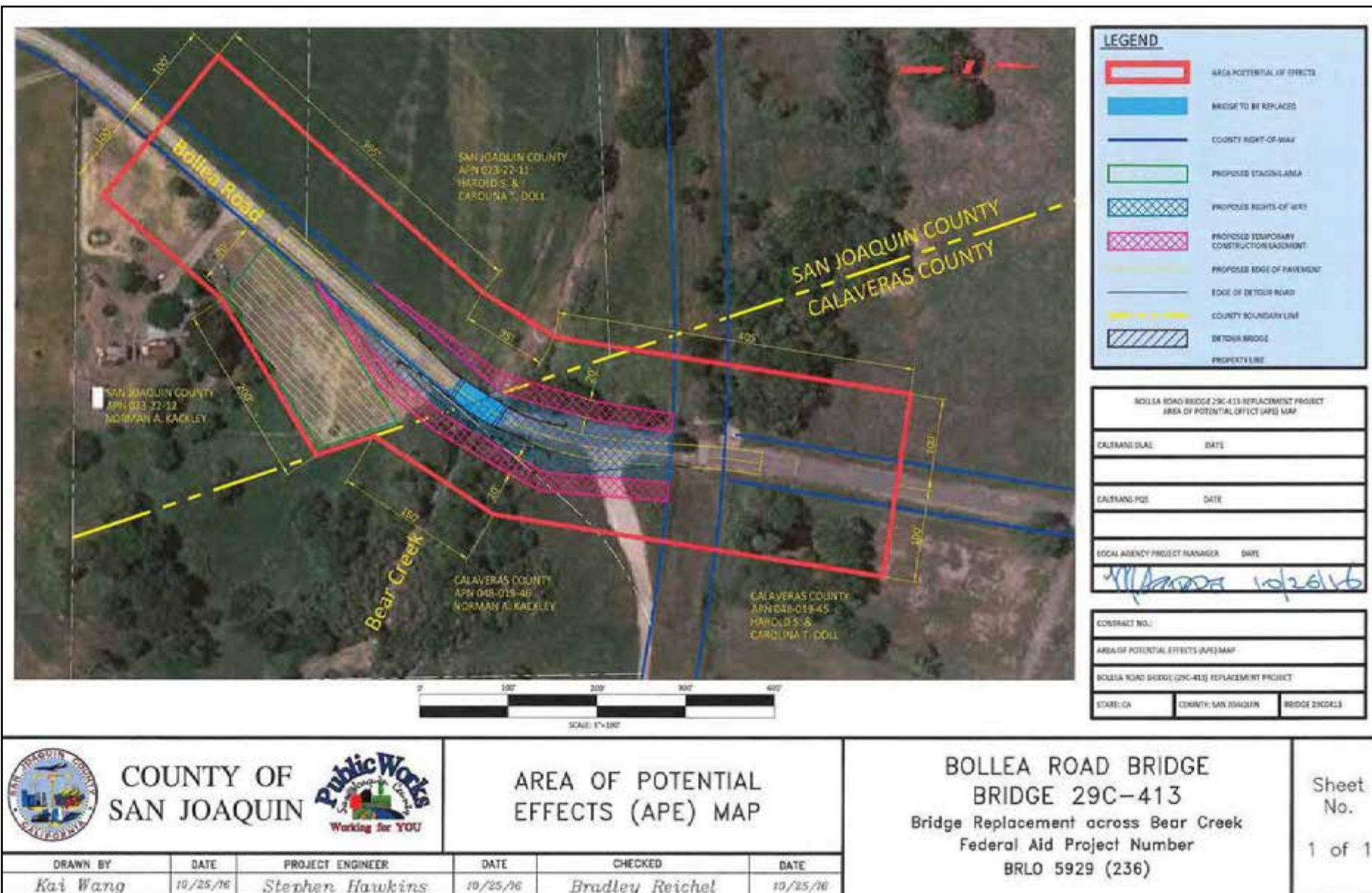
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APPENDICES

APPENDIX A

DRAFT DETAILED SITE PLAN



SOURCE: San Joaquin County Public Works, 10/25/2016; AES, 7/26/2018

Bollea Road Replacement Project Water Quality Technical Memorandum / 215572 ■

APPENDIX B

*NATURAL RESOURCES CONSERVATION SERVICE
WEB SOIL SURVEY*



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties; and San Joaquin County, California



March 28, 2017

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

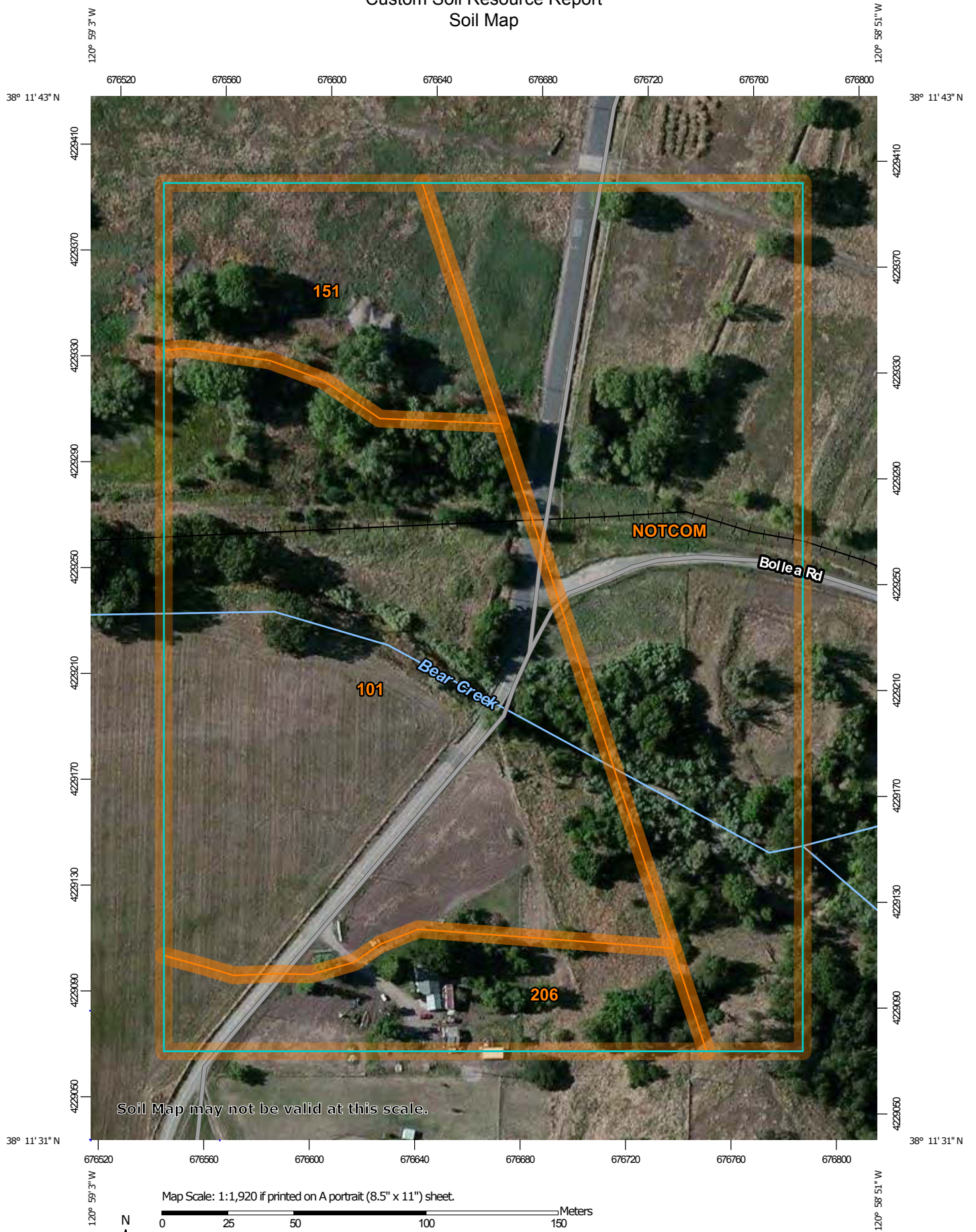
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map


