Alameda Creek Bridge Replacement Project

ALAMEDA COUNTY, CALIFORNIA
DISTRICT 4 – ALA – 84, (PM 13.0/13.6)
Expenditure Authorization 04-16030/ Project #0400000429

Draft Environmental Impact Report

Prepared by the
State of California Department of Transportation

January 2015

General Information about This Document

What's in this document:
The California Department of Transportation (Caltrans) has prepared this Draft Environmental Impact Report (EIR), which examines the potential environmental impacts of the alternatives being considered for the proposed project located in Alameda County, California. Caltrans is the lead agency under the California Environmental Quality Act (CEQA). The document tells you why the project is being proposed, what alternatives we have considered for the project, how the existing environment could be affected by the project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:
- Please read this document.
- This document is available in electronic format at:
  http://www.dot.ca.gov/dist4/nilescanyon/
- Additional copies of this document and the related technical studies are available for review at:
  - Caltrans District 4, 111 Grand Avenue, Oakland, CA 94612
  - Niles Library, 150 I Street, Fremont, CA 94536
  - Fremont Main Library, 2400 Stevenson Boulevard, Fremont, CA 94538
  - Pleasanton Library, 400 Old Bernal Avenue, Pleasanton, CA 94566
- Attend the public meeting scheduled for:
  Monday, February 23, 2015 6:00 pm-8:00 pm
  Niles Elementary School
  37141 2nd Street
  Fremont, CA 94536
- We'd like to hear what you think. If you have any comments about the proposed project, please attend the public meeting and/or send your written comments to Caltrans by the deadline.
  - Send comments via postal mail to:
    Oliver Iberien, Environmental Branch Chief, Attention: Elizabeth White
    Department of Transportation, Office of Environmental Analysis
    111 Grand Avenue, MS 8B
    Oakland, CA 94612
  - Send comments via email to: nilescanyonprojects@dot.ca.gov.
- Be sure to send comments by the deadline: Friday, March 20, 2015.

What happens next:
After comments are received from the public and reviewing agencies, Caltrans may: (1) give environmental approval to the proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is obtained, Caltrans could design and construct all or part of the project.

General Information about This Document

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to California Department of Transportation, Attn: Elizabeth White, Office of Environmental Analysis, 111 Grand Avenue MS 8B, Oakland, CA 94612; (510) 286-6233 (Voice), or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

SCH #2010082001
DISTRICT 04-ALA-84 PM 13.0/13.6
EA 04-16030/Project #0400000429

This project proposes to replace the Alameda Creek Bridge on State Route 84. The project limits extend from postmile 13.0 to 13.6

DRAFT ENVIRONMENTAL IMPACT REPORT

Submitted Pursuant to: (State) Division 13, California Public Resources Code

THE STATE OF CALIFORNIA
Department of Transportation

1-30-15
Date of Approval

Bijan Sartipi, District Director
California Department of Transportation
CEQA Lead Agency

The following persons may be contacted for more information about this document:

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SUMMARY

Introduction

The California Department of Transportation (Caltrans) proposes to replace the Alameda Creek Bridge, along with realigning the eastern and western approaches to the bridge, on State Route 84 (SR-84) from postmile 13.0 to 13.6. The Alameda Creek Bridge has exceeded its useful service life and, at 87 years old, has exceeded the original 50-year design life of the structure, and retains many obsolete design features that do not meet modern standards. The bridge exhibits signs of structural deterioration with spalling concrete exposing the underlying reinforcing steel to the elements and to rusting. The purpose of the proposed project is to correct these deficiencies and improve traffic safety by replacing the existing bridge.

State Route 84 is a segmented state highway consisting of two sections. The first section is an east-west arterial road beginning at State Route 1 (SR-1) near San Gregorio in San Mateo County, running across the Dumbarton Bridge and ending at Interstate 580 (I-580) in Livermore. The second section of SR-84 is a north-south arterial that begins in Rio Vista, passes through Ryer Island, and ends at the Interstate-80 (I-80) interchange in West Sacramento. The Alameda Creek Bridge is located in the first section of SR-84, in southern Alameda County (refer to Figure S-1 for the project location map).

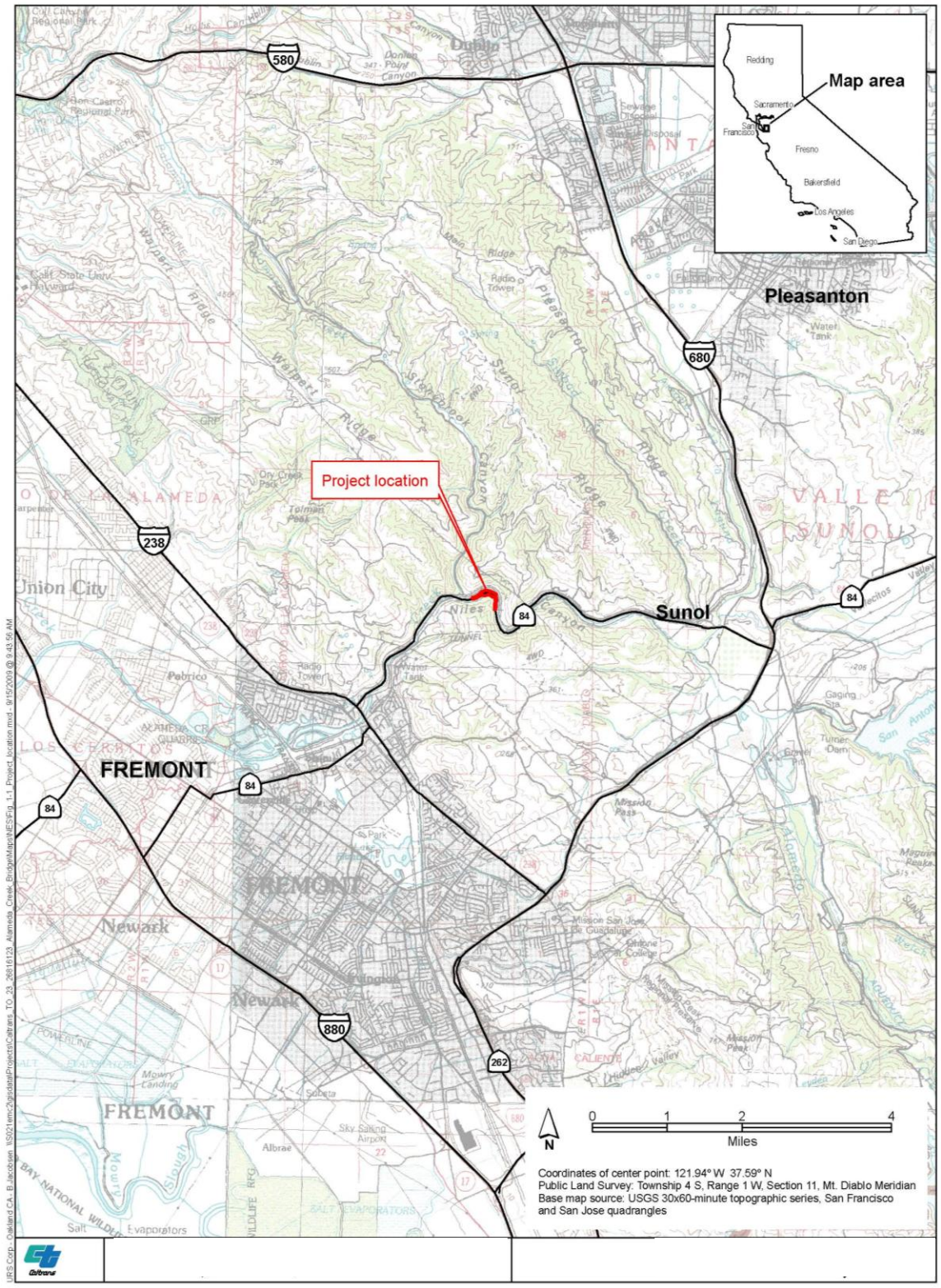
Caltrans is the lead agency responsible for preparing this draft Environmental Impact Report (EIR) in compliance with the California Environmental Quality Act (CEQA).

Overview of Project Area

The Alameda Creek Bridge is located in an undeveloped, scenic portion of SR-84, referred to as the Niles Canyon corridor. The Niles Canyon corridor is characterized as a two-lane conventional highway that leaves the urbanized setting of Fremont, CA and transitions into a rural setting east of Mission Boulevard (State Route 238 (SR-238)) and up to its connection with Interstate 680 (I-680). The roadway is generally bounded by a steep canyon wall, Alameda Creek, and the historic Niles Canyon Railway. The regulatory speed limit on the Niles Canyon section of SR-84 is 45 miles per hour (mph), which is reduced to an advisory speed of 30 mph at some curve locations. The roadway has narrow shoulders with generally curvilinear horizontal alignment; the eastern portion is less curvilinear with more open roadside and generally flatter sideslopes. In 2007, State Scenic Highway designation was awarded for the Niles Canyon and Paloma Way portion of SR-84 through the Niles Canyon corridor between SR-238 and I-680.

The Alameda Creek Bridge is located in the western portion of the Niles Canyon corridor. The historic Niles Canyon Railway parallels SR-84 and lies within 200 feet of the existing bridge. Similarly, the Sunol Aqueduct, a designated historic property, parallels SR-84 within the project limits. Remnant footings and in-stream concrete wall of a former bridge are located upstream of the existing Alameda Creek Bridge (refer to Figure 2 in Chapter 1). These bridge footings and concrete wall act as a weir and serve as a low-flow fish passage barrier. The land use surrounding the immediate project area is open space, predominately owned by public agencies and managed as watershed lands.

Figure S-1. Project Location Map



Projects in the Study Area

The only major action proposed in the immediate Alameda Creek Bridge Replacement Project vicinity is Caltrans' Niles Safety Improvements Project. The Niles Safety Improvements Project involves several localized safety improvements along SR-84, from Mission Boulevard (SR 238) to I-680. A list of projects considered as part of the Alameda Creek Bridge Replacement Project's cumulative impact analysis is located in Section 2.4.2.

Statement of Project Objectives and Purpose

This segment of SR-84 is identified in Caltrans's *State Route 84 Corridor System Management Plan* (Caltrans, 2010a) as a location at which traffic volumes are expected to grow, and for which operational and safety improvements are necessary in key areas to maintain the connectivity of the State Highway System.

Caltrans first identified the need to replace the Alameda Creek Bridge 17 years ago. Additionally, based on recommendations of a Federal Highway Administration (FHWA)'s Road Safety Analysis in 2012, the Alameda Creek Bridge was identified as a key safety improvement in the Niles Canyon corridor. In order to achieve the connectivity and safety goals of system planning, the deficiencies of the bridge should be addressed, which will also provide the safety benefits of a structure with modern geometry. Factors contributing to this assessment include the following facility deficiencies:

- Poor sight distances
- Low design speeds
- Bridge railings that do not offer the structural integrity of modern railing
- Bridge railings that do not provide the capability to redirect vehicles back into the roadway in the event of a collision
- Lack of width for bicycles to share the roadway
- Lack of width to allow for maneuvers to avoid collisions

Of the above deficiencies, the most crucial are the obsolete railing and lack of shoulders on the Alameda Creek Bridge. The current railing is not expected to withstand some foreseeable accident related impacts, and the lack of shoulders eliminates space needed by motorists maneuvering to avoid collisions.

Although the bridge is structurally adequate at the present time, it is currently classified as "functionally obsolete", meaning that it is no longer functionally adequate for its task due to the design deficiencies listed above. The Alameda Creek Bridge has exceeded its useful service life and, at 87 years old, has exceeded the original 50-year design life of the structure.

Accident analysis based on 1999 to 2012 traffic data shows a total of 12 collisions, six of which involved injuries, on the Alameda Creek Bridge. The collisions on the bridge included three cross-into-opposite-lane collisions, three head-on collisions, one instance of hitting the bridge approach guard railing, one instance of hitting the side of the bridge railing, and four hit-object collisions. Vehicles hitting the side of bridge railings and the

bridge approach guard railings constitute the hit-object type accidents. The actual fatality and injury rate of 1.13 within the bridge limits is more than double the state average rate (0.56) for similar facilities. In addition, the total accident rate (2.06) is significantly higher than the state average rate (1.31) for similar highway facilities. FHWA's Road Safety Analysis indicated that the number of accident rates at the Alameda Creek Bridge and eastern and western approaches are higher than they would be with a facility that meets current design standards.

Proposed Action

Caltrans proposes to replace the Alameda Creek Bridge, along with realigning the eastern and western approaches to bridge, on SR-84 from postmile 13.0 to 13.6. The Alameda Creek Bridge has exceeded its useful service life and, at 87 years old, has exceeded the original 50-year design life of the structure. The purpose of the proposed project is to correct these deficiencies and improve traffic safety by replacing the existing bridge. As discussed in Section 1.4.3, Alternatives Considered but Eliminated from Further Discussion, the existing bridge is not suitable for rehabilitation as the bridge does not have the structural capacity to carry the additional weight of widening to provide standard shoulders. The bridge additionally exhibits signs of structural deterioration with spalling concrete exposing the underlying reinforcing steel to the elements and to rusting.

This section describes the four Build Alternatives developed to meet the project objectives and purpose (refer to Appendix E for design plans of the Build Alternatives). Table S-1 identifies the differences between each of the Build Alternatives. The main difference between the four Build Alternatives is the design of the eastern segment of the Alameda Creek Bridge and eastern roadway approaches to the bridge. In addition to the four Build Alternatives, the No-Build Alternative is also considered.

Features Common to All Build Alternatives

All Build Alternatives would replace the existing Alameda Creek Bridge and construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. All Build Alternatives would realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. The larger radius of the curve would improve sight distance and reduce the number of errant vehicles that might otherwise cross the centerline or run off the roadway. The new alignments for both the western and eastern approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The roadway on the new alignment sections would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and a three-foot "choker" (also known as an unpaved three-foot shoulder). All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Additionally, all Build Alternatives propose to remove the existing Alameda Creek Bridge as well as remove the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge

footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal Endangered Species Act (ESA) consultation and the following permits: California Department of Fish and Wildlife (CDFW) 1602 Streambed Alteration Agreement and Clean Water Act (CWA) Section 404 and 401 permits. The removal of the weir is not considered mitigation for any level of CEQA significance, but is applied in the analysis in this document as a minimization measure where appropriate.

For visualizations of major project features, please see the visual simulations in Section 2.1.4 (Visual/Aesthetics).

Build Alternative 1

Build Alternative 1 would construct a new 410-foot long, 46-foot wide, cast-in-place (CIP) box girder bridge, with a 705-foot-radius curve, on the north side of the existing bridge. The new bridge will be supported by two on-land abutment foundations and two columns. One column will be placed in the stream and the other column will be located outside of the stream channel. The western alignment approach would be approximately 1,400-feet long and would require embankment fill for its entire length. Realignment of the eastern approach would require the installation of a 1,190-foot long steel-reinforced concrete retaining wall (Caltrans Type 1) and 1,090-foot long concrete soil-nail wall. The 1,190-foot long Type 1 retaining wall would be located on the creek side of SR-84 (called the WB wall). The Type 1 retaining wall would vary in height from a minimum of 13 feet to a maximum of 36 feet. The 1,090-foot long concrete soil-nail wall would be located on the hill side of SR-84 (called the EB wall) and would vary in height from a minimum of four feet to a maximum of 20 feet.