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

Custom Soil Resource Report Soil Map




MAP LEGEND


Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	7.4	37.3%
Subtotals for Soil Survey Area		7.4	37.3%
Totals for Area of Interest		19.7	100.0%

San Joaquin County, California (CA077)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	8.4	42.4%
151	Dumps, tailings	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	1.9	9.5%
Subtotals for Soil Survey Area		12.4	62.7%
Totals for Area of Interest		19.7	100.0%

Map Unit Descriptions

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

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

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

components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties

NOTCOM—No Digital Data Available

Map Unit Composition

Notcom: 100 percent

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

Description of Notcom

Properties and qualities

San Joaquin County, California

101—Acampo sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhr0
Elevation: 10 to 150 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

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

Description of Acampo

Setting

Landform: Fan terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 19 inches: sandy loam
Bw - 19 to 47 inches: sandy loam
Bkqm1 - 47 to 49 inches: cemented
Bkqm2 - 49 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to duripan; 43 to 60 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent

Custom Soil Resource Report

Hydric soil rating: No

Devries

Percent of map unit: 4 percent

Landform: Rims

Hydric soil rating: Yes

Unnamed, fine textured subsoil soils

Percent of map unit: 4 percent

Hydric soil rating: No

Tokay

Percent of map unit: 2 percent

Hydric soil rating: No

151—Dumps, tailings

Map Unit Composition

Dumps: 45 percent

Tailings: 45 percent

Minor components: 10 percent

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

Description of Dumps

Interpretive groups

Land capability classification (irrigated): 8w

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: A

Hydric soil rating: No

Description of Tailings

Interpretive groups

Land capability classification (irrigated): 8w

Land capability classification (nonirrigated): 8w

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Pits

Percent of map unit: 5 percent

Hydric soil rating: No

Xerofluvents

Percent of map unit: 5 percent

Hydric soil rating: No

206—Pentz sandy loam, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hhvd
Elevation: 130 to 300 feet
Mean annual precipitation: 16 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 270 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pentz

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from basic andesitic, tuffaceous sandstone

Typical profile

A - 0 to 4 inches: sandy loam
Bw - 4 to 15 inches: sandy loam
Cr - 15 to 19 inches: weathered bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: SHALLOW LOAMY (R018XD076CA)
Hydric soil rating: No

Minor Components

Bellota

Percent of map unit: 3 percent

Hydric soil rating: No

Alamo

Percent of map unit: 2 percent

Landform: Drainageways

Hydric soil rating: Yes

Pardee

Percent of map unit: 2 percent

Hydric soil rating: No

Redding

Percent of map unit: 2 percent

Hydric soil rating: No

Peters

Percent of map unit: 2 percent

Hydric soil rating: No

Lithic xerorthents

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, deep mod fine texture soils

Percent of map unit: 2 percent

Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Steel

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.


The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report Map—Corrosion of Steel




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 High
 Moderate
 Low
 Not rated or not available


Soil Rating Lines

 High
 Moderate
 Low
 Not rated or not available





Soil Rating Points

 High
 Moderate
 Low
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Steel

Corrosion of Steel— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

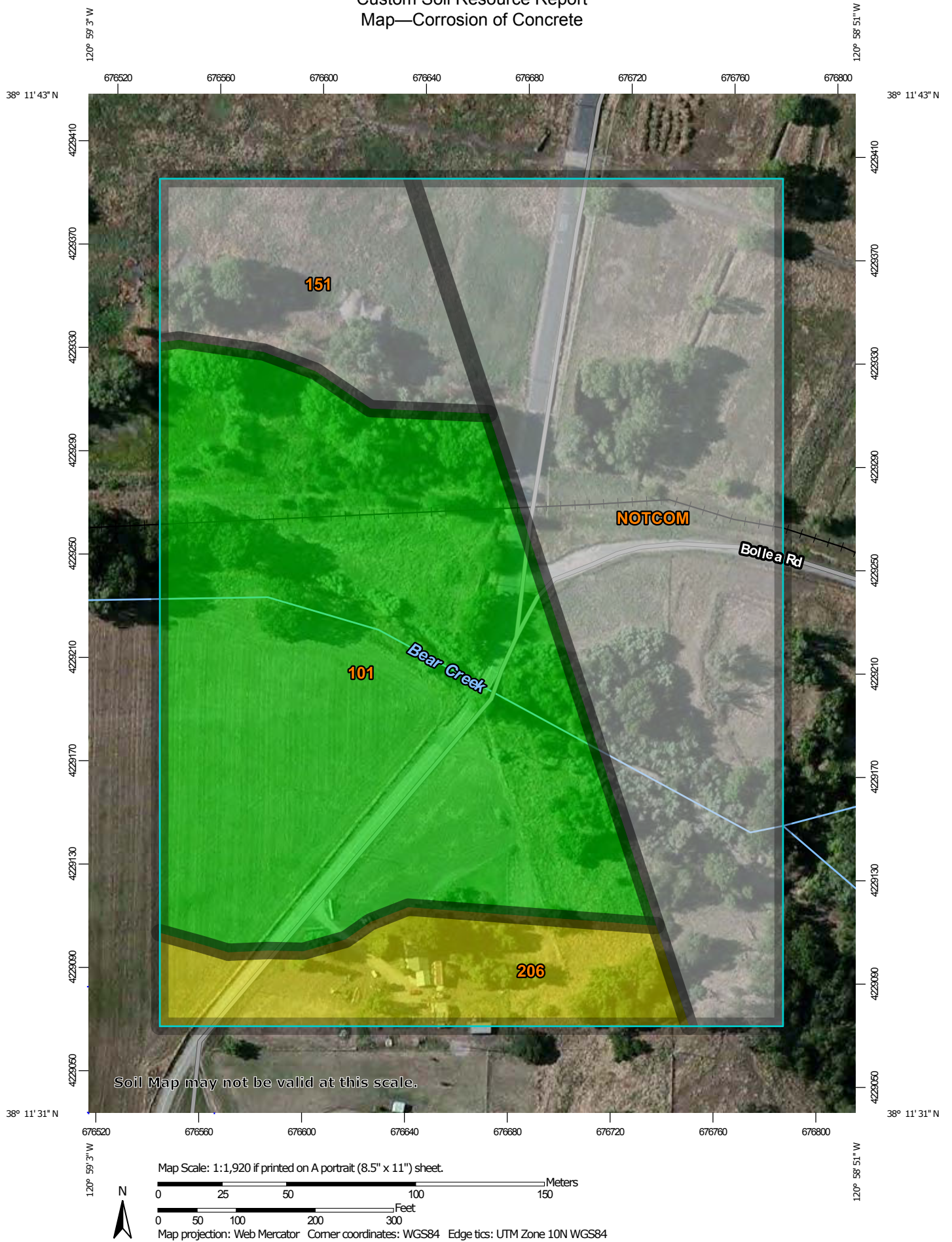
Corrosion of Steel— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderate	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Corrosion of Steel*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher**Corrosion of Concrete**

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.


The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report
Map—Corrosion of Concrete




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 High
 Moderate
 Low
 Not rated or not available


Soil Rating Lines

 High
 Moderate
 Low
 Not rated or not available





Soil Rating Points

 High
 Moderate
 Low
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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Table—Corrosion of Concrete

Corrosion of Concrete— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Corrosion of Concrete— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Low	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Corrosion of Concrete*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher**Land Classifications**

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Soil Taxonomy Classification

This rating presents the taxonomic classification based on Soil Taxonomy.

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. This table shows the classification

of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in sol. An example is Alfisols.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (Ud, meaning humid, plus alfs, from Alfisols).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (Hapl, meaning minimal horizonation, plus udalfs, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

References:

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Custom Soil Resource Report


Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. (The soils in a given survey area may have been classified according to earlier editions of this publication.)

Custom Soil Resource Report Map—Soil Taxonomy Classification






MAP LEGEND

Area of Interest (AOI)




 Area of Interest (AOI)

Soils




Soil Rating Polygons

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available


Soil Rating Lines

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available

Soil Rating Points

-  Coarse-loamy, mixed, thermic Typic Haploxerolls
-  Loamy, mixed, thermic, shallow Ultic Haploxerolls
-  Not rated or not available


Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Soil Taxonomy Classification

Soil Taxonomy Classification— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Soil Taxonomy Classification— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Coarse-loamy, mixed, thermic Typic Haploxerolls	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Loamy, mixed, thermic, shallow Ultic Haploxerolls	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Soil Taxonomy Classification

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Custom Soil Resource Report Map—Farmland Classification



Soil Map may not be valid at this scale.

Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.


0 25 50 100 150 Meters
0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Custom Soil Resource Report









MAP LEGEND








Area of Interest (AOI)

-  Area of Interest (AOI)




Soils








Soil Rating Polygons






-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available







Soil Rating Lines










-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained

-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available


Soil Rating Points

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available


Water Features

MAP INFORMATION

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Farmland Classification

Farmland Classification— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Farmland Classification— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated	8.4	42.4%
151	Dumps, tailings	Not prime farmland	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Not prime farmland	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Ecological Site Name: NRCS Rangeland Site