Build Alternative 2

Build Alternative 2 would construct a new 500-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, on the north side of the existing bridge. The new bridge will be supported by two on-land abutment foundations and three columns. Two columns will be constructed on either side of the primary creek channel and a third in the secondary channel, closer to the western approach. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length as well as the installation of an 850-foot-long Type 1 retaining wall, varying in height from four to 20 feet. Realignment of the eastern approach would require the installation of a 1,150-foot-long Type 1 retaining wall and a 470-foot long rock cut. The 1,150-foot-long Type 1 retaining wall would be located on the creek side of SR-84 (called the WB wall) and would vary in height from a minimum of 13 feet to a maximum of 36 feet. The 470-foot rock cut would be located on the hill side of SR-84 (called the EB wall) and would vary in height from a minimum of two feet to a maximum of 23 feet.

Build Alternative 3A

Build Alternative 3A would construct a new 450-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, on the north side of the existing bridge. The new

bridge would be supported by an abutment foundation at the west approach on a spread footing and three columns. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The new bridge would be comprised of two distinct sections. The first section would be a 450-foot long CIP box girder that crosses the flood channel. The second section would be a series of precast slabs installed as a sidehill viaduct for the eastern approach along 1,170 feet of the existing hillside. The bridge would be constructed as one continuous structure with no abutment or other structural feature between the box girder and precast slabs. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length. Realignment of the eastern approach requires the installation of approximately 800 feet of rock cuts with anchored-wire mesh and soil-nail walls on the hill side (called the EB wall). The combination of rock cuts and soil-nail walls would vary in height from a minimum of two feet to a maximum of twenty-one feet.

Build Alternative 3B

Build Alternative 3B would construct a new 450-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, north of the existing bridge. The new bridge would be supported by an abutment foundation at the west approach on a spread footing and three columns. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The new bridge would be comprised of two distinct sections. The first section would be a 450-foot long, CIP box girder that crosses the flood channel. The second section would be a series of precast slabs installed as a sidehill viaduct along 250 feet of the existing hillside. The bridge would be constructed as one continuous structure with no abutment or other structural feature between the sections; the two sections would abut at a paired-set of columns. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length. Realignment of the eastern approach would require the construction of a 300-foot-long rock cut with anchored-wire mesh on the hill side (called the EB wall). The rock cut would vary in height from a minimum of two feet to a maximum of 17 feet.

Table S-1. Summary of the Build Alternatives

Feature	Alternative 1	Alternative 2	Alternative 3A	Alternative 3B
New Bridge				
Total Length (feet)	410	500	450	450
Columns	2	3	3	3
Bridge Spans	3	4	4	4
Sidehill Viaduct				
Total Length (feet)			1,170	250
Spans			30	7
Western Approach				
Embankment fill (feet)	0 to 16.3	0 to 16.3	0 to 15.4	0 to 15.6
Slope				
Eastbound	4 to 1	4 to 1	4 to 1	4 to 1
Westbound	2 to 1	2 to 1	2 to 1	2 to 1
Roadway				
Total Length (feet)	1,400	1,400	1,400	1,400
Retaining Wall				
Type		Type 1		
Total Length (feet)		850		
Height (feet)		4 to 20		
Eastern Approach				
Roadway				
Total Length (feet)	1,200	1,200	1,100 (overlay only)	500 (overlay only)
WB Wall (Creek Side)				
Type	Type 1	Type 1		
Total Length (feet)	1,190	1,150		
Height (feet)	13 to 36	13 to 36		
EB Wall (Hill Side)				
Type	Soil-Nail Wall	Rock Cut	Soil-Nail Walls and Rock Cuts	Rock Cut
Total Length (feet)	1,090	470	800	300
Height (feet)	4 to 20	2 to 23	2 to 21	2 to 17

No-Build Alternative

Under the No-Build Alternative, the project would not be constructed. Operational deficiencies at the Alameda Creek Bridge would remain. The No-Build Alternative is considered the environmental baseline against which potential environmental impacts of the Build Alternatives are analyzed.

Project Impacts

Aesthetics/Visual

The Texas Bridge Railing (Texas C412) and ST-70 are proposed as the bridge railing options for all Build Alternatives. At this time, the Texas Bridge Railing is the preferred bridge railing option as this see-through bridge railing minimizes aesthetics/visual impacts while emulating the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives. Build Alternatives 2 and 3B would have a less-than-significant impact to aesthetic/visual resources. Various design features associated with Build Alternatives 1 and 3A would result in more substantial visual/aesthetic impacts than Build Alternatives 2 and 3B. Build Alternatives 1 and 3A have a potentially significant impact to aesthetics/visual resources. With the implementation of the following mitigation measures, Build Alternatives 1 and 3A would have a less-than-significant impact to aesthetics/visual resources and impacts associated with Build Alternatives 2 and 3B would be further reduced:

VISUAL-2. The following upslope retaining wall measures will be implemented:

- Minimize the overall height of walls to the greatest extent feasible. In general, from a visual perspective, downslope widening is preferable and has less impact than upslope widening. Downslope widening may, however, have other environmental effects and would require evaluation for feasibility in light of those effects.
- Use appropriate context-sensitive wall texture and/or color treatments on all upslope and downslope walls as identified in the visual impact assessment, to minimize contrast with the existing natural and historic settings. Concrete safety-shape barriers shall receive color stain to lower contrast with the walls and reduce glare. Surface texture treatments shall be developed in consultation with local agencies.
- Employ color staining of the concrete safety barrier of upslope retaining walls to reduce overall contrast between the walls and the barriers.
- Coordinate wall and concrete safety-shape barrier aesthetic treatments and carry consistent themes throughout the corridor.
- Where anchored or draped wire mesh slope protection is required:
- Wherever feasible, apply hydroseeded revegetation including locally native species to blend with the surrounding setting.
- Wire mesh shall be selected to match color and value of the underlying soil substrate to the greatest feasible extent in order to minimize visual contrast: For example, light-colored mesh over light-colored substrate; dark-colored mesh over dark substrate.

Agriculture/Forestry/Farmlands/Timberlands

The project would have no agriculture/forestry/farmlands/timberlands impacts.

Air Quality

This project is exempt from regional and project-level air quality conformity requirements under 40 Code of Federal Regulations (CFR) 93.126 as the project would reconstruct the Alameda Creek Bridge with no additional travel lane/lanes. The proposed bridge replacement will not create or alter roadway intersections where localized hot-spots are mostly likely to occur. The proposed project would not cause exceedances or new violations of the National or California Ambient Air Quality Standards.

The proposed project would generate air pollutants during the construction period, which is expected to last a total of three years. The impacts from trucks and construction equipment emissions are considered temporary. There are no sensitive receptors close enough to the project to be affected by these emissions. No potentially adverse air quality emission impacts are associated with the project. The Alameda Creek Bridge Replacement Project would have negligible air quality impacts.

Biological Resources

Natural Communities: The Alameda Creek Bridge Replacement Project would impact natural communities located within the project limits. All Build Alternatives would result in the removal of trees in the project area; Build Alternative 3B would result in the least amount of tree removal (approximately 284 trees) while Build Alternative 1 would result in the greatest amount of trees removed (approximately 415 trees). As a result, all Build Alternatives have a potentially significant impact on riparian and coastal oak woodland communities. Aspects of the Alameda Creek project, including restoring temporarily impacted construction areas, removing the existing Alameda Creek Bridge, and reclaiming the existing SR-84 roadway would lessen project impacts on natural communities. However, with the implementation of the following mitigation measure, all Build Alternatives would have a less-than-significant impact to natural communities:

TREES-1. Caltrans will provide tree replacement on-site at a minimum 1:1 ratio in the existing SR-84 alignment for upland trees. Depending on the Build Alternative selected and the number of upland trees able to be planted on-site, there may be a need for off-site mitigation planting (at a location to be determined). Mitigation for trees removed from the riparian zone will be mitigated at a 3:1 ratio and will be replanted within the Alameda Creek watershed, with as many riparian mitigation trees planted on-site as possible. Depending on the Build Alternative selected and the number of riparian trees able to be planted on-site, there may be a need for off-site mitigation planting. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements.

Wetlands and Other Waters: The project would result in minimal wetland loss and some loss of area within the Ordinary High Water Mark of Alameda Creek. All temporarily impacted wetlands and other waters would be restored and revegetated when the project is complete. The Alameda Creek Bridge Replacement Project would remove the existing bridge (including in-stream

columns) and removal of the invasive giant reed populations within the project area. The removal of the in-stream columns would help Alameda Creek return to a more natural morphology. All Build Alternatives would have a less-than-significant impact to wetlands and other waters. Impacts to wetlands and other water would be further reduced by removing the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier; removal of these bridge footings and concrete wall would help Alameda Creek return to a more natural morphology. The removal of these bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

Plant Species: Plant surveys indicate there is low potential for rare plants to be in the study limits. All Build Alternatives would have a less-than-significant impact to plant species.

Animal Species: The project would impact habitat suitable for several species that have special status with the regulatory agencies, but are not listed as threatened or endangered. These species include river lamprey and pacific lamprey, western pond turtle, San Francisco dusky-footed woodrat, and migratory birds (Cooper's hawk, White-tailed kite, yellow warbler, heron and egret rookeries including great blue heron, great egret, snowy egret, and black-crowned night heron). Impacts to these species as a result of the proposed project construction activities would not affect local populations through the implementation of project avoidance and minimization measures, identified in Section 2.3.7 as part of the project design. Project impacts to the animal species listed above would be less than significant. Additionally, long-term habitat impacts on many of these species' from the Alameda Creek Bridge Replacement Project would be further reduced through the on-site restoration of the abandoned SR-84 alignment and removing the remnants of the existing bridge footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier; removal of these bridge footings would help Alameda Creek return to a more natural morphology. The removal of these bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project as partial compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

The Alameda Creek Bridge Replacement Project would result in the loss of day and night roosting habitat for bats, which is considered a potentially significant impact. To mitigate for the potentially significant impact to roosting bats, measures were developed to provide similar on-site habitat in the design of the

new Alameda Creek Bridge. All Build Alternatives would have a less-than-significant impact to roosting bats with the implementation of the following mitigation measure:

BATS-1. To mitigate for the loss of day and night roosting habitat from the removal of the existing bridge, Caltrans will incorporate constructed daytime crevice roosts and recessed night roosts out of concrete into the underside of the new bridge structure.

Threatened and Endangered Species:
The project would impact three threatened and endangered species: the California red-legged frog (CRLF), Alameda whipsnake (AWS), and Central California Coast Distinct Population Segment (DPS) of steelhead.

- CRLF: No effects to CRLF breeding habitat are anticipated as there is no suitable breeding habitat within the project limits; however direct effects to individual CRLFs in the project area may occur as a result of construction activities. Work in Alameda Creek will be conducted during the dry season, when adult CRLF are not expected to be dispersing through the project area. Efforts to further minimize direct effects to individual CRLFs during construction activities will occur with the implementation of project avoidance and minimization measures. Long-term impacts on CRLF habitat are expected to be beneficial as the Alameda Creek Bridge Replacement Project would remove the existing bridge (including in-stream columns) and remove invasive giant reed populations within the project area. As a result, all Build Alternatives would have a less-than-significant impact to individual CRLFs and CRLF habitat. Additionally, CRLF habitat would benefit from removing the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project to serve as partial compensatory-mitigation to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

- AWS: All Build Alternatives would result in minor disturbance to AWS Critical Habitat Unit 3. The Alameda Creek Bridge Replacement Project's impact to AWS could be considered potentially significant as project construction activities could result in injury or death of AWS. Avoidance and minimization measures are proposed as a method by which to limit, to the greatest extent practicable, the potential for the project to result in direct take of AWS. Mitigation for temporary and permanent impacts to habitat for AWS will be accomplished through a combination of on-site restoration and enhancement and preservation of suitable habitat off-site

through purchase of credits at an approved conservation bank. On-site mitigation efforts include the restoration of temporarily impacted construction areas, on-site restoration and enhancement of the existing SR-84 roadway, and removal of the existing Alameda Creek Bridge. Restoring suitable habitat in the project area and conserving habitat off-site will reduce impacts to local AWS populations. Absent mitigation measures, all Build Alternatives would have a significant impact on AWS, however with the implementation of the following mitigation measure, all Build Alternatives would have a less-than-significant impact to AWS:

AWS-1. Compensation for the minor disturbance to AWS Critical Habitat Unit 3 for AWS will occur through on-site restoration of temporarily impacted areas (at a 1:1 ratio), on-site restoration and enhancement of the existing SR-84 roadway and through compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. A portion of the proposed compensation for permanent impacts will be covered by the on-site restoration of the current bridge columns and roadway approaches.

- Steelhead: The installation of the bridge columns for all Build Alternatives would result in permanent impacts to riverine or emergent wetland habitat along the banks of Alameda Creek. The footprint of the new piers would be smaller than the existing pier walls, resulting in a reduction of hard structure within Alameda Creek. Efforts to further minimize direct effects to individual steelhead during construction activities will occur with the implementation of project avoidance and minimization measures. Long-term impacts on steelhead habitat associated with the project are expected to be beneficial as implementing the project would result in a reduction of hard structure in the creek channel and the removal of invasive giant reed populations. All Build Alternatives would have a less-than-significant impact on steelhead. Additionally, long-term impacts on steelhead habitat would benefit from removing the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project to serve as partial compensatory mitigation to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation.

Invasive Species

The project proposes to remove the invasive giant reed populations (*Arundo donax*) located in the project vicinity. Caltrans Standard Specifications will control the spread or introduction of invasive species in the project vicinity (Caltrans, 2010b). No impact associated with invasive species is anticipated as a result of the project.

Community Impacts

The project would have no community impacts.

Climate Change/Greenhouse Gas Emissions

The project would increase greenhouse gas emissions temporarily during the construction of the project. Although construction emissions are unavoidable and are expected to be minimal, the proposed project would not increase capacity of the State Highway System and is not expected to result in additional operational carbon dioxide (CO_2) emissions. However, it is Caltrans' determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change.

Cultural Resources

The Alameda Creek Bridge has been determined not eligible for the federal National Register of Historic Places nor does it meet the criteria under PRC 5020.1 for the California Register of Historic Resources. However, Alameda County identified the bridge as a local resource that is potentially eligible for inclusion on the Alameda County Register. Due to this designation as a potentially historic resource, Caltrans is treating it to be a historical resource under CEQA and the demolition of the Alameda Creek Bridge is considered to be a significant environmental impact.

Energy

Energy use would temporarily increase during the construction of the project. All Build Alternatives would have a less-than-significant impact on energy usage.

Geology/Soils/Seismic/Topography

All Build Alternatives are designed using Caltrans' Seismic Design Criteria (SDC), which provides minimum seismic requirements for highway bridges designed in California. Water quality measures that protect soils and prevent soil erosion would be implemented as part of the project. All Build Alternatives would have a less-than-significant impact to geology/soils/seismic/topographic resources.