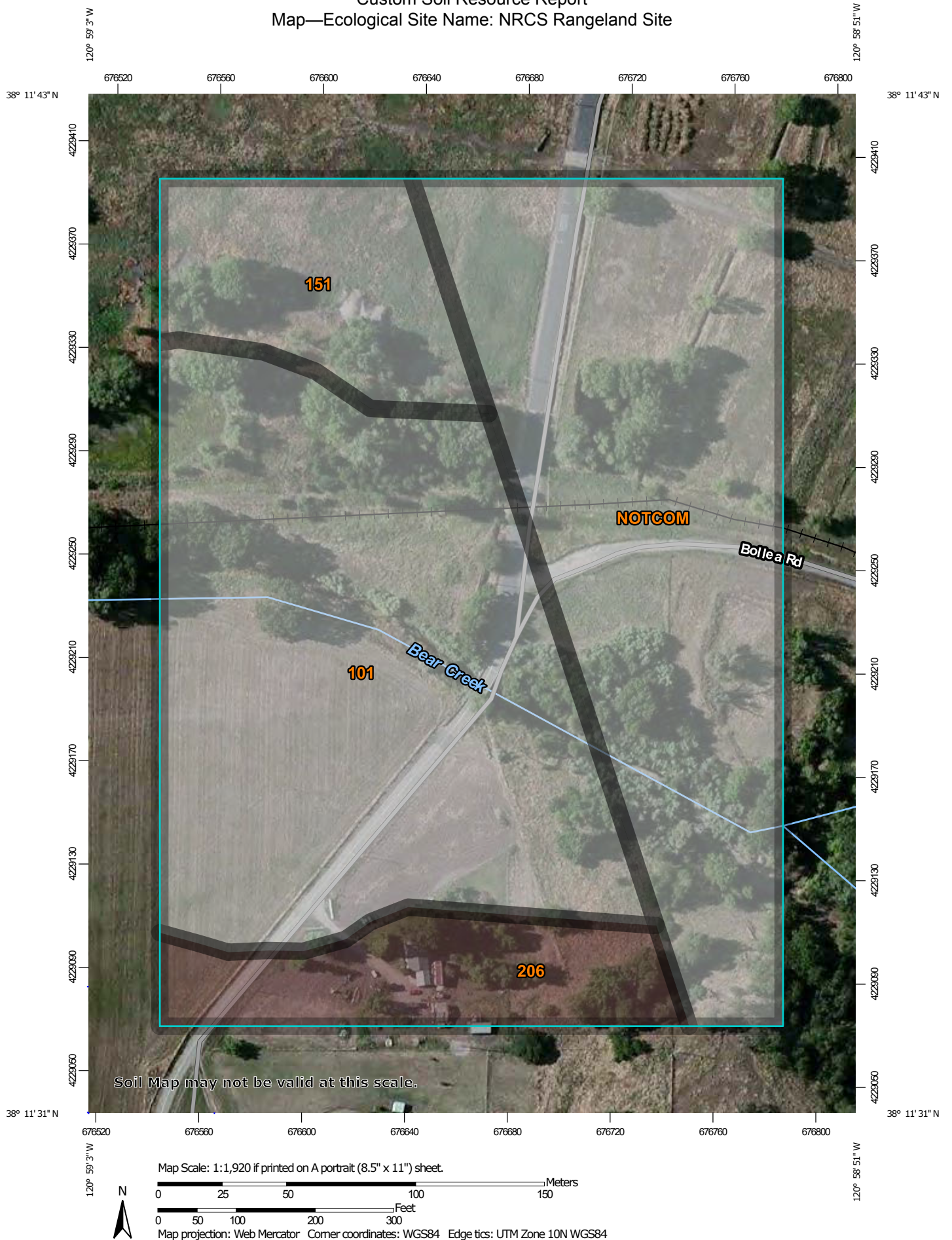
An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service. Descriptions of those displayed in this map and summary table may also be accessed through the Ecological Site Assessment tab in Web Soil Survey.

Ecological sites and their respective unique set of characteristics are uniquely identified by the Ecological Site ID. The same Ecological Site Name may be assigned to multiple Ecological Site IDs. If you wish to display a map of unique

Custom Soil Resource Report


ecological sites, it is recommended that you select the Ecological Site ID attribute from the choice list.

Custom Soil Resource Report
Map—Ecological Site Name: NRCS Rangeland Site





MAP LEGEND

Area of Interest (AOI)



 Area of Interest (AOI)

Soils



Soil Rating Polygons

 SHALLOW LOAMY
 Not rated or not available


Soil Rating Lines

 SHALLOW LOAMY
 Not rated or not available






Soil Rating Points

 SHALLOW LOAMY
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Ecological Site Name: NRCS Rangeland Site

Ecological Site Name: NRCS Rangeland Site— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

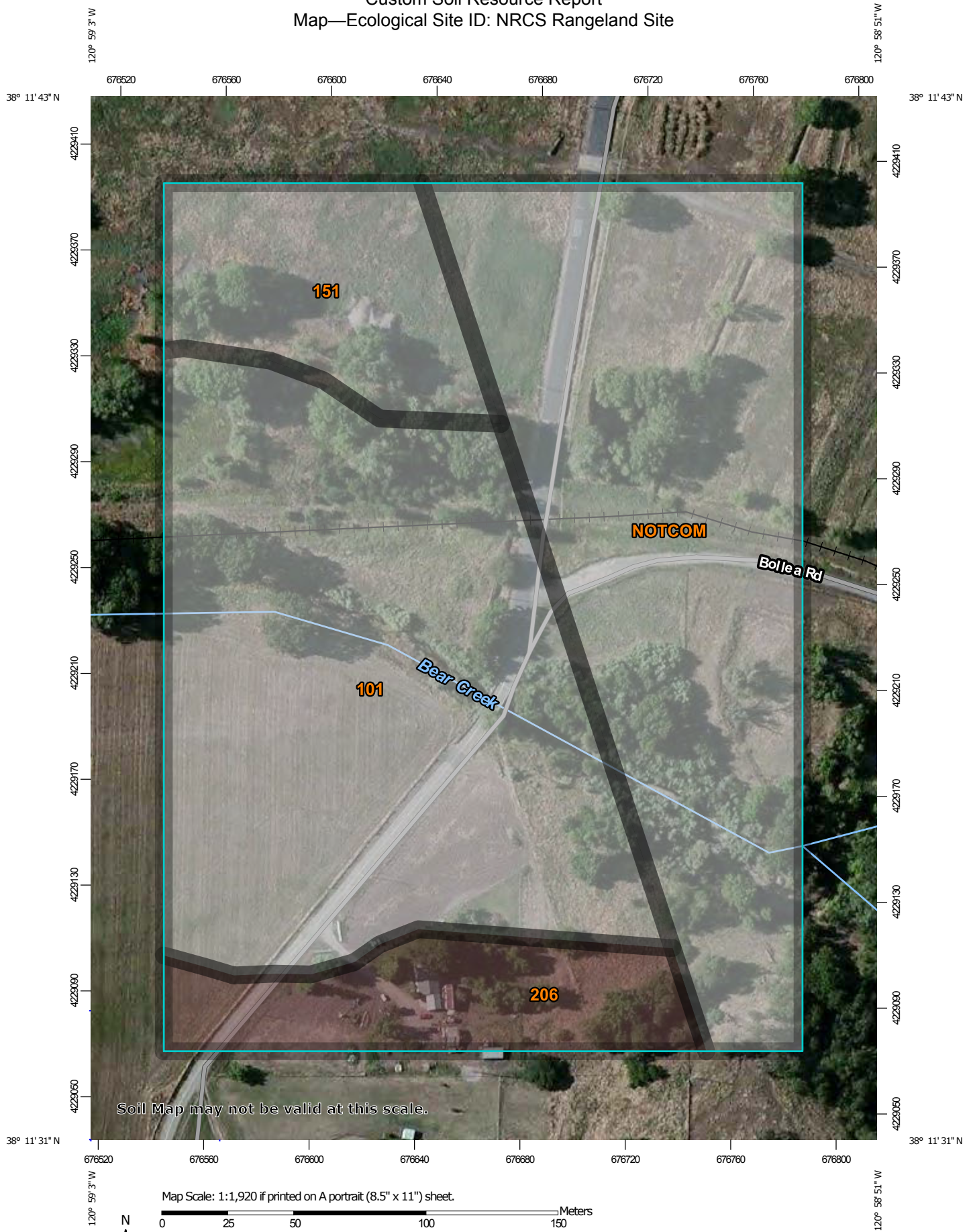
Ecological Site Name: NRCS Rangeland Site— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes		8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	SHALLOW LOAMY	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Ecological Site Name: NRCS Rangeland Site*Class:* NRCS Rangeland Site*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Lower**Ecological Site ID: NRCS Rangeland Site**

An "ecological site ID" is the symbol assigned to a particular ecological site. An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.