Growth/Population/Housing

Land use in the Niles Canyon corridor is protected by the City of Fremont's Area Hill Initiative and Alameda County's Save Agriculture and Open Space Lands Initiative; both initiatives aim to preserve and enhance open space in Alameda County by limiting development. Land use is further protected by the fact that public agencies own and operate the area surrounding the project vicinity as watershed lands. No impacts to

growth/population/housing are anticipated as there are no populations or proposed housing developments in the project vicinity nor are any anticipated in the near future. The proposed project will maintain the existing two lane capacity and maintain the existing 45 mph regulatory speed limit of this section of SR-84. All Build Alternatives would have no impact to growth/population/housing.

Hazardous Waste/Materials

The project would generate hazardous waste/materials, including lead based paint and asbestos containing material, during the demolition of the existing Alameda Creek Bridge. The removal and disposal of hazardous waste/materials would be conducted in accordance with all federal and state rules and regulations. All Build Alternatives would have a less-than-significant impact to hazardous waste/materials.

Hydrology and Floodplains

No adverse impacts on natural and beneficial floodplain values are anticipated from the Alameda Creek Bridge Replacement Project. The hydraulics of Alameda Creek would be altered with the removal of the former bridge footings and concrete wall (concrete weir) located upstream of the existing Alameda Creek Bridge. The removal of the weir is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA 404 and 401 permits. The removal of the weir would enhance floodplain values from existing conditions by ensuring full fish passage through the project site, restoring the Alameda Creek to a more natural condition, and eliminating the backwater effect created by the weir. Approximately 1,500 cubic feet of sediment, currently impounded by the weir, would be transported naturally downstream. The release of the impounded sediment could constitute a significant impact on Alameda Creek. However, with the implementation of the following mitigation measures designed to minimize sediment impact on Alameda Creek, all Build Alternatives would have a less-than-significant impact to Alameda Creek hydrology and floodplains:

HYDROLOGY-1. Temporary Sediment Retention and Release: Implement temporary structure (such as plywood cofferdam or a weir constructed with large cobbles) to retain the impounded sediment. The structure will be designed to withstand low to medium flows that would minimally disperse the impounded sediment and potentially cause nuisance sediment deposits that could impede passage by fish and other aquatic organisms. The temporary structure would be designed to wash out (large cobbles) or be removed (plywood cofferdam) prior to a high flow event, allowing the high flow to disperse the sediment more evenly to downstream reaches.

HYDROLOGY-2. Staged Weir Removal: This measure consists of the gradual removal of the weir to minimize potential nuisance sediment deposits in downstream reaches. Portions of the weir would be selected for lowering or removal at any one time; the weir would be removed over the course of several years. This option allows the existing weir to moderate sediment dispersion and eliminates the need to construct a temporary structure.

HYDROLOGY-3. Draw Down Rate: Weir removal should accommodate the release of impounded water at a slow rate, taking place over the course of several days to minimize the risk of supersaturation and take of listed species. In addition, this measure would reduce bank erosion associated with a pulse of water greater than the normal natural variation.

HYDROLOGY-4. Vegetative Stabilization: After the weir is removed and the water level drops, this measure would strategically plant vegetation species with vigorous growth habits to stabilize some of the sediment in place. Emergent vegetation species, such as cattail and bulrush, would be planted along the margin of the low flow channel, and riparian species, including willow, mulefat, California blackberry, and tall flatsedge, would be planted in the overbank areas. The intent of the vegetation would not be to permanently stabilize the sediment, as high flow conditions are likely to uproot new plantings and wash them downstream. Rather, the vegetation would be a temporary measure to mitigate the magnitude of the sediment pulse to downstream reaches. It is estimated that it would take approximately two to five years for the vegetation to have a stabilizing effect, so the performance of this option is uncertain.

Land Use/Planning

The project requires the acquisition of permanent right of way from Alameda County, the San Francisco Water Department (SFWD), Alameda County Water District (ACWD), and the San Francisco Public Utilities Commission (SFPUC). The land use designation for the newly aligned portion of SR-84 (approximately 132,000 square feet) would from "Open Space" to "Transportation". All Build Alternatives would have a less-than-significant impact for land use/planning as all Build Alternatives require a change in land use designation from open space to transportation.

Mineral Resources

The project would have no impacts to mineral resources.

Noise

The Alameda Creek Bridge Replacement Project would not add through-traffic lane and will not cause substantial horizontal or vertical alterations. Therefore, it is not a Type I project as defined in 23 CFR 772. The Alameda Creek Bridge Replacement Project would not increase the capacity of SR-84, but would increase the sight distance and maintain the existing regulatory 45 mph speed limit of SR-84. The increase in noise levels associated with maintaining the regulatory 45 mph speed limit on 0.6 miles of SR-84 is anticipated to be negligible. Noise levels would increase during the construction of the new Alameda Creek Bridge; however, no noise impacts would occur since the project is located in a remote area of Niles Canyon with no noise sensitive users in the project vicinity. Operational impacts of all Build Alternatives are negligible and would have no noise impact. Noise impacts related to biological resources are addressed in Section 2.3 Biological Environment.

Paleontology

The proposed project involves ground-disturbing activities in an area with geologic units with potentially high sensitivity for producing paleontological resources and as result, the proposed project could have the potential to significantly impact paleontological resources. A Paleontological Mitigation Plan (PMP), defining specific mitigation measures and methods, would be prepared and implemented before construction in order to address any paleontological resources that may be discovered in the project vicinity. All Build Alternatives would have a less-than-significant impact to paleontological resources with implementation of the following mitigation measure:

PALEONTOLOGY-1: A PMP defining specific mitigation measures and methods, will be prepared and implemented before construction begins. The PMP may include:

- The presence of the Principal Paleontologist at pre-construction meetings to consult with the construction contractor.
- Paleontological awareness training for construction workers to be provided for by the Principal Paleontologist.
- Monitoring of ground disturbing activities such as excavation by the paleontological monitors, to be conducted under the supervision and/or at the direction of the Principal Paleontologist.
- Temporary halting or diversion of construction activities in areas where fossils are discovered.
- Preparation, sorting, and cataloging of fossils collected during the monitoring and salvage. Fossils are prepared to the point of identification, not display.
- Curation of fossils, along with copies of all pertinent field notes, photos, and maps at a curation facility acceptable to Caltrans.
- Preparation of the Paleontological Mitigation Report to document the results of the mitigation program.

Parks and Recreational Facilities

There would be no direct or long-term impacts to the only existing park and recreational facility within 0.5 miles of the Alameda Creek Bridge Replacement Project, the Niles Canyon Railway. During construction activities, noise levels would temporarily increase and railway passengers would experience minor and temporary aesthetics/visual impacts while passing the project vicinity.

Within the vicinity of the Alameda Creek Bridge Replacement Project, the East Bay Regional Parks District (EBRPD) is currently conducting a feasibility study for a Class 1 bicycle trail through the Niles Canyon corridor. Caltrans is participating in the multi-agency Niles Canyon bicycle trail development team to help coordinate and synchronize project development efforts in Niles Canyon. While the design path of the trail has not been finalized, a safer crossing of Alameda Creek for cyclists and pedestrians would be provided by this project and could be incorporated into the design of the Niles Canyon Class 1 bicycle trail.

There would be less-than-significant impacts to parks and recreational facilities within 0.5 miles of the Alameda Creek Bridge Replacement Project.

Public Services
For the construction of all Build Alternatives, the roadway would be temporarily shifted towards the cut slope. Short-term lane closures would be necessary to facilitate construction. These short-term lane closures would occur on the weekends and during off-peak hours as to not affect peak-hour traffic (between 6 am – 10 am and 3 pm – 7 pm) during the weekdays. Fire protection and police services may be temporarily impacted by these short-term lane closures during the construction of the new Alameda Creek Bridge, but would result in a less-than-significant impact to public services.

Traffic and Transportation/Pedestrian and Bicycle Facilities
All Build Alternatives would improve sight distance, provide standard eight-foot shoulders, and bridge railing that meets standard bridge rail design on a 0.6 mile segment of SR-84. The existing bridge currently has a 45 mph regulatory speed limit with advisory signage recommending that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound. Construction of the proposed project would result in the removal of the advisory signage. The proposed project has no impact to traffic safety as the all Build Alternatives are designed to maintain the 45 mph regulatory speed limit of this section of SR-84. For the construction of all Build Alternatives, the roadway would be temporarily shifted towards the cut slope. Short-term lane closures would be necessary to facilitate construction. These short-term lane closures would occur on the weekends and during off-peak hours as to not affect peak-hour traffic (between 6 am – 10 am and 3 pm – 7 pm) during the weekdays.

The proposed project would require staged construction plans, construction area sign plans, and a Traffic Management Plan (TMP) during construction activities. The proposed project would have no impact to pedestrian facilities. The project would provide a standard eight-foot shoulder on a bridge that does not currently provide any shoulder or refuge for cyclists. All Build Alternatives would have a less-than-significant impact on traffic and transportation/pedestrian and bicycle facilities during the construction of the Alameda Creek Bridge Replacement Project and no permanent impact on traffic and transportation/pedestrian and bicycle facilities.

Utilities/Emergency Services
Two Pacific Gas & Electric (PG&E) utility poles would be relocated as a result of the project. AT&T also uses these poles to provide telecommunication service through the area. No temporary or long-term impacts to electricity or telecommunications services would occur as a result of the relocation. All Build Alternatives would have a less-than-significant impact to utilities and emergency services.

Water Quality and Storm Water Runoff
A creek diversion of Alameda Creek is proposed from June 1 to October 15 to ensure water quality is protected during bridge construction and demolition activities along with standard Caltrans Best Management Practices for water quality. All Build Alternatives would result in an increase in paved surface within the project area. The project's stormwater treatment system would address water treatment and ensure pollutants are removed from stormwater runoff on the newly aligned portion. The proposed removal of

the old bridge footings (weir) located upstream of the existing Alameda Creek Bridge would result in some sediment dispersal through Alameda Creek. Approximately 1,500 cubic feet of sediment, currently impounded by the weir, would be transported naturally downstream. The release of the impounded sediment could constitute a significant impact on Alameda Creek's water quality. However, mitigation measures designed to minimize sediment impact on Alameda Creek would ensure a less-than-significant impact on water quality. All Build Alternatives for the Alameda Creek Bridge Replacement Project would temporarily impact water quality, however, impacts to water quality are less than significant with the implementation of the mitigation measures identified in *Hydrology and Floodplains*.

Cumulative Impacts

The Alameda Creek Bridge Replacement Project has potentially significant impacts that are potentially cumulatively considerable for the following resource area:

- Cultural Resources *(As noted above, the Alameda Creek Bridge has been determined not eligible for the National Register of Historic Places (federal) nor does it meet the criteria under PRC 5020.1 for the California Register of Historic Resources (state). However, Alameda County identified the bridge as a local resource that is potentially eligible for inclusion on the Alameda County Register. Due to this designation as a potentially historic resource, Caltrans is treating it to be a historical resource under CEQA and the demolition of the Alameda Creek Bridge is considered to be a significant environmental impact.)*

The Alameda Creek Bridge Replacement Project has potentially significant impacts, but are not potentially cumulatively considerable for the following resource areas:

- Aesthetics/Visual
- Water Quality and Stormwater Runoff
- Wetlands and Other Waters
- Natural Communities (trees)
- California Red-legged Frog
- Alameda Whipsnake
- Roosting Bats

The Alameda Creek Bridge Replacement Project would contribute to cumulative impacts for the following resource area, however, these contributions are beneficial:

- Steelhead – Central California Coast DPS

Coordination with Public and Other Agencies

Permits and Approvals Needed

The following permits, reviews, and approvals identified in Table S-2 are required for project construction.

Table S-2. Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species and review and comment on CWA 404 Permit.	Consultation to occur prior to final environmental document.
United States Army Corps of Engineers (USACE)	CWA Section 404 permit for filling or dredging waters of the United States.	CWA Section 404 Two nationwide permits would be obtained for the proposed project. The first permit will be acquired for the geotechnical borings and the second permit will be acquired prior to the construction of the Alameda Creek Bridge.
California Department of Fish and Wildlife (CDFW)	1602 Agreement for Streambed Alteration Incidental Take Permit for Threatened and Endangered Species	Incidental Take Permit and 1602 Agreement would be acquired prior to the geotechnical borings.
Regional Water Quality Control Board (RWQCB)	CWA Section 401	CWA Section 401 Water Certifications would be obtained prior to the CWA 404 nationwide permits.
National Marine Fisheries Service (NMFS)	Section 7 Consultation for Threatened and Endangered Species	Consultation to occur prior to final environmental document.

Scoping Process

Caltrans began the formal environmental review process for this project in February 2014. Two scoping meetings were held. The first meeting was held in Sunol at the Glenn Elementary School, located at 11601 Main Street, on Tuesday, February 25, 2014 from 7 pm – 9 pm. The second meeting was held in Fremont at the Niles Elementary School, located at 37141 Second Street, on Tuesday, March 4, 2014 from 7 pm – 9 pm. Informational boards and access to project personnel were provided at both meetings. A change in meeting format was requested by members of the public at the first scoping meeting. The second meeting at the Niles Elementary School included a project presentation given by the Caltrans Project Manager, Jack Siauw, followed by a formal question-and-answer session with a panel of project personnel.

External Agency Coordination

The following provides a summary of agency consultation and professional contacts in advance of the draft Environmental Document's release:

- March 6, 2014 – A technical assistance meeting was held in the field with Joe Heublein (NMFS) to discuss the project and the potential removal of the concrete weir upstream of the current bridge.
- March 26, 2014 – A technical assistance meeting was held in the field with Melissa Escaron (CDFW) and John Cleckler (USFWS) to describe the proposed project.
- June 4, 2014 – A meeting was held at Caltrans District 4 Office to discuss the proposed project. Attendees included John Cleckler, Melissa Escaron and Marcia Grefsrud (CDFW), Holly Costa (USACE), Derek Beauduy (RWQCB), and Joe Heublein (NMFS). Discussion on the potential occurrence of California tiger salamander (CTS) occurred. Staff from USFWS and CDFW concluded that CTS would not likely be present in the proposed project vicinity and that mitigation would not be required. Caltrans' proposed mitigation strategy also was discussed with agencies.
- June 24, 2014 – A meeting was held at Caltrans District Offices to discuss the proposed project with Jeff Miller (Director, Alameda Creek Alliance).
- July 28, 2014 – A technical assistance meeting was held in the field with Holly Costa (USACE), Derek Beauduy (RWQCB), John Cleckler (USFWS) and three representatives from Alameda Creek Alliance.

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List of Abbreviated Terms

AADT	Average Annual Daily Traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACFCD	Alameda County Flood Control and Water Conservation District
ACM	asbestos-containing material
ACRCD	Alameda County Resource Conservation District
ACWD	Alameda County Water District
ADL	aerially deposited lead
APE	Area of Potential Effect
ARB	Air Resources Board
ASR	Archeological Study Report
AT&T	American Telephone and Telegraph Company
AWS	Alameda whipsnake
BAAQMD	Bay Area Air Quality Management District
BAHM	Bay Area Hydrology Model
BART	Bay Area Rapid Transit
BAT	best available technology
BDPL	Bay Development Pipeline
BFE	base flood elevation
BMP	best management practices
BO	Biological Opinion
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CIDH	cast-in-drilled-hole
CIP	cast-in-place
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO-CAT	Coastal Ocean Climate Action Team
CO	Carbon monoxide
CO_2	Carbon dioxide

CHBC	California Historical Building Code
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CTP	California Transportation Plan
CTS	California tiger salamander
CWTP	Alameda Countywide Transportation Plan
CWA	Clean Water Act
DNA	dioxyribonucleic acid
DPS	Distinct Population Segment
DSA	disturbed soil area
EACCS	East Alameda County Conservation Strategy
EB	eastbound
EBRPD	East Bay Regional Parks District
ECAP	East County Area Plan
EIR	Environmental Impact Report
EO	Executive Order
ESA	environmentally sensitive area
FGC	California Fish and Game Code
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRMS	Federal Insurance Rate Maps
GHG	green-house gas
HM	hydromodification
HOV	high-occupancy vehicle
HPSR	Historic Property Survey Report
HRER	Historic Resources Evaluation Report
HAS	Hydrologic Sub-Area
H&SC	Health and Safety Code
I-580	Interstate 580
I-680	Interstate 680
I-80	Interstate 80
IGR	intergovernmental review
IPCC	Intergovernmental Panel on Climate Change
ITP	Incidental Take Permit
ITS	Intelligent Transportation System
KVP	key view point
LBP	lead based paint
LEDPA	Least Environmentally Damaging Practicable Alternative
LOTB	log of test borings

MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MOU	Memorandum of Understanding
MTC	Metropolitan Transportation Plan
RTP	Regional Transportation Plan
MMT	million metric tons
mph	miles per hour
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer Systems
NAHC	Native American Heritage Commission
N_2O	nitrous oxide
NCTR	Niles Canyon Transcontinental Railroad
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Act
OSTP	Office of Science and Technology Policy
PA	Programmatic Agreement
PCE	primary constituent elements
PDT	project development team
PG&E	Pacific Gas & Electric
PIR	Paleontological Identification Report
PLA	Pacific Locomotive Association
$PM_{2.5}$	Particulate matter less than 2.5 micrometers in diameter
PM_{10}	Particular matter less than 10 micrometers in diameter
PMP	Paleontological Mitigation Plan
PRC	Public Resources Code
QRSA	Quantitative Road Safety Analysis
RCRA	Resource Conservation and Recovery Act
ROW	right of way
RSA	Resource Study Area
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCS	Sustainable Communities Strategy

SDC	Seismic Design Criteria
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Department
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SHOPP	State Highway Operation and Protection Program
SR	State Route
SR-238	State Route 238 / Mission Boulevard
SR-84	State Route 84
Sta.	station
SVWC	Spring Valley Water Company
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCE	temporary construction easement
Texas C412	Texas Bridge Railing
TMDLs	total maximum daily loads
TMP	Traffic Management Plan
TSCA	Toxic Substances Control Act
U.S. EPA	United States Environmental Protection Agency
UCMP	University of California Museum of Paleontology
USACE	United States Army Corp of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VIA	Visual Impact Assessment
WB	westbound
WDRs	Waste Discharge Requirements
WPCP	Water Pollution Control Plan

Chapter 1—Proposed Project

1.1 Introduction

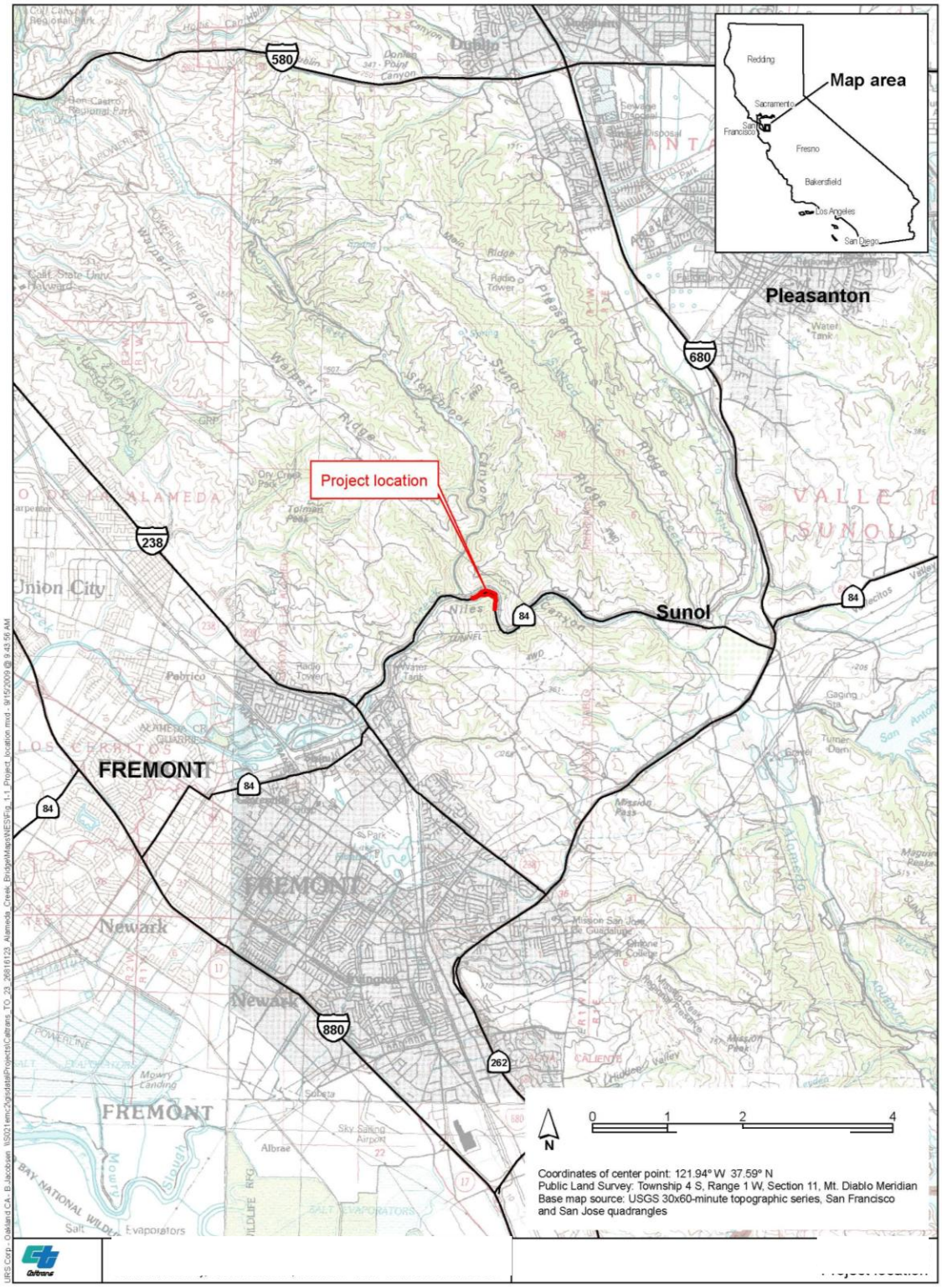
The California Department of Transportation (Caltrans) proposes to replace the Alameda Creek Bridge, along with realigning the eastern and western approaches to the bridge, on State Route 84 (SR-84) from postmile 13.0 to 13.6. California SR-84 is a segmented state highway consisting of two sections. The first section is an east-west arterial road beginning at San Gregorio in San Mateo County, running across the Dumbarton Bridge and ending at Interstate 580 (I-580) in Livermore. The second section of SR-84 is a north-south arterial that begins in Rio Vista, passes through Ryer Island, and ends at the Interstate-80 (I-80) interchange in West Sacramento. The Alameda Creek Bridge is located in the first section of SR-84, in southern Alameda County. Caltrans is proposing to replace the existing 1928, two-lane bridge with a new, two-lane structure with standard eight-foot wide shoulders, just north of the existing bridge (refer to Figure 1. Project Map). The Alameda Creek Bridge is located in a scenic part of SR-84, known as Niles Canyon. This stretch of SR-84, from the City of Fremont to the town of Sunol, is considered part of the State's Scenic Highway System.

Caltrans is the lead agency responsible for preparing this draft Environmental Impact Report (EIR) in compliance with the California Environmental Quality Act (CEQA).

Caltrans first identified the need to replace the Alameda Creek Bridge 17 years ago. Additionally, based on recommendations of a Federal Highway Administration (FHWA)'s Road Safety Analysis in 2012, the Alameda Creek Bridge was identified a key safety improvement in the Niles Canyon corridor. Caltrans sponsored the Road Safety Analysis and Quantitative Road Safety Analysis (QRSA) study using Value Analysis/Explicit Road Safety processes and techniques. The results of the study focus on safety and include recommendations for roadway improvements to Niles Canyon while minimizing the impacts to the environment where possible and prudent. Caltrans held a public meeting on July 20, 2012 allowing FHWA and the Value Analysis teams to present the findings of the study to interested parties. The Road Safety Analysis identified the existing Alameda Creek Bridge as a location in the Niles Canyon corridor where traffic safety could be improved by correcting existing deficiencies.

In addition to the Alameda Creek Bridge Replacement Project, Caltrans is currently proposing two other projects for the Niles Canyon section of SR-84. The impacts of these future Caltrans projects, in addition to other past, present, and future projects in Niles Canyon, are addressed in Section 2.4, Cumulative Impacts.

Figure 1. Project Map



1.2 Statement of Project Objectives and Purpose

1.2.1 Project Objectives

The objectives of this project are to correct most deficiencies associated with the existing facility and improve traffic safety of the Alameda Creek Bridge for all transportation modes.

1.2.2 Project Purpose

This segment of SR-84 is identified in Caltrans's *State Route 84 Corridor System Management Plan* (Caltrans, 2010a) as a location at which traffic volumes are expected to grow, and for which operational and safety improvements are necessary in key areas to maintain the connectivity of the State Highway System.

Caltrans first identified the need to replace the Alameda Creek Bridge 17 years ago. Additionally, based on recommendations of a Federal Highway Administration (FHWA)'s Road Safety Analysis in 2012, the Alameda Creek Bridge was identified as a key safety improvement in the Niles Canyon corridor. In order to achieve the connectivity and safety goals of system planning, the deficiencies of the bridge should be addressed, which will also provide the safety benefits of a structure with modern geometry. Factors contributing to this assessment include the following facility deficiencies:

- Poor sight distances
- Low design speeds
- Bridge railings that do not offer the structural integrity of modern railing
- Bridge railings that do not provide the capability to redirect vehicles back into the roadway in the event of a collision
- Lack of width for bicycles to share the roadway
- Lack of width to allow for maneuvers to avoid collisions

Of the above deficiencies, the most crucial are the obsolete railing and lack of shoulders on the Alameda Creek Bridge. The current railing is not expected to withstand some foreseeable accident related impacts, and the lack of shoulders eliminates space needed by motorists maneuvering to avoid collisions.

Although the bridge is structurally adequate at the present time, it is currently classified as "functionally obsolete", meaning that it is no longer functionally adequate for its task due to the design deficiencies listed above. The Alameda Creek Bridge has exceeded its useful service life and, at 87 years old, has exceeded the original 50-year design life of the structure. The bridge exhibits signs of structural deterioration with spalling concrete exposing the underlying reinforcing steel to the elements and to rusting.

Accident analysis based on 1999 to 2012 traffic data shows a total of 12 collisions, six of which involved injuries, on the Alameda Creek Bridge. The collisions on the bridge included three cross-into-opposite-lane collisions, three head-on collisions, one instance of hitting the bridge approach guard railing, one instance of hitting the side of the bridge railing, and four hit-object collisions. Vehicles hitting the side of bridge railings and the bridge approach guard railings constitute the hit-object type accidents. The actual fatality

and injury rate of 1.13 within the bridge limits is more than double the state average rate (0.56) for similar facilities. In addition, the total accident rate (2.06) is significantly higher than the state average rate (1.31) for similar highway facilities. FHWA's Road Safety Analysis indicated that the number of accident rates at the Alameda Creek Bridge and eastern and western approaches are higher than they would be with a facility that meets current design standards.

1.3 Project Description

The Alameda Creek Bridge Replacement Project proposes to replace the Alameda Creek Bridge, along with realigning the eastern and western approaches to the bridge, on SR-84 from postmile 13.0 to 13.6. The Alameda Creek Bridge has exceeded its useful service life and, at 87 years old, has exceeded the original 50-year design life of the structure. The bridge exhibits signs of structural deterioration with spalling concrete exposing the underlying reinforcing steel to the elements and to rusting. The purpose of the proposed project is to correct these deficiencies and improve traffic safety by replacing the existing bridge. Four alternatives have been carried forth for further analysis in the draft EIR and are described in greater detail below. Other alternatives were previously considered but eliminated from further discussion, as described in Section 1.4.3.

1.4 Alternatives

1.4.1 Project Alternatives

Refer to Appendix E for design plans of the Build Alternatives.

Build Alternative 1

SUMMARY:

Build Alternative 1 would replace the existing Alameda Creek Bridge and construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. Build Alternative 1 would realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. The larger radius of the curve would improve sight distance and reduce the number of errant vehicles that might otherwise cross the centerline or run off the roadway. The new alignments for both the western and eastern approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The roadway on the new alignment sections would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and a three-foot "choker" (also known as an unpaved three-foot shoulder). Build Alternative 1 would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Build Alternative 1 would construct a new 410-foot long, 46-foot wide, Cast-in-Place (CIP) box girder bridge, with a 705-foot-radius curve, on the north side of the existing bridge. The new bridge will be supported by two on-land abutment foundations and two columns. One column will be placed in the stream and the other column will be located outside of the stream channel. The western alignment approach would be 1,400-feet long

and would require embankment fill for its entire length. Realignment of the eastern approach would require the installation of a 1,190-foot long steel-reinforced concrete retaining wall (Caltrans Type 1) and 1,090-foot long concrete soil-nail wall. The 1,190-foot long Type 1 retaining wall would be located on the creek side of SR-84 (called the WB wall). The Type 1 retaining wall would vary in height from a minimum of 13 feet to a maximum of 36 feet. The 1,090-foot long concrete soil-nail wall would be located on the hill side of SR-84 (called the EB wall) and would vary in height from a minimum of four feet to a maximum of 20 feet.

Additionally, Build Alternative 1 proposes to remove the existing Alameda Creek Bridge as well as remove the existing footings and wall of an older bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal Endangered Species Act (ESA) consultation and the following permits: California Department of Fish and Wildlife (CDFW) 1602 Streambed Alteration Agreement and Clean Water Act (CWA) Section 404 and 401 permits.

SPECIFIC DESIGN FEATURES:

Box-girder section

The box-girder section of the bridge would be 410-feet long, 46-feet wide, and six-feet deep. The new bridge would be a three-span concrete structure supported on two on-land abutments and two concrete support columns. One column will be placed in the stream and the other column will be located outside of the stream channel. The concrete girders and the bridge deck would be placed on top following the construction of the abutments and columns. The equipment used for this operation would be placed on the temporary access areas created for bridge construction. The new bridge surface would be banked through the curve of the bridge traverse to allow for safer travel.