Custom Soil Resource Report

Map—Ecological Site ID: NRCS Rangeland Site




MAP LEGEND


Area of Interest (AOI)

 Area of Interest (AOI)


Soils


Soil Rating Polygons

 R018XD076CA


 Not rated or not available


Soil Rating Lines

 R018XD076CA


 Not rated or not available

Soil Rating Points

 R018XD076CA


 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Ecological Site ID: NRCS Rangeland Site

Ecological Site ID: NRCS Rangeland Site— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Ecological Site ID: NRCS Rangeland Site— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes		8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	R018XD076CA	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Ecological Site ID: NRCS Rangeland Site*Class:* NRCS Rangeland Site*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Lower**Land Management**

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Soil Rutting Hazard

The ratings in this interpretation indicate the hazard of surface rut formation through the operation of forestland equipment. Soil displacement and puddling (soil deformation and compaction) may occur simultaneously with rutting.

Custom Soil Resource Report

Ratings are based on depth to a water table, rock fragments on or below the surface, the Unified classification of the soil, depth to a restrictive layer, and slope. The hazard is described as slight, moderate, or severe. A rating of "slight" indicates that the soil is subject to little or no rutting. "Moderate" indicates that rutting is likely. "Severe" indicates that ruts form readily.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Soil Rutting Hazard



Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.


0 25 50 100 150 Meters

0 50 100 200 300 Feet


Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 Severe
 Moderate
 Slight
 Not rated or not available


Soil Rating Lines

 Severe
 Moderate
 Slight
 Not rated or not available





Soil Rating Points

 Severe
 Moderate
 Slight
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Soil Rutting Hazard

Soil Rutting Hazard— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Soil Rutting Hazard— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderate	Acampo (85%)	Low strength (0.50)	8.4	42.4%
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Moderate	Pentz (85%)	Low strength (0.50)	1.9	9.5%
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Soil Rutting Hazard— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Moderate	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Soil Rutting Hazard

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

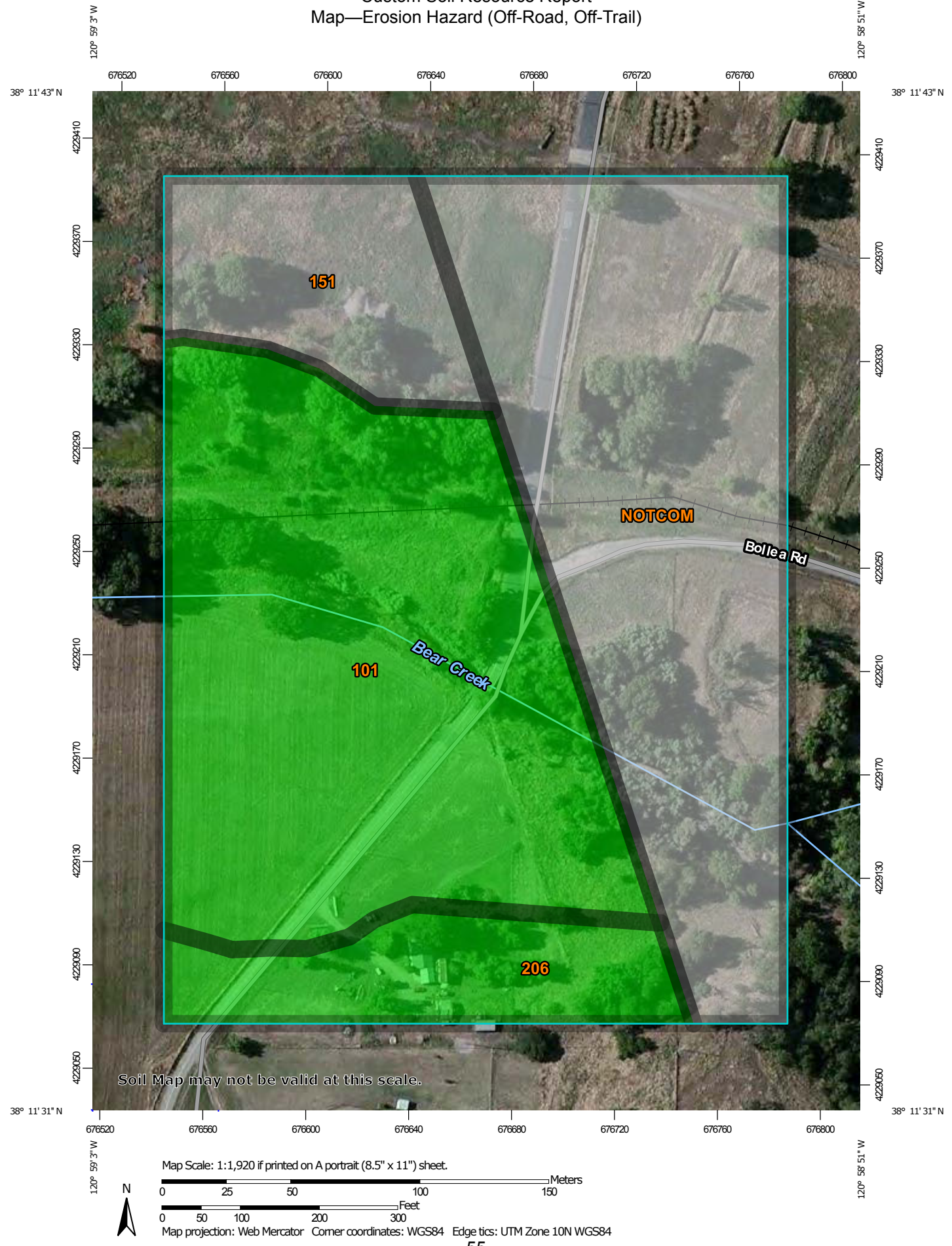
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.


Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail)








MAP LEGEND

Area of Interest (AOI)






 Area of Interest (AOI)

Soils






Soil Rating Polygons

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available


Soil Rating Lines

 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Soil Rating Points




 Very severe
 Severe
 Moderate
 Slight
 Not rated or not available

Water Features


 Streams and Canals

Transportation

 Rails
 Interstate Highways

 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Off-Road, Off-Trail)

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Slight	Acampo (85%)		8.4	42.4%
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Slight	Pentz (85%)		1.9	9.5%
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Slight	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Management

Water Management interpretations are tools for evaluating the potential of the soil in the application of various water management practices. Example interpretations include pond reservoir area, embankments, dikes, levees, and excavated ponds.

Embankments, Dikes, and Levees

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. The soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the suitability of the undisturbed soil for supporting the embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those

Custom Soil Resource Report

that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.


Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report Map—Embankments, Dikes, and Levees




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available


Soil Rating Lines

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available





Soil Rating Points

 Very limited
 Somewhat limited
 Not limited
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Tables—Embankments, Dikes, and Levees

Embankments, Dikes, and Levees— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available				7.4	37.3%
Subtotals for Soil Survey Area					7.4	37.3%
Totals for Area of Interest					19.7	100.0%

Embankments, Dikes, and Levees— Summary by Map Unit — San Joaquin County, California (CA077)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Very limited	Acampo (85%)	Piping (1.00)	8.4	42.4%
				Thin layer (0.19)		
				Dusty (0.02)		
151	Dumps, tailings	Not rated	Dumps (45%)		2.1	10.8%
			Tailings (45%)			
			Pits (5%)			
			Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Very limited	Pentz (85%)	Thin layer (1.00)	1.9	9.5%
				Piping (1.00)		
				Dusty (0.04)		
Subtotals for Soil Survey Area					12.4	62.7%
Totals for Area of Interest					19.7	100.0%

Embankments, Dikes, and Levees— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	10.2	51.9%
Null or Not Rated	9.5	48.1%
Totals for Area of Interest	19.7	100.0%

Rating Options—Embankments, Dikes, and Levees

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.


Custom Soil Resource Report
Map—K Factor, Whole Soil



Custom Soil Resource Report
















MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)










Soils

Soil Rating Polygons
















	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Lines








	.02
	.05
	.10
	.15
	.17
	.20

	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Points

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Water Features

	Streams and Canals
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
	Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Central Sierra Foothills Area, California,
Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil

K Factor, Whole Soil— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

K Factor, Whole Soil— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	.20	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	.32	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—K Factor, Whole Soil*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher*Layer Options (Horizon Aggregation Method):* Surface Layer (Not applicable)**Soil Physical Properties**

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this

Custom Soil Resource Report

attribute for the component. For this soil property, only the representative value is used.


The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


Soil Rating Polygons

 = 28.0000


 Not rated or not available


Soil Rating Lines

 = 28.0000


 Not rated or not available

Soil Rating Points

 = 28.0000

 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Saturated Hydraulic Conductivity (Ksat)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	28.0000	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	28.0000	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 60

Units of Measure: Centimeters

Linear Extensibility

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Custom Soil Resource Report


For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report Map—Linear Extensibility








MAP LEGEND

Area of Interest (AOI)






 Area of Interest (AOI)

Soils






Soil Rating Polygons

 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available

Soil Rating Lines

 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available

Soil Rating Points




 Low (0 - 3)
 Moderate (3 - 6)
 High (6 - 9)
 Very High (9 - 30)
 Not rated or not available

Water Features


 Streams and Canals

Transportation

 Rails
 Interstate Highways

 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Linear Extensibility

Linear Extensibility— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Linear Extensibility— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	1.5	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	1.5	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Linear Extensibility*Units of Measure:* percent*Aggregation Method:* Dominant Component*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher*Interpret Nulls as Zero:* No*Layer Options (Horizon Aggregation Method):* Depth Range (Weighted Average)*Top Depth:* 0*Bottom Depth:* 60*Units of Measure:* Centimeters**Soil Qualities and Features**

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.


If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group







MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
 Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
 Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Hydrologic Soil Group— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	A	8.4	42.4%
151	Dumps, tailings	A	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	D	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher**Drainage Class**


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

Custom Soil Resource Report Map—Drainage Class





















MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons


	Excessively drained		Excessively drained
	Somewhat excessively drained		Somewhat excessively drained
	Well drained		Well drained
	Moderately well drained		Moderately well drained
	Somewhat poorly drained		Somewhat poorly drained
	Poorly drained		Poorly drained
	Very poorly drained		Very poorly drained
	Subaqueous		Subaqueous
	Not rated or not available		Not rated or not available

Soil Rating Lines






	Excessively drained
	Somewhat excessively drained
	Well drained
	Moderately well drained
	Somewhat poorly drained
	Poorly drained
	Very poorly drained
	Subaqueous
	Not rated or not available

Soil Rating Points


Water Features

 Streams and Canals

Transportation

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Drainage Class

Drainage Class— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available		7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Drainage Class— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Moderately well drained	8.4	42.4%
151	Dumps, tailings		2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	Well drained	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Flooding Frequency Class