Foundations

Each of the two columns for the new bridge would be installed using the CIDH method. Each column would be 5.5 feet by 8.0 feet, ship-shaped (flattened oval) in cross section. Each column would be installed using a 10-foot-in-diameter CIDH pile that would be drilled using a rig-mounted auger. Rebar would be placed in the holes and the holes filled with concrete. The rebar would be extended beyond the holes for connection with columns. Isolation casing consisting of a steel cylinder would be placed at the location of the pile hole and driven into the alluvium deposits of Alameda Creek, no deeper than 15 feet. The groundwater from dewatering during the construction of the CIDH piles would be placed into a settling tank before being released at a site downstream. All dewatering would adhere to Caltrans dewatering Best Management Practices (BMPs) (Caltrans, 2010b). Forms would be placed around the rebar extending out of the footings and filled with concrete to construct the columns.

The foundation of the eastern and western bridge abutments would be supported on spread footings. The bridge abutment foundations would also be supported on CIDH piles; each abutment would be supported on a row of fourteen piles, each of which is approximately 16-inch in diameter, drilled to a depth that would provide a stable foundation.

Temporary Falsework

Construction of box-girder sections would involve the placement of falsework within the Alameda Creek channel. With the implementation of the temporary creek diversion, a dry working environment is anticipated to set up the temporary falsework. Access to the creek bed for the construction of the temporary falsework would be via previously constructed access roads used for the geotechnical borings. All falsework installation and removal would be completed between June 1 and October 15.

Pavement Section

The project would construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. The new alignments for both the western and eastern bridge approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The new alignments would connect the new bridge to the existing SR-84 alignment at conforms at the western and eastern project limits. The new western approach alignment would be 1,400-feet long while the new eastern alignment approach would be 1,200-feet long (consisting of both overlay and widening). The western alignment approach requires embankment fill for its entire length. The embankment would have 2:1 slopes on the northern side (railroad tracks side), 4:1 slopes on the southern side.

The roadway on the sections of new alignment would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and an unpaved three-foot "choker" (also known as an unpaved three-foot shoulder) on each side, for a total of 48 feet (42 feet is completely paved; 48 feet total including the unpaved three-foot chokers). In order to connect the bridge with the old alignment, the roadway would go through one curve of radius 705-feet. Build Alternative 1 would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

To construct the new pavement section, the path of the new alignment would be cleared and grubbed, and the original ground excavated or filled as necessary to create a path traversable at the planned design speed (accomplished with a bulldozer equipped with a scraper), and the area compacted with a compactor. The proposed roadway would be built on the embankment and would be approximately two-feet thick. The structural section would then be built up by placing pavement structural subbase followed by asphalt concrete; each layer would be compacted after having been applied. The existing asphalt concrete would be overlaid with new asphalt concrete at the conform area.

Temporary construction impacts for areas not constructed on fill would not extend beyond the edge of the new roadway.

Western Approach: Grading and Fill

To construct the new western alignment, fill would be used to raise the roadway profile by up to 16.3 feet from the northern edge of the new bridge to the western conform with the existing alignment. Along the new alignment, the area of fill would extend to the south from a minimum of three feet up to a maximum of eight feet from the proposed new east bound (EB) edge of pavement for a distance of 1,400 feet to establish a 4:1 embankment slope. The area of fill would extend to the north from a minimum of three feet up to a maximum of 40 feet from the proposed new westbound (WB) edge of pavement for a distance of 1,400 feet to establish a 2:1 embankment slope. The maximum width of the embankment from toe-of-slope to toe-of-slope is 80 feet. To construct the embankment, no excavation is required. Engineered fill and/or native material would be installed using dump loaders and compactors. Where space allows, the final four inches of fill would be stockpiled native topsoil or imported topsoil. Revegetation of any disturbed areas would occur post construction in accordance with Caltrans Standard Specifications (Caltrans, 2010b).

Eastern Approach: Type 1 Retaining Wall and Soil-Nail Wall

As part of the eastern approach realignment component of the project, a 1,090-foot long soil-nail wall and a 1,190-foot long retaining wall would be constructed. The 1,090-foot long soil-nail wall would be constructed east of the existing bridge and immediately south of SR-84, where the hillside adjacent to the SR-84 is cut. The soil-nail wall would vary in height from a minimum of four feet to a maximum of 20 feet. The slope above the soil-nail wall would remain at its existing 1½:1 slope. No vegetation above the soil-nail wall would be disturbed. The wall installation would be completed during the first phase of construction so that two-lane traffic can be maintained during subsequent construction activities.

The eastern approach realignment and widening also requires a Type 1 retaining wall. The Type 1 retaining wall would be approximately 1,190-feet long and 20-feet wide with an average height of 17 feet, a minimum height of 13 feet, and a maximum height of 36 feet, along the northern bank of Alameda Creek. The Type 1 retaining wall would consist of a concrete retaining wall with spread footing that is supported by CIDH piles. Installation of these piles would be similar to the methods discussed above in the design and construction of the new bridge. Although the maximum height of the retaining wall is 36 feet, the footings would be installed approximately five feet below the finished grade so the wall would appear to be a maximum of 31 feet in height.

The existing concrete slope pavement, approximately 16,100 square feet and 8,100 cubic feet, along the west bank of Alameda Creek would be completely removed in order to construct the Type 1 wall footing. Temporary shoring would be used for the Type 1 wall excavation and construction.

Build Alternative 2

SUMMARY:
Build Alternative 2 would replace the existing Alameda Creek Bridge and construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. Build Alternative 2 would realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. The larger radius of the curve would improve sight distance and reduce the number of errant vehicles that might otherwise cross the centerline or run off the roadway. The new alignments for both the western and eastern approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The roadway on the new alignment sections would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and a three-foot "choker" (also known as an unpaved three-foot shoulder). Build Alternative 2 would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Build Alternative 2 would construct a new 500-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, on the north side of the existing bridge. The new bridge will be supported by two on-land abutment foundations and three columns. Two columns will be constructed on either side of the primary creek channel and a third in the secondary channel, closer to the western approach. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length as well as the installation of an 850-foot-long Type 1 retaining wall, varying in height from four to 20 feet. Realignment of the eastern approach would require the installation of a 1,150-foot-long Type 1 retaining wall and a 470-foot long rock cut. The 1,150 foot-long Type 1 retaining wall would be located on the creek side of SR-84 (called the WB wall) and would vary in height from a minimum of 13 feet to a maximum of 36 feet. The 470-foot rock cut would be located on the hill side of SR-84 (called the EB wall) and would vary in height from a minimum of two feet to a maximum of 23 feet.

Additionally, Build Alternative 2 proposes to remove the existing Alameda Creek Bridge as well as remove the existing footings and wall of an older bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

SPECIFIC DESIGN FEATURES:

Box-girder section

The box-girder section would be 500-feet long, 46-feet wide, and six-feet deep. The new bridge would be a three-span concrete structure supported on two on-land abutments and three concrete support columns. Two columns will be constructed on either side of the primary creek channel and a third in the secondary channel, closer to the western approach. The concrete girders and the bridge deck would be placed on top following the construction of the abutments and columns. The equipment used for this operation would be placed on the temporary access areas created for bridge construction. The new bridge surface would be banked through the curve of the bridge traverse to allow for safer travel.

Foundations

The construction and installation of columns and abutments for the new bridge under Alternative 2 are the same as described for Alternative 1. Instead of two columns, however, Alternative 2 would include three columns, each one 5.5 feet by 8.0 feet, ship-shaped (flattened oval) in cross section.

Temporary Falsework

The locations and installation of temporary falsework for the new bridge under Alternative 2 is the same as described for Alternative 1.

Pavement Section

The construction of new pavement sections for the new bridge approaches under Build Alternative 2 are the same as described for Alternative 1, but in order to connect Build Alternative 2 to the bridge with the old alignment, the roadway would go through one curve of radius 650-feet. As with all Build Alternatives, Build Alternative 2 would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Western Approach: Grading and Fill

To construct the new western alignment, fill would be used to raise the roadway profile by up to 16.3 feet from the northern edge of the new bridge to the western conform with the existing alignment. Along the new alignment, the area of fill would extend to the south from a minimum of three feet up to a maximum of eight feet from the proposed new EB edge of pavement for a distance of 1,400 feet to establish a 4:1 embankment slope. The area of fill would extend to the north up to three feet from the proposed new WB edge of pavement for a distance of 1,400 feet to establish a 2:1 embankment slope. The maximum width of the embankment from toe-of-slope to toe-of-slope is 80 feet.

To construct the embankment, no excavation is required. Engineered fill and/or native material would be installed using dump loaders and compactors. Where space allows, the final four inches of fill would be stockpiled native topsoil or imported topsoil. Re-

vegetation of any disturbed areas would occur post construction in accordance with Caltrans Standard Specifications (Caltrans, 2010b).

Under Build Alternative 2, an 850-foot long, Type 1 retaining wall would be constructed on the north side of the new embankment on the western approach to minimize the project's footprint from the installation of fill. The retaining wall would vary in height from a minimum of four feet to a maximum of 20 feet. The wall would be constructed by clearing and grubbing the project area, excavating and compacting the footing location, and constructing the wall using forms, structural steel, and poured concrete.

Eastern Approach: Type 1 Retaining Wall and Rock Cut with Rock-Anchored Wire Mesh
As part of the eastern approach realignment, a 470-foot-long rock cut with rock-anchored wire mesh and a 1,150-foot long retaining wall would be constructed. The 470-foot rock cut with rock-anchored mesh would be constructed east of the existing bridge and immediately south of SR-84, where the hillside adjacent to SR-84 is cut. The rock cut with rock-anchored wire mesh would involve cutting the existing hillside to a maximum slope of ¾:1, ranging in height from two feet to 23 feet. In addition to the wire mesh, a layer of coconut fibers or jute would be placed underneath the wire mesh where hydroseeding would be placed to encourage vegetation regrowth. The rock cut with the rock-anchored wire mesh would be completed during the first phase of construction so that two-lane traffic can be maintained during subsequent construction activities. A mechanical scraper would be used to clear and grub vegetation, and to make the rock slope cut. Excavated material would be used where possible as fill elsewhere in the project area; excess material would be disposed of outside the project location in accordance with Caltrans Standard Specifications (Caltrans, 2010b).

To construct the rock-anchored wire mesh, the slope would first be cut back to a maximum of ¾:1. A crane would be used for the installation of fabric and mesh. Double-twisted wire mesh would be placed over a coconut fiber layer or jute. The wire mesh is a 12-gauge galvanized, corrosion-resistant wire mesh with a hexagonal opening of 3.3 inches by 4.5 inches, which is attached to the top of the slope using rock anchor bolts or cable anchors. Anchors would be installed by drilling a hole in the slope, placing the anchor in the hole and grouting it into the hole. After the system is installed, hydroseeding would be applied to help stabilize the near-surface slope environment and speed up plant reestablishment.

The eastern approach realignment and widening also requires a Type 1 retaining wall. The Type 1 retaining wall would be approximately 1,150-feet long and 20-feet wide with an average height of 17 feet, a minimum height of 13 feet, and a maximum height of 36 feet. It would be located along the northern bank of Alameda Creek. The Type 1 retaining wall would consist of a concrete retaining wall with spread footing supported by CIDH piles. Installation of these piles would be similar to the methods discussed above in the design and construction of the new bridge. Although the maximum height of the retaining wall is 36 feet, the footings would be installed approximately five feet below the finished grade, so the wall would appear to be a maximum of 31 feet in height. The existing concrete slope pavement, approximately 16,100 square feet and 8,100 cubic feet, along

the west bank of Alameda Creek would be completely removed in order to construct the Type 1 wall footing. Temporary shoring would be used for the Type 1 wall excavation and construction.

Build Alternative 3A

SUMMARY:
Build Alternative 3A would replace the existing Alameda Creek Bridge and construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. Build Alternative 3A would realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. The larger radius of the curve would improve sight distance and reduce the number of errant vehicles that might otherwise cross the centerline or run off the roadway. The new alignments for both the western and eastern approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The roadway on the new alignment sections would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and a three-foot "choker" (also known as an unpaved three-foot shoulder). Build Alternative 3A would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Build Alternative 3A would construct a new 450-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, on the north side of the existing bridge. The new bridge would be supported by an abutment foundation at the west approach on a spread footing and three columns. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The new bridge would be comprised of two distinct sections. The first section would be a 450-foot long CIP box girder that crosses the flood channel. The second section would be a series of precast slabs installed as a sidehill viaduct for the eastern approach along 1,170 feet of the existing hillside. The bridge would be constructed as one continuous structure with no abutment or other structural feature between the box girder and precast slabs. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length. Realignment of the eastern approach requires the installation of approximately 800 feet of a combination of rock cuts and soil-nail walls on the hill side (called the EB wall). The combination of rock cuts and soil-nail walls would vary in height from a minimum of two feet to a maximum of twenty-one feet.

Additionally, Build Alternative 3A proposes to remove the existing Alameda Creek Bridge as well as remove the existing footings and wall of an older bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

SPECIFIC DESIGN FEATURES:

Box-girder section

The box-girder section would be 450-feet long, 46-feet wide, and six-feet deep. It would be supported by an abutment foundation at the western approach, constructed on a spread footing, and three columns, each one 5.5 feet x 8.0 feet. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The eastern approach would be supported by a sidehill viaduct section, and those two sections would abut at a paired-set of columns, rather than at an eastern abutment. Once the western abutment and columns are constructed, concrete girders and the bridge deck would be placed on top. The equipment used for this operation would be placed on the temporary access areas created for bridge construction. The new bridge surface would be banked through the curve of the bridge traverse to allow for safer travel.

Sidehill Viaduct Section

A 1,170-foot long sidehill viaduct section would be constructed adjoining the eastern end of the box-girder section. It would be between 10-46 feet wide. At its widest point, the sidehill viaduct section would support the entire WB section of the travel way. At its narrowest point, the sidehill viaduct section supports only the shoulder and barrier. The viaduct section consists of 33 piers on the downslope side, each comprising a rank of one to three columns. The upslope side of the structure rests directly on the slope or embankment. The roadway deck structure would be constructed of precast slabs.

The viaduct is supported by 51 CIDH pile extensions, each one 30-inch in diameter. The extensions reach a maximum depth of 15 feet below original ground. Existing concrete slope protection would be demolished at the site of each pile. A drill rig would be used from the roadway to bore holes for the CIDH piles. Rebar is placed into the hole and the hole is filled with concrete. A form is placed in the hole for the above-ground section of the pile, the form is filled with concrete, and eventually removed when set. Slope protection would then be repaired. For installation of precast slabs, precast slabs are brought in by truck and placed. The sidehill viaducts would be constructed from the roadway; there would be no construction impacts beyond the roadway footprint for each viaduct. After the construction of the rock cuts with rock-anchored wire mesh, the traffic would be moved over to the newly widened roadway. Although the existing WB lane would be used for constructing the sidehill viaduct, two lanes of traffic would remain open during the staged construction.

Existing concrete slope pavement along the west bank of Alameda Creek would be removed only at the location necessary to construct the piers to support the sidehill viaduct. The remainder of the existing concrete slope would be left in place to maintain erosion control. Because two existing drainages cross SR-84 in this portion of the project footprint, two new culverts would be installed to convey runoff from these drainages under the SR-84 roadway surface.

Foundations

The methods for construction and installation of columns and the western abutment for the new bridge under Alternative 3A are the same as described for Alternative 2.

Temporary Falsework

The locations and installation of temporary falsework for the new bridge under Build Alternative 3A is generally the same as described for Build Alternative 1.

Pavement Section

The construction of new pavement sections for the new bridge approaches under Build Alternative 3A generally are the same as described for Build Alternatives 1 and 2. Similar to Build Alternative 2, in order to connect Build Alternative 3A to the bridge with the old alignment, the roadway would go through one curve of radius 650-feet. The one difference is that Alternative 3A would require a 1,100-foot long alignment (consisting only of overlay) for the eastern approach instead of a 1,200-foot long alignment as required for Build Alternatives 1 and 2. As with all Build Alternatives, Build Alternative 3A would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Western Approach: Grading and Fill

To construct the new western alignment, fill would be used to raise the roadway profile by up to 15.6 feet from the northern edge of the new bridge to the western conform with the existing alignment. Along the new alignment, the area of fill would extend to the south from a minimum of three up to a maximum of eight feet from the proposed new EB edge of pavement for a distance of 1,400 feet to establish a 4:1 embankment slope. The area of fill would extend to the north from a minimum of three feet up to a maximum of 40 feet from the proposed new WB edge of pavement for a distance of 1,400 feet to establish a 2:1 embankment slope. The maximum width of the embankment is 80 feet.

To construct the embankment, no excavation is required. Engineered fill and/or native material would be installed using dump loaders and compactors. Where space allows, the final four inches of fill would be stockpiled native topsoil or imported topsoil. Construction impacts would extend to a maximum of five feet from the edge of the toe of fill; re-vegetation of any disturbed areas would occur post construction in accordance with Caltrans Standards Specifications (Caltrans, 2010b).

Eastern Approach: Construction of Rock Cuts with Rock-Anchored Wire Mesh

As part of the eastern approach realignment component of the project, a combination of rock cuts with rock-anchored wire mesh and/or soil-nail wall would be constructed. This combination of rock cuts with rock-anchored wire mesh and/or soil-nail wall would extend for approximately 1,150 feet.

A mechanical scraper would be used to clear and grub vegetation, and to make the rock slope cut. Excavated material would be used where possible as fill elsewhere in the

project area; excess material would be disposed of outside the project location in accordance with Caltrans Standard Specifications (Caltrans, 2010b). To construct the rock-anchored wire mesh, the slope would first be cut back to a maximum of ¾:1. A crane would be used for the installation of fabric and mesh. Double-twisted wire mesh would be placed over a coconut fiber layer or jute. The wire mesh is a 12-gauge galvanized, corrosion-resistant wire mesh with a hexagonal opening of 3.3 x 4.5 inches, which is attached to the top of the slope using rock anchor bolts or cable anchors. Anchors would be installed by drilling a hole in the slope, placing the anchor in the hole and grouting it into the hole. After the system is installed, hydroseeding would be applied to help stabilize the near-surface slope environment and speed up plant reestablishment.

Build Alternative 3B

SUMMARY:
Build Alternative 3B would replace the existing Alameda Creek Bridge and construct a new, two-lane roadway section along a northern alignment, parallel to the existing SR-84 alignment. Build Alternative 3B would realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. The larger radius of the curve would improve sight distance and reduce the number of errant vehicles that might otherwise cross the centerline or run off the roadway. The new alignments for both the western and eastern approaches would be a maximum distance of 75 feet north of the current SR-84 alignment. The roadway on the new alignment sections would consist of a twelve-foot lane in each direction, eight-foot shoulders, a two-foot median soft barrier (suitable for a rumble strip), and a three-foot "choker" (also known as an unpaved three-foot shoulder). Build Alternative 3A would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Build Alternative 3B would construct a new 450-foot long, 46-foot wide, CIP box girder bridge, with a 650-foot-radius curve, north of the existing bridge. The new bridge would be supported by an abutment foundation at the west approach on a spread footing and three columns. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The new bridge would be comprised of two distinct sections. The first section would be a 450-foot long, CIP box girder that crosses the flood channel. The second section would be a series of precast slabs installed as a sidehill viaduct along 250 feet of the existing hillside. The bridge would be constructed as one continuous structure with no abutment or other structural feature between the sections; the two sections would abut at a paired-set of columns. The western alignment approach would be 1,400-feet long and would require embankment fill for its entire length. Realignment of the eastern approach would require the construction of a 300-foot-long rock cut with anchored wire mesh on the hill side (called the EB wall). The rock cut would vary in height from a minimum of two feet to a maximum of 17 feet.

Additionally, Build Alternative 3B proposes to remove the existing Alameda Creek Bridge as well as remove the existing footings and wall of an older bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal Endangered Species Act (ESA) consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

SPECIFIC DESIGN FEATURES:

Box-girder section

The box-girder section would be 450-feet long, 46-feet wide, and six-feet deep. The new bridge would be supported by an abutment foundation at the west approach on a spread footing and three columns, each one 5.5 feet by eight feet. The two eastern columns would be located on either side (outside) of the primary creek channel and the western column would be located outside the creek. The eastern approach would be supported by a sidehill viaduct section, rather than by an eastern abutment as in Build Alternatives 1 or 2. Once the western abutment and columns are constructed, the concrete girders and the bridge deck would then be placed on top. The equipment used for this operation would be placed on the temporary access areas created for bridge construction. The new bridge surface would be banked through the curve of the bridge traverse to allow for safer travel.

Sidehill Viaduct Section

A 250-foot long sidehill viaduct section would be constructed adjoining the eastern end of the box-girder section. It would be seven spans, varying between 10-46 feet wide. At its widest point, the sidehill viaduct section would support the entire WB section of the travel way; at its narrowest point, the sidehill viaduct section would support only the shoulder and barrier. Under Alternative 3B, the viaduct section would consist of seven piers on the downslope side, each comprising a rank of one to three columns. The upslope side of the structure rests directly on the slope or embankment. The roadway deck structure would be constructed of precast slabs.

The viaduct is supported by 12 CIDH pile extensions, each one approximately 30 inches in diameter. The extensions reach a maximum depth of 15 feet below original ground. Existing concrete slope protection would be demolished at the site of each pile. A drill rig would be used from the roadway to bore holes for the viaduct CIDH piles. Rebar is placed into the hole and the hole is filled with concrete. A form is placed in the hole for the above-ground section of the pile, the form is filled with concrete, and eventually removed when set. Slope protection would then be repaired. For installation of precast slabs, precast slabs are brought in by truck and placed. The sidehill viaduct would be constructed from the roadway; there would be no construction impacts beyond the roadway footprint for the viaduct. After the completion of the rock cut with rock-anchored wire mesh, the traffic would be moved over to the newly widened roadway. Although the existing WB lane would be used for constructing the sidehill viaduct, two lanes of traffic would remain open during the staged construction.

Existing concrete slope pavement along the west bank of Alameda Creek would be removed only at the location necessary to construct the piers to support the sidehill viaduct. The remainder of the existing concrete slope would be left in place to maintain erosion control. Because two existing drainages cross SR-84 in this portion of the project footprint, two new culverts would be installed to convey runoff from these drainages under the SR-84 roadway surface.

Foundations

The methods for construction and installation of columns and the western abutment for the new bridge under Build Alternative 3B are the same as described for Build Alternative 2.

Temporary Falsework

The locations and installation of temporary falsework for the new bridge under Alternative 3A is the same as described for Alternative 1.

Pavement Section

The construction of new pavement sections for the new bridge approaches under Build Alternative 3B generally are the same as described for Alternative 1. The one difference is that Build Alternative 3B would require a 500-foot long alignment (consisting only of overlay) for the eastern approach instead of a 1,200-foot long alignment as required for Build Alternatives 1 and 2. As with all Build Alternatives, Build Alternative 3B would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84.

Western Approach: Grading and Fill

To construct the new western alignment, fill would be used to raise the roadway profile by up to 15.6 feet from the northern edge of the new bridge to the western conform with the existing alignment. Along the new alignment, the area of fill would extend to the south from a minimum of three up to a maximum of eight feet from the proposed new EB edge of pavement for a distance of 1,400 feet to establish a 4:1 embankment slope. The area of fill would extend to the north from a minimum of three feet up to a maximum of 40 feet from the proposed new WB edge of pavement for a distance of 1,400 feet to establish a 2:1 embankment slope. The maximum width of the embankment from toe-of-slope to toe-of-slope is 80 feet.

To construct the embankment, no excavation is required. Engineered fill and/or native material would be installed using dump loaders and compactors. Where space allows, the final four inches of fill would be stockpiled native topsoil or imported topsoil. Re-vegetation of any disturbed areas would occur post construction in accordance with Caltrans Standard Specifications (Caltrans, 2010b).

Eastern Approach: Construction of Rock Cut with Rock-Anchored Wire Mesh
As part of the eastern approach realignment component of the project, a single rock cut (instead of multiple rock cuts and soil-nail walls as described in Alternative 3A) with rock-anchored wire mesh would be constructed. The rock cut would be 300-feet long with heights varying from two to 17 feet. Construction methods for the rock cut are the same as described in Build Alternative 3A.

1.4.1.1 Common Design Features of the Build Alternatives

Geotechnical Investigations
The locations for geotechnical investigations would be the same under all four Build Alternatives and would occur to obtain geotechnical and geologic samples of the supporting strata for the new bridge structures. At a minimum, eleven sampling locations would occur within the project limits; borings would be conducted at the locations of the two proposed bridge abutments, two of the concrete support columns, western bridge approach and eastern bridge approach. Drill holes would be closed using backfill with neat cement grout by tremie method in accordance with Alameda County Water District (ACWD) Zone 7 requirements.

Temporary Creek Diversion
A temporary creek diversion is proposed to create a dry working environment within the creek bed during each of the three annual construction windows (June 1 to October 15) proposed over the duration of the project. The same temporary creek diversion limits are proposed for each construction window. The temporary creek diversion involves the installation of two temporary earthen dams, one upstream of the work area to prevent inflow, and one downstream to prevent backflow.

Temporary impacts to construct and maintain the temporary creek diversion would extend 54 feet upstream of the remnants of the former bridge footings and concrete wall (weir) and 54 feet downstream from the drip line of the existing Alameda Creek Bridge. All construction equipment used for the construction of the creek diversion would use the construction access roads for geotechnical borings.

The means and methods of the installation may include installation of temporary berms (plastic-wrapped gravel bags, or Aquadams) to create a dry working environment for the installation of the temporary earthen dams, and to control sediment dispersal within the creek. In addition, a cutoff wall may be necessary to reduce the flow of water through the substrate under the upstream dam and/or temporary berms. The cutoff wall would consist of a two-foot deep by two-foot wide trench, spanning the width of the creek, with impermeable material placed below grade to reduce seepage into the work area. The trenching and construction of the cut off wall would not occur in the flowing Alameda Creek; the berm would be built first, followed by the trenching and construction of the cut off wall.

The temporary earthen dam would be constructed 30-foot wide at the base, approximately six-feet tall, with 2:1 side slopes. Prior to placement of the dam, sharp objects, boulders, and cobbles would be removed from the dam area to create a smooth

streambed and prevent channels by which water can pass beneath the dam after it is built; these objects would be removed by hand or, if necessary, by a grapple located on either side of the creek. The water would flow by gravity through the construction site in a single, four foot-diameter pipe; the pipe would run along the southern bank of the creek as to not impede access across the job site.

An additional area of 12 feet upstream from the upstream base of the dam, and 12 feet downstream from the downstream base of the dam, is proposed for access to construct the temporary dam, and may have temporary impacts by construction/equipment staging.

A temporary roadway/ramp would be constructed in the dry creek bed for each individual creek diversion construction window. The temporary roadway/ramp would be constructed of native creek material (the temporary creek diversion and all equipment in the creek must be removed by October 15). Heavy equipment, trucks, the drill rig, and other construction equipment would use this temporary roadway/ramp while working in the creek area.

During the demolition of the old Alameda Creek Bridge, the area underneath the bridge and extending approximately 10 feet from either edge of the bridge would be covered with a temporary ground cover consisting of plastic sheets, tarps, and/or plywood sheets. No temporary stockpiling of material in the creek is proposed; if any material falls in the creek during the demolition of the bridge, it must be removed immediately.

Bridge Demolition

Demolition of the existing Alameda Creek Bridge would occur following the transfer of traffic to the new Alameda Creek Bridge. The existing bridge would be demolished beginning in the middle of the bridge span and working outwards. A falsework platform structure would be installed below the bridge prior to dismantling to prevent debris from falling in Alameda Creek. The existing concrete railings would be jack hammered and removed in smaller pieces. It is anticipated that segments of the Alameda Creek Bridge superstructure would be saw cut into relatively large pieces and removed by a crane situated on the abandoned SR-84 road alignment. Following the removal of the bridge, construction equipment would access the Alameda Creek using the abandoned SR-84 alignment and use of a ramp down into the dry streambed in order to remove the columns. The columns would be jackhammered and cut down to approximately two feet below streambed elevation with a hoe ram (a piece of equipment similar to a jackhammer). The steel portions would be reclaimed and recycled.

For demolition work, a backhoe or excavator with a fitted hoe ram would be used to break up the abutments. A loader would then be used to collect the debris to be hauled away by trucks. During the demolition of the old Alameda Creek Bridge, the area underneath the bridge deck and extending approximately 10 feet from either edge of the bridge would be covered with a temporary ground cover consisting of plastic, sheets, tarp, and/or plywood sheets. No temporary stockpiling of material in the creek would be proposed; if any material falls in the creek during the demolition of the bridge, it would be removed immediately.

The final stage of the proposed project would be the removal of the old approach pavement on either side of the bridge down to the subbase with an excavator. The road surface and road foundation materials from the abandoned SR-84 alignment would be removed and disposed of off-site. After clearing and removal, the old road grade would be re-contoured to match the surrounding area, restored, and planted with native vegetation.

Weir Removal

The project also proposes to remove the existing footings and wall of a former bridge located upstream of the existing Alameda Creek Bridge (refer to Figure 2). These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to serve as compensatory mitigation for impacts associated with federal ESA consultation and the following permits: CDFW 1602 and CWA Section 404 and 401 permits. The removal of the weir is not considered mitigation for any level of CEQA significance.

Currently, two bridge footings and a concrete weir (wall) are located in the creek.

Figure 2. Old Bridge Footings and Wall (Concrete Weir) Proposed for Removal

Table 1. Dimensions for Existing Weir

Description	Length	Width	Height	Concrete removal (cubic yards)*
Footing 1	33 feet	14 feet	6 feet	103
Footing 2	30 feet	14 feet	6 feet	94
Wall	152 feet	3 feet	6 feet	102
Total concrete removal:				**298**

*The concrete removal quantities assume a 4 foot height for each of the bridge footings and for the concrete wall and 2 feet below original ground.

Access to the creek bed for weir removal would be via construction access roads or already existing roads created to conduct geotechnical borings. With the temporary creek diversion in place for the demolition of the existing Alameda Creek Bridge, the demolition of the concrete weir would occur simultaneously. Caltrans water quality BMPs would to minimize creek impacts (Caltrans, 2010b). A temporary ground cover would be used to minimize debris in the creek during weir demolition. A backhoe or excavator with fitted hoe ram would be used to break up the weir wall and foundations. Then a loader would be used to collect debris to be hauled away by trucks.