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

Custom Soil Resource Report

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

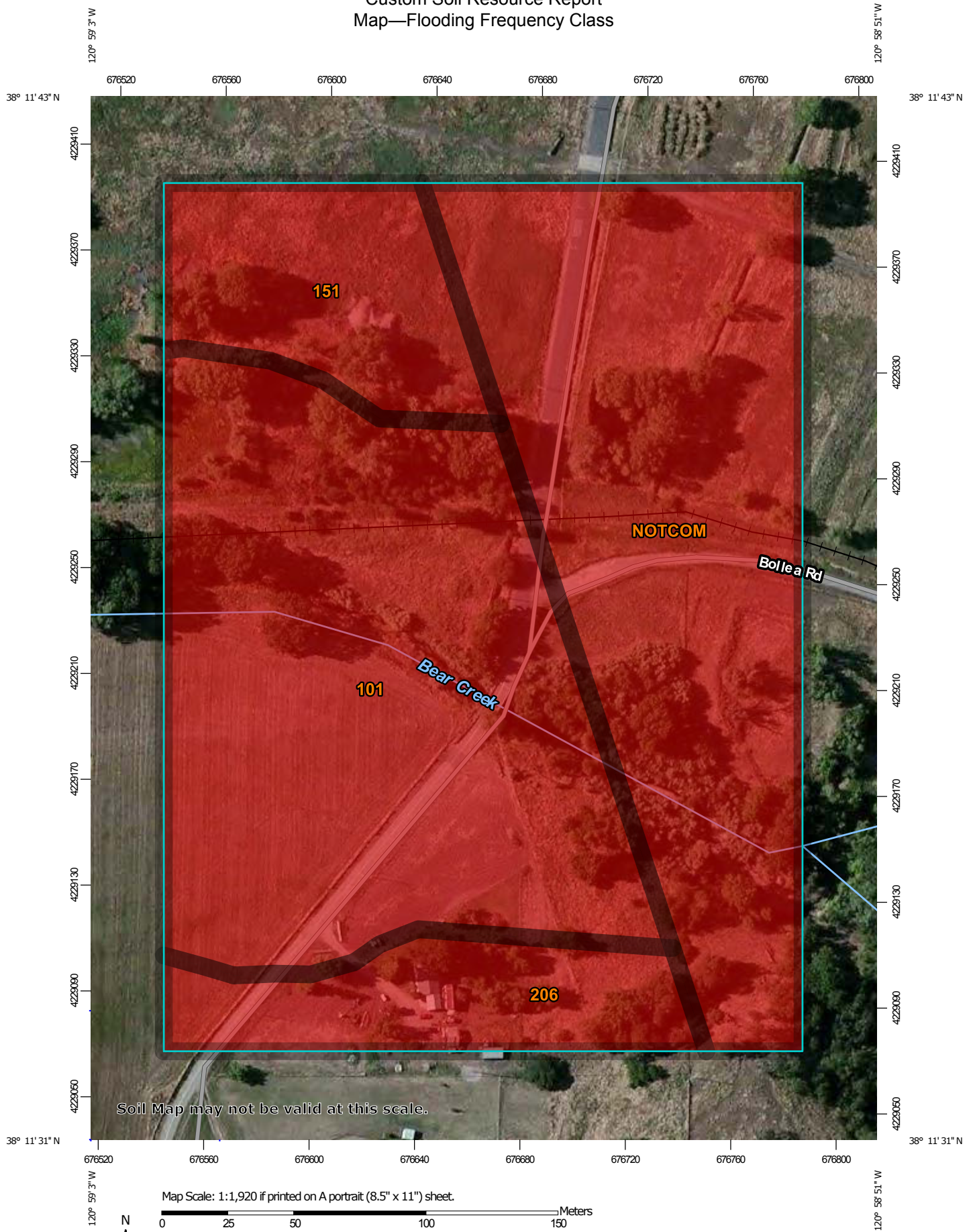
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report
Map—Flooding Frequency Class



Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.

0 25 50 100 150 Meters
0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84








MAP LEGEND

Area of Interest (AOI)








 Area of Interest (AOI)

Soils







Soil Rating Polygons


-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent
-  Not rated or not available

Soil Rating Lines

-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent
-  Not rated or not available

Soil Rating Points






-  None
-  Very Rare
-  Rare
-  Occasional
-  Frequent
-  Very Frequent

 Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Flooding Frequency Class

Flooding Frequency Class— Summary by Map Unit — Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties (CA630)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	None	7.4	37.3%
Subtotals for Soil Survey Area			7.4	37.3%
Totals for Area of Interest			19.7	100.0%

Flooding Frequency Class— Summary by Map Unit — San Joaquin County, California (CA077)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	None	8.4	42.4%
151	Dumps, tailings	None	2.1	10.8%
206	Pentz sandy loam, 2 to 15 percent slopes	None	1.9	9.5%
Subtotals for Soil Survey Area			12.4	62.7%
Totals for Area of Interest			19.7	100.0%

Rating Options—Flooding Frequency Class*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* More Frequent*Beginning Month:* January*Ending Month:* December

Ecological Site Assessment

Individual soil map unit components can be correlated to a particular ecological site. The Ecological Site Assessment section includes ecological site descriptions, plant growth curves, state and transition models, and selected National Plants database information.