Bridge Railing

The Texas Bridge Railing (Texas C412) and ST-70 are proposed as the bridge railing options. At this time, the Texas Bridge Railing is the preferred bridge railing option as this see-through bridge railing minimizes aesthetics/visual impacts while emulating the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives.

<u>Texas Bridge Railing (Texas C412)</u>

The C412 is a see-through concrete barrier that closely matches the existing bridge railing on the Alameda Creek Bridge. The C412 concrete safety barrier, a 42-inch high continuous concrete railing that is mounted on a two-foot wide, eight-inch tall curb, would be installed at either edge of the deck. A parabolic soffit (concrete arch) would be constructed between each column and between the final column and the abutment on the underside of the structure. Architectural features intended to evoke the existing Alameda Creek Bridge would include raised panels on each bent cap on the sides of the structure and gothic arches on the parapet openings. Refer to Section 2.1.4 for visual simulations of the proposed Alameda Creek Bridge with the C412 bridge railing.

<u>ST-70</u>

The second proposed bridge railing is ST-70 metal see-through rail. In the event that Caltrans Headquarters does not approve the C412, the ST-70 bridge railing would be proposed. Refer to Section 2.1.4 Visual/Aesthetics for visual simulations of the proposed Alameda Creek Bridge with the ST-70 bridge railing.

Width of the new bridge structure and east/west bridge approaches
The total width of the new bridge would be 46 feet, consisting of a two-foot wide median barrier, two 12-foot wide travel lanes, two eight-foot shoulders, and two feet on either side of the bridge for the installation of the bridge railing. The new east and west bridge approach alignments would be 48-feet wide consisting of a two-foot soft median barrier (suitable for a rumble strip), two lanes that are 12 feet wide with eight-foot shoulders in each direction, and two, three-foot unpaved "chokers" (also known as an unpaved three-foot shoulder).

Utility Relocation
It is anticipated that two utility poles within the project limits would need to be relocated. Construction impacts associated with pole relocation is the auguring of holes, approximately 18-inch-in-diameter and seven-feet deep, from the roadway and the installation of new poles in these holes.

Revegetation
In areas of temporary construction impact, appropriate replacement native vegetation would be planted in areas where they would not affect roadway safety. The old alignment would be remediated and replanted with appropriate native vegetation/trees. Specifications regarding vegetation and tree replacement would be provided during the design phase of the project (estimated to be completed in 2016).

Invasive giant reed populations (*Arundo donax*) located within the project footprint would be removed and replaced with native vegetation.

Right of Way and Easements
Where construction activities would occur outside of existing Caltrans' Right of Way, appropriate easements or other permits would be acquired prior to project initiation. Table 2 summarizes the anticipated right of way requirements.

Table 2. Right of Way Requirements

Acquired from	**Parcel size** (square feet)
Alameda County	95,000
San Francisco Water Department	15,600
Alameda County Water District	12,000
San Francisco Public Utilities Commission (SFPUC)	9,100

Traffic Management Plan
The proposed project would require stage construction plans, construction area sign plans, and a Traffic Management Plan (TMP). The TMP would be implemented during construction to minimize and prevent delay and inconvenience to the traveling public. For the construction of all Build Alternatives, the roadway would be temporarily shifted towards the cut slope. Short-term lane closures would be necessary to facilitate construction. These short-term lane closures would occur on the weekends and during

off-peak hours as to not affect peak-hour traffic (between 6 am – 10 am and 3 pm - 7 pm) during the weekdays.

The TMP would include public information through the use of brochures, mailers, and press release. Press release would notify motorists, businesses, community groups, local entities, emergency services, and politicians of upcoming closures or detours. The TMP for use during construction is the following: Changeable Message Signs (portable), Ground Mounted Signs, Detour Maps, and Bicycle Community information. A Construction Zone Enhanced Enforcement Program would be provided during lane closure. Lane closure charts would be included in the Special Provisions.

1.4.1.2 No-Build Alternative

Under the No-Build Alternative, the project would not be constructed. Operational deficiencies at the Alameda Creek Bridge would remain. The No-Build Alternative is considered the environmental baseline against which potential environmental impacts of the Build Alternatives are compared.

1.4.2 Comparison of Alternatives

The following table presents a comparison of the Build Alternatives.

Table 3. Summary of Alternatives

Feature	Alternative 1	Alternative 2	Alternative 3A	Alternative 3B
New Bridge				
Total Length (feet)	410	500	450	450
Columns	2	3	3	3
Bridge Spans	3	4	4	4
Sidehill Viaduct				
Total Length (feet)			1,170	250
Spans			30	7
Western Approach				
Embankment fill (feet)	0 to 16.3	0 to 16.3	0 to 15.4	0 to 15.6
Slope				
Eastbound	4 to 1	4 to 1	4 to 1	4 to 1
Westbound	2 to 1	2 to 1	2 to 1	2 to 1
Roadway				
Total Length (feet)	1,400	1,400	1,400	1,400
Retaining Wall				
Type		Type 1		
Total Length (feet)		850		
Height (feet)		4 to 20		
Eastern Approach				
Roadway				
Total Length (feet)	1,200	1,200	1,100 (overlay only)	500 (overlay only)
WB Wall (Creek Side)				
Type	Type 1	Type 1		
Total Length (feet)	1,190	1,150		
Height (feet)	13 to 36	13 to 36		
EB Wall (Hill Side)				
Type	Soil-Nail Wall	Rock Cut	Soil-Nail Walls and Rock Cuts	Rock Cut
Total Length (feet)	1,090	470	800	300
Height (feet)	4 to 20	2 to 23	2 to 21	2 to 17

1.4.3 Alternatives Considered but Eliminated from Further Discussion

The alternative analysis process initially considered a broad range of alternatives to fulfill the project objectives. These included alternatives and options suggested by the public and other interested parties during the project's scoping process. Ultimately, the

following alternatives were evaluated and eliminated from further consideration based on feasibility, costs, environmental and engineering considerations, and failure to meet the project objectives and purpose of the project:

Correct the western alignment approach and replace bridge railing
Reason for rejection: An alternative that corrects the sharp eastbound and westbound curve approaches and replaces the bridge railing was rejected from further analysis. This alternative does not address a key safety element of providing shoulders for vehicles to maneuver and avoid collisions on the bridge. In addition, this alternative does not provide width for bicycles to share the roadway. Full shoulders are important safety features that allow vehicles to take corrective action to avoid collisions, and provide room for disabled vehicles. Piecemeal improvements that do not fully address the project's objectives and purpose cannot be supported as the aging and functionally obsolete structure would otherwise remain as-is. The safety benefits of a new bridge on a new alignment far outweigh the minimally reduced environmental impacts of piecemeal improvement alternatives. This alternative corrects only four of the six deficiencies associated with the existing facility: poor sight distances; low design speeds, bridge railing that does not offer the structural integrity of modern railing, and bridge railing that does not provide the capability to redirect vehicles back into the roadway in the event of a collision.

Widen the Existing Bridge and Bring up to Current Standards
Reason for rejection: Caltrans determined that the existing bridge cannot be widened in place because it would require stage removal, which would be necessary to keep SR-84 open during construction. Stage removal of the Alameda Creek Bridge would entail: 1) removal of about half of the bridge in the longitudinal direction, 2) construction of a wider replacement bridge in its place, 3) transfer of vehicular traffic to the new bridge, 4) removal of the remaining half of the existing bridge, and 5) construction of the second half of the wider bridge (Caltrans, 1997). Removal of the existing bridge in stages would not be structurally adequate to carry traffic loads. Complete closure of SR-84 at the project location would sever the main regional connection between I-880 and I-680. In addition, the existing bridge does not have the structural capacity to carry the additional weight of widening to provide standard shoulders.

Furthermore, in addition to the bridge not being adaptable to stage removal, Caltrans' Division of Engineering Services determined it was more cost-effective to replace rather than upgrade the existing structure, and therefore recommended the construction of a new replacement bridge with a revised alignment.

Replace Existing Bridge at the Existing Location
Reason for rejection: Similar to the rejection of the "Widen the existing bridge to bring up to current standards" alternative, replacing the existing bridge at the existing location would result in the complete closure of SR-84, severing the main regional connection between I-880 and I-680.

Southern Alignment

Reason for rejection: A southern alignment would require removing portions of the nearby National Register of Historic Places (NRHP) eligible Sunol Aqueduct as well as the construction of a 50 foot high embankment cut and a retaining wall at the south end of the bridge. The southern alignment would result in greater impacts to the riparian corridor of the Alameda Creek and require more extensive excavation of the hillside to the east of the bridge to accommodate the new road alignment. The environmental impacts of a southern alignment alternative to the Sunol Aqueduct and the Alameda Creek riparian corridor were determined to be more damaging than the proposed Build Alternatives so it was rejected from further analysis.

1.5 Project Cost and Funding

As of November 2014, the estimated total project cost is approximately $39 million. This estimate includes project development, engineering, right-of-way acquisition, utility relocation, construction capital, and construction support. The project is proposed to be funded from both state and federal sources.

1.6 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 4. Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species and review and comment on CWA 404 Permit.	Consultation to occur prior to final environmental document.
United States Army Corps of Engineers (USACE)	CWA Section 404 permit for filling or dredging waters of the United States.	CWA Section 404 Two nationwide permits would be obtained for the proposed project. The first permit will be acquired for the geotechnical borings and the second permit will be acquired prior to the construction of the Alameda Creek Bridge.
California Department of Fish and Wildlife (CDFW)	1602 Agreement for Streambed Alteration Incidental Take Permit for Threatened and Endangered Species	Incidental Take Permit and 1602 Agreement would be acquired prior to the geotechnical borings.
Regional Water Quality Control Board (RWQCB)	CWA Section 401	CWA Section 401 Water Certifications would be obtained prior to the CWA 404 nationwide permits.
National Marine Fisheries Service (NMFS)	Section 7 Consultation for Threatened and Endangered Species	Consultation to occur prior to final environmental document.

Chapter 2 - Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

The following sections are based in large part on the technical reports referenced in Chapter 6 – References. Persons interested in more complete discussions of technical issues can review these reports at the Caltrans District 4 Office of Public Affairs, located at 111 Grand Avenue, Oakland, CA, 94612.

As part of the scoping and environmental analysis conducted for the project, Caltrans considered the following environmental resources. The Build Alternatives would not result in adverse impacts to the resources discussed below; consequently, there is no further discussion of these resources in this document:

AGRICULTURE/FORESTRY/FARMLANDS/TIMBERLANDS
No agricultural, timberland, or forest land would be lost or converted as part of the proposed project and no prime agricultural land or the lands associated with the California Lands Conservation Act of 1965 (also known as the Williamson Act) would be used for this project.

AIR QUALITY
The proposed project is located within the San Francisco Bay Area Air Basin, which is characterized by complex terrain consisting of coastal mountain ranges, inland valleys and bays. The Bay Area Air Quality Management District (BAAQMD) administers air quality regulations for the San Francisco Bay Area Air Basin.

Of the six transportation related criteria pollutants established under both the National and the California Ambient Air Quality Standards, the Bay Area Air Basin does not attain the national eight-hour ozone and the 24-hour $PM_{2.5}$ (particulate matter less than 2.5 micrometers in diameter) standards. The Bay Area is in attainment for the national annual $PM_{2.5}$ standard and unclassified for the national 24-hour PM_{10} (particulate matter less than 10 micrometers in diameter) standards. The area has not exceeded the national or state carbon monoxide (CO) standards for many years and is now recognized as an attainment/maintenance area for CO. The Bay Area is in nonattainment under the state standards for both PM_{10} and $PM_{2.5}$.

This project is exempt from regional and project-level air quality conformity requirements under 40 Code of Federal Regulations (CFR) 93.126 as it is to reconstruct a bridge with no additional travel lane/lanes (see §93.126, Table 2 – Exempt Projects). The proposed bridge replacement will not create or alter roadway intersections where localized hot-spots mostly likely to occur. The nearest sensitive receptor is more than 3,000 feet away from the construction area. Sensitive receptors are locations where people susceptible to the effects of air pollutants may stay for an extended period of time, which include land uses or facilities such as residences, schools, playgrounds, childcare centers and hospitals. The proposed project would not cause exceedances or new violations of the National or California Ambient Air Quality Standards.

The BAAQMD adopted the 2010 Clean Air Plan provides a comprehensive plan to improve air quality and protect public health by achieving compliance with the state ozone standards as well as reducing other air pollutants in the Air Basin. The proposed project will not interfere with the plan and will provide transportation benefits that reduce pollutant emissions by improving traffic operations.

The proposed project would generate air pollutants during the construction period, which is expected to last a total of three years. Trucks and construction equipment emit hydrocarbons, oxides of nitrogen, carbon monoxide and particulates associated with grading, hauling and various other activities. The impacts from the above activities are considered temporary and would vary from day to day as construction progresses. There are no sensitive receptors close enough to the project to be affected by the emissions. However, to minimize air quality impacts from construction activities, control measures will be implemented as specified in the Environmental Stewardship Section of Caltrans Standard Specifications - Section 14-9.01 Air Pollution Control and Section 14-9.02 Dust Control (Caltrans, 2010b). No potentially adverse air quality emission impacts are associated with the Alameda Creek Bridge Replacement Project.

COMMUNITY IMPACTS – Community Character and Cohesion, and Relocations

There are no residential or commercial areas in the Alameda Creek Bridge Replacement Project vicinity. The project would not change public access, divide neighborhoods, separate residences from community facilities, change the quality of life, or increase urbanization or isolation. There would be no relocations as a result of this project. No minority or low-income populations have been identified that would be adversely impacted by the proposed project.

GROWTH/POPULATION/HOUSING

The project is a highway improvement project that would not alter or increase the capacity of SR-84. The proposed project will maintain the existing two-lane capacity and maintain the existing 45 mph regulatory speed limit of this section of SR-84. The project would have no impacts to growth/population/housing in the area. Land use in the Niles Canyon corridor is protected by the City of Fremont's Area Hill Initiative and Alameda County's Save Agriculture and Open Space Lands Initiative. These initiatives aim to preserve and enhance open space in Alameda County. Land use is further protected by the fact that public agencies own and operate the area surrounding the project vicinity as watershed lands. No impacts to growth/population/housing are anticipated as there are no populations or proposed housing developments in the project vicinity nor are any anticipated in the near future. All Build Alternatives would have no impact to growth/population/housing.

MINERAL RESOURCES

The project does not conflict with any resource recovery plans or operations in the vicinity.

NOISE

The Alameda Creek Bridge Replacement Project would not add a through-traffic lane and would not cause substantial horizontal or vertical alterations. The Alameda Creek Bridge Replacement Project would not increase the capacity of SR-84, but would increase the sight distance and maintain the existing regulatory 45 mph speed limit of SR-84. The increase in noise levels associated with maintaining the regulatory 45 mph speed limit on 0.6 miles of SR-84 is anticipated to be negligible. Noise levels would increase during the construction of the new Alameda Creek Bridge; however, the project is located in a remote area of Niles Canyon with no noise sensitive users in the project vicinity. Noise impacts related to biological resources are addressed in Section 2.3 Biological Environment.

PUBLIC SERVICES

The project would not affect existing public services or measurably increase the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public service. Standard Caltrans Management practices would preclude substantial adverse impacts during construction. Such management practices include the implementation of a Traffic Management Plan (TMP) that would be completed prior to construction to address lane closures and traffic rerouting during construction.

2.1 Human Environment

2.1.1 Land Use

2.1.1.1 Existing and Future Land Use

This section describes the existing and future regional land use in the immediate project area and the surrounding vicinity.

Affected Environment

The proposed project is located within an undeveloped, rural area of Alameda County, frequently referred to as the Niles Canyon corridor. The Niles Canyon corridor is an east-west canyon formed by Alameda Creek, the largest creek in the San Francisco East Bay Region. Over the last 100 years, land ownership by public agencies has largely protected the entire Niles Canyon corridor from development. The land use surrounding the immediate project study area (SR-84, postmile 13.0 to 13.6) is open space, predominately owned by public agencies including Caltrans, Alameda County, SFPUC, SFWD, and Alameda County Flood Control and Water Conservation District (ACFCD). The nearest residential area from the project site is the town of Niles, located at the intersection of SR-84 and Mission Boulevard (SR 238), near the City of Fremont.

The passage of Alameda County's Save Agriculture and Open Space Lands Initiative and the City of Fremont's Hill Area Initiative provide additional layers of protection and further insulate the Niles Canyon corridor from development. The Alameda County electorate passed the Save Agriculture and Open Space Lands Initiative in November 2000 to protect open lands, agriculture spaces, and wildlife habitat. This initiative amended portions of the Alameda County General Plan to conserve and preserve the open spaces of Alameda County while simultaneously confining development of certain

portions of Alameda County. Similar to Alameda County's Save Agriculture and Open Space Lands Initiative, the City of Fremont electorate passed the Hill Area Initiative (also known as Measure T) in 2002. The Hill Area Initiative was incorporated into the City of Fremont's Municipal Code to protect open space and prevent over-development in the Fremont Hills. Development within the designated Hillside Area must conform to numerous special restrictions.

According to the Alameda County Planning Department, the majority of the permits issued in the Niles Canyon corridor are for individual projects, not for residential or industrial planned developments (Piñon-Robinson, 2014). The Alameda County Planning Department also stated no residential or industrial developments in the project area and/or around this part of SR-84, from Mission Boulevard (SR-238) in Fremont to the community of Sunol, are planned for the near future. Therefore, there are no immediate development trends in the project vicinity.

Environmental Consequences

All Build Alternatives

All of the Build Alternatives involve land use changes associated with the acquisition of property for modifications to existing SR-84 facilities and construction of new facilities. The land use designation for the newly aligned portions would change from "Open Space" to "Transportation". The following table quantifies the land use changes and agencies associated with the property acquisitions.

Table 5. Acquired Right of Way

Permanent Right of Way acquired from	Parcel size
Alameda County	95,000 square feet
San Francisco Water Department	15,600 square feet
Alameda County Water District	12,000 square feet
San Francisco Public Utilities Commission	9,100 square feet
Total right of way acquisition	**131,700 square feet**

Although land use changes are associated with the acquisition of undeveloped, open space, the minor parcel acquisitions from Alameda County, the SFWD, the ACWD, and the SFPUC would not adversely impact existing and future land use in the Niles Canyon corridor. Land use protection by the City of Fremont's Area Hill Initiative and Alameda County's Save Agriculture and Open Space Lands Initiative indicates that the proposed project would not directly or indirectly affect existing or future land use in Niles Canyon. Land use is further protected by the fact that public agencies own and operate the area surrounding the project vicinity as watershed lands. No impacts to existing or future land use are anticipated from the acquisition of property for modifications to the state highway system.

Changes in land use are less than significant for all Build Alternatives.

No-Build Alternative
The No-Build Alternative would not result in any changes to land use designations.

Avoidance, Minimization, and/or Mitigation Measures
No avoidance, minimization, and/or mitigation measures are recommended.

2.1.1.2 Consistency with State, Regional, and Local Plans and Programs

Planning goals and policies directing the physical development of the area surrounding Alameda Creek Bridge Replacement Project are described below.

Affected Environment
City of Fremont General Plan Land Use Element/Hill Area Initiative of 2002
The City of Fremont electorate passed the Hill Area Initiative (also known as Measure T) in 2002. The Hill Area Initiative was incorporated into the City of Fremont's Municipal Code to protect open space and prevent over-development in the Fremont Hills. Development within the designated Hillside Area must conform to numerous special restrictions.

Alameda County General Plan
The Alameda County General Plan is a long range policy document approved by the Alameda County Board of Supervisors to guide physical, economic, and environmental growth in Alameda County. The Alameda County General Plan consists of three area plans that address Land Use and Circulation elements for their respective geographic areas, as well as area-specific goals, policies and actions for Circulation, Open Space, Conservation, Safety, and Noise. Although Alameda County addresses Land Use and Circulation Elements on a regional basis, Housing, Conservation, Open Space, Noise, Seismic and Safety and Scenic Route Elements are countywide and contain goals, policies, and actions that apply to the entire unincorporated area.

East County Area Plan
The East County Area Plan is one of three geographic area plans for Alameda County. The East County Area Plan encompass 418 square miles of eastern Alameda County and includes the cities of Dublin, Livermore, Pleasanton, and a portion of Hayward as well as surrounding unincorporated areas, including most of the Niles Canyon corridor. Alameda County has land use jurisdiction over the unincorporated portion of the East County (those areas outside the boundaries of an incorporated city). In November 2000, the Alameda County electorate approved the Save Agriculture and Open Space Lands Initiative. The Initiative amended portions of the Alameda County General Plan, including the East County Area Plan, with the intent of preserving and enhancing agriculture and agricultural lands, and to protect the natural qualities, wildlife habitats, watersheds, and open space of Alameda County from development (Alameda County, 2002).

State Scenic Highway Program
SR-84 through Niles Canyon is designated as a State Scenic Highway and protected by a State Scenic Highway Program. The 7.2 mile scenic highway encompasses Niles Canyon Road and Paloma Way Road between Mission Boulevard (SR-238) and I-680.

Alameda County Watershed Management Plan
Lands to the south of Niles Canyon Road are within Alameda County, but are under the ownership and jurisdiction of the SFPUC. In April 2001, the SFPUC adopted the Alameda Watershed Management Plan to guide the management of the SFPUC lands for watershed protection.

The Alameda Countywide Transportation Plan
The Alameda Countywide Transportation Plan (CWTP) is a long range policy document that guides transportation funding decisions for Alameda County's transportation system over a 25-year horizon. Approved by the Alameda County Transportation Commission in June 2012, the plan lays out a strategy for meeting transportation needs for all users in Alameda County. The plan includes projects and other improvements for new and existing freeways, local streets and roads, public transit (paratransit, buses, rails, ferries), as well as facilities and programs to support bicycling and walking. The CWTP serves as Alameda County's input to the Metropolitan Transportation Commission (MTC) in the development of the Regional Transportation Plan (RTP).

Plan Bay Area
Plan Bay Area is a state-mandated, integrated long-range transportation, land-use and housing plan that aims to support a growing economy, provide more housing and transportation choices and reduce transportation-related pollution in the nine-county San Francisco Bay Area. Plan Bay Area meets the federal requirements for a RTP.

East Alameda County Conservation Strategy
The East Alameda County Conservation Strategy (EACCS) is a collaborative effort to preserve endangered species by developing and adopting a shared vision to guide long-term habitat protection. The EACCS is funded by Alameda County Community Development Agency, Alameda County Congestion Management Agency, Alameda County Waste Management Authority, the cities of Dublin, Livermore and Pleasanton, East Bay Regional Parks District, Zone 7 ACFCD, and by a CALFED grant obtained by the Alameda County Resource Conservation District. The EACCS assesses areas across east Alameda County for their habitat conservation value and establishes guiding biological principles for conducting conservation in this part of Alameda County. The primary objective of developing this conservation strategy is to reduce project delays and consequently, project costs, while facilitating the conservation of biological resources.

Environmental Consequences
All Build Alternatives
All Build Alternatives are generally consistent with the planning goals and policies that direct the physical development of the area surrounding the project. All Build Alternatives are not globally consistent with the Conservation Element goals of the

EACCS, due largely to the focus of these planning documents on promoting conservation in the face of growth-oriented development and not of the replacement of existing large structures associated with transportation infrastructure. As such, the project does not compromise the goals and policies of planning in ways which are significant. Impacts from all Build Alternatives in relation to the project's consistency with state, regional, and local plans and programs are less than significant.

No-Build Alternative

The No-Build Alternative is not consistent with transportation planning goals set by Plan Bay Area and the Alameda CWTP to provide safe and efficient facilities for East Alameda County.

Table 6 illustrates whether each individual Build Alternative is considered "consistent" or "not consistent" with each of the abovementioned plans/programs and individual policies and goals. A brief explanation justifies each "consistent" or "not consistent" determination.

Table 6. Consistency with State, Regional, and Local Plans and Policies

Policy	Build Alternative 1	Build Alternative 2	Build Alternative 3A	Build Alternative 3B	No-Build Alternative
City of Fremont General Plan Land Use Element/Hill Area Initiative of 2002					
Policy 2-6.2: Hill Area Initiative. Impose more restrictive requirements on Fremont Hill area development than would otherwise apply in designated open space areas.	**Consistent.** All Build Alternatives would realign SR-84 approximately 75 feet from the existing alignment. All Build Alternatives would not physically encroach onto the Hill Face.				**Consistent.** The No-Build Alternative would require no acquisition of land.
Alameda County General Plan					
Conservation Element Goal: To protect and enhance wildlife habitats and natural vegetation areas in Alameda County	**Consistent.** All Build Alternatives involve the removal of a barrier to fish passage. All Build Alternatives would landscape the old section of SR-84 with trees and native vegetation to provide restored habitat in the project vicinity.				**Consistent.** The No-Build Alternative would not impact wildlife habitats and natural vegetation areas in Alameda County.
Conservation Element Goal: To insure and maintain a continuing supply of high water quality for the citizens of Alameda County	**Consistent.** A stream diversion would be proposed as a BMP to avoid impacts to Alameda Creek and ensure water quality is protected during construction activities. Refer to Section 2.2.2 for more detailed information on project impacts on water quality and water quality protection measures.				**Consistent.** The No-Build Alternative would have no impacts to Alameda Creek water quality.

Policy	Build Alternative 1	Build Alternative 2	Build Alternative 3A	Build Alternative 3B	No-Build Alternative
East County Area Plan					
* Policy 1: The County shall identify and maintain a County Urban Growth Boundary that divides areas inside the Boundary, next to existing cities, generally suitable for urban development from areas outside suitable for long-term protection of natural resources, agriculture, public health and safety, and buffers between communities. In accordance with Measure D, the Initiative does not prohibit public facilities or other infrastructure that have no excessive growth-inducing effect on the East County area and have permit conditions to ensure that no service can be provided beyond that consistent with development allowed by the Initiative. *Policy amended in accordance with Measure D: Save Agriculture and Open Space Initiative	**Consistent.** All Build Alternatives require acquisition of land designated as open space for transportation use. All Build Alternatives are consistent with Measure D: Save Agriculture and Open Space Lands Initiative as the construction of all Build Alternatives would have no growth-inducing effect on the East County area and would not expand service beyond the capacity of the existing facility.				**Consistent.** The No-Build Alternative would involve no changes in land use designation.

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
Urban and Rural Development Policy 13: The County shall not provide nor authorize public facilities or other infrastructure in excess of that needed for permissible development consistent with the Initiative. This policy shall not bar 1) new, expanded or replacement infrastructure necessary to create adequate service for the East County, 2) maintenance, repair or improvements of public facilities which do not increase capacity, and 3) infrastructure such as pipelines, canals, and power transmission lines which have no excessive growth-inducing effect on the East County area and have permit conditions to ensure that no service can be provided beyond that consistent with development allowed by the Initiative. "Infrastructure" shall include public facilities, community facilities, and all structures and development necessary to the provision of	**Consistent.** All Build Alternatives would not increase the capacity of SR-84, but would realign a portion of SR-84 to provide a safer transportation infrastructure for East Alameda County.				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
public services and utilities.					
Sensitive Viewsheds Policy 114: The County shall require the use of landscaping in both rural and urban areas to enhance the scenic quality of the area and to screen undesirable views. Choice of plants should be based on compatibility with surrounding vegetation, drought-tolerance, and suitability to site conditions; and in rural areas, habitat value and fire retardance.	**Consistent.** All Build Alternatives would landscape the old section of SR-84 with trees and native vegetation to maintain the scenic quality of the area. Invasive giant reed populations within the project limits would be removed and revegetated with native plants.				**Not Applicable.**
Sensitive Viewsheds Policy 115*: In all cases appropriate building materials, landscaping and screening shall be required to minimize the visual impact of development. Development shall blend with and be subordinate to the environment and character of the area where located, so as to be as unobtrusive as possible and not detract from the natural, open space or visual qualities of the area. To the maximum extent	**Consistent.** The Texas Bridge Railing and ST-70 are proposed as the bridge railing options for all Build Alternatives. At this time, the Texas Bridge Railing is the preferred bridge railing option as this see-through bridge railing minimizes aesthetics/visual impacts while emulating the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives. Regardless of the bridge railing selection, all Build Alternatives are designed to minimize visual/aesthetic impacts. When the proposed project is completed, all Build Alternatives would landscape the old section of SR-84 with trees and native vegetation to maintain the scenic quality of the area and not detract from the natural, open space. Exterior lighting would be shielded to confine direct rays to the travel way.				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
practicable, all exterior lighting must be located, designed and shielded so as to confine direct rays to the parcel where the lighting is located. *Amended in accordance with the adoption of Measure D; Save Agriculture and Open Spaces					
Sensitive Viewsheds Policy 117: The County shall require that where grading is necessary, the off-site visibility of cut and fill slopes and drainage improvements is minimized. Graded slopes shall be designed to simulate natural contours and support vegetation to blend with surrounding undisturbed slopes	**Consistent.** All Build Alternatives propose to design graded slopes to support native vegetation. The old SR-84 alignment would be replanted with native vegetation and trees to minimize impacts to this sensitive viewshed.				**Not applicable.**
Biological Resources Policy 131: The County shall require that roadways be designed to minimize impacts to wildlife corridor and regional trails. Where appropriate, grade-separated crossings and/or other features shall be used to maintain the viability of the affected corridor.	**Consistent.** All Build Alternatives do not impact regional trails and are designed to minimize impacts to wildlife corridors. All Build Alternatives involve the removal of a barrier to fish passage and landscaping of the abandoned section of SR-84 with trees and native vegetation to provide restored habitat in the project vicinity and maintain a high quality wildlife corridor in Niles Canyon.				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
Cultural Resources Policy 137: The County shall require development to be designed to avoid cultural resources or, if avoidance is determined by the County to be infeasible, to include implement appropriate mitigation measures that offset the impacts.	**Consistent.** All Build Alternatives would demolish a local resource, the Alameda Creek Bridge, eligible for listing on the Alameda County Register. As appropriate mitigation, Caltrans will investigate nearby locations that are suitable to place interpretive