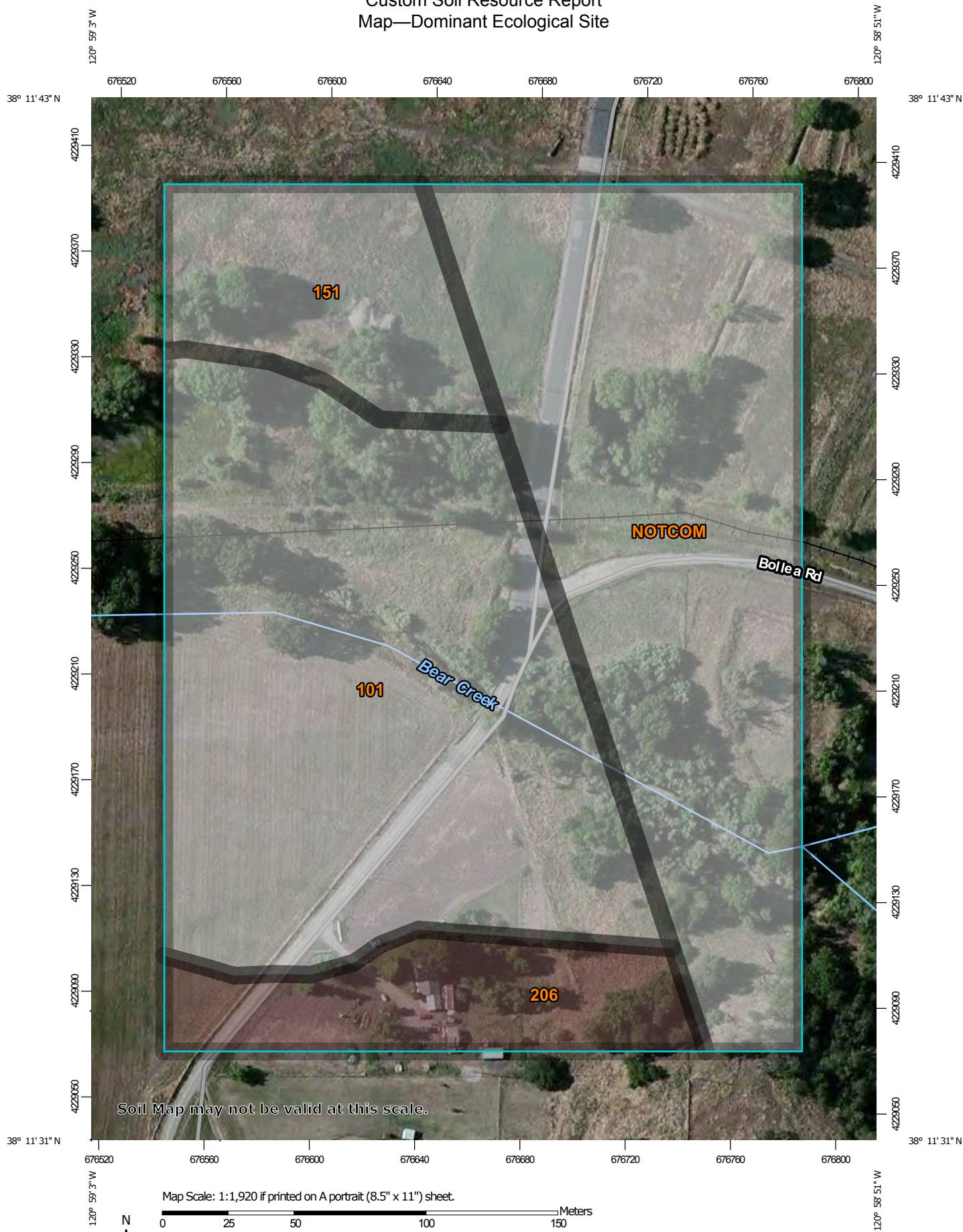
All Ecological Sites — Rangeland

An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site ID" is the symbol assigned to a particular ecological site.

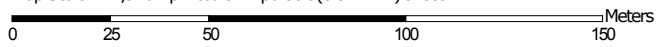
The map identifies the dominant ecological site for each map unit, aggregated by dominant condition. Other ecological sites may occur within each map unit. Each map unit typically consists of one or more components (soils and/or miscellaneous areas). Each soil component is associated with an ecological site. Miscellaneous areas, such as rock outcrop, sand dunes, and badlands, have little or no soil material and support little or no vegetation and therefore are not linked to an ecological site. The table below the map lists all of the ecological sites for each map unit component in your area of interest.

Custom Soil Resource Report
Map—Dominant Ecological Site



Soil Map may not be valid at this scale.


Map Scale: 1:1,920 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


Soil Rating Polygons

 R018XD076CA


 Not rated or not available


Soil Rating Lines

 R018XD076CA


 Not rated or not available

Soil Rating Points

 R018XD076CA

 Not rated or not available

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties
Survey Area Data: Version 1, Dec 9, 2013

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 10, Sep 28, 2016

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MAP LEGEND

MAP INFORMATION

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

Date(s) aerial images were photographed: May 12, 2010—Oct 30, 2011

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Table—Ecological Sites by Map Unit Component

Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties					
Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
NOTCOM	No Digital Data Available	NOTCOM (100%)		7.4	37.3%
Subtotals for Soil Survey Area				7.4	37.3%
Totals for Area of Interest				19.7	100.0%

San Joaquin County, California					
Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres in AOI	Percent of AOI
101	Acampo sandy loam, 0 to 2 percent slopes	Acampo (85%)		8.4	42.4%
		Tujunga (5%)			
		Devries (4%)			
		Unnamed, fine textured subsoil soils (4%)			
		Tokay (2%)			
151	Dumps, tailings	Dumps (45%)		2.1	10.8%
		Tailings (45%)			
		Pits (5%)			
		Xerofluvents (5%)			
206	Pentz sandy loam, 2 to 15 percent slopes	Pentz (85%)	R018XD076CA — SHALLOW LOAMY	1.9	9.5%
		Bellota (3%)			
		Alamo (2%)			
		Lithic Xerorthents (2%)			
		Pardee (2%)			
		Peters (2%)			
		Redding (2%)			
		Unnamed, deep mod fine texture soils (2%)			
Subtotals for Soil Survey Area				12.4	62.7%
Totals for Area of Interest				19.7	100.0%

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate

quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands

Prime and other Important Farmlands—Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties		
Map Symbol	Map Unit Name	Farmland Classification
NOTCOM	No Digital Data Available	

Prime and other Important Farmlands—San Joaquin County, California		
Map Symbol	Map Unit Name	Farmland Classification
101	Acampo sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated

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Prime and other Important Farmlands—San Joaquin County, California		
Map Symbol	Map Unit Name	Farmland Classification
151	Dumps, tailings	Not prime farmland
206	Pentz sandy loam, 2 to 15 percent slopes	Not prime farmland

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factors Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic surface layer. .

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed. Organic surface horizons are not displayed.

RUSLE2 Related Attributes—San Joaquin County, California								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
101—Acampo sandy loam, 0 to 2 percent slopes								
Acampo	85	—	A	.20	3	67.9	19.6	12.5
206—Pentz sandy loam, 2 to 15 percent slopes								
Pentz	85	—	D	.32	2	67.4	19.6	13.0

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on

observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

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Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				<i>Ft</i>	<i>Ft</i>		<i>Ft</i>				
NOTCOM—No Digital Data Available											
Notcom				—	—	—	—	—	—	—	

Map unit symbol and soil name	Hydrologic group	Surface runoff	Month	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				<i>Ft</i>	<i>Ft</i>		<i>Ft</i>				
101—Acampo sandy loam, 0 to 2 percent slopes											
Acampo	A	Very low	Jan-Dec	—	—	—	—	—	None	—	None
151—Dumps, tailings											
Dumps	A	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Tailings	A	Very high	Jan-Dec	—	—	—	—	—	None	—	None
206—Pentz sandy loam, 2 to 15 percent slopes											
Pentz	D	Low	Jan-Dec	—	—	—	—	—	None	—	None

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff—Central Sierra Foothills Area, California, Parts of Calaveras and Tuolumne Counties			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
NOTCOM—No Digital Data Available			
Notcom	100	—	—

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Hydrologic Soil Group and Surface Runoff—San Joaquin County, California			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
101—Acampo sandy loam, 0 to 2 percent slopes			
Acampo	85	Very low	A
151—Dumps, tailings			
Dumps	45	Very high	A
Tailings	45	Very high	A
206—Pentz sandy loam, 2 to 15 percent slopes			
Pentz	85	Low	D

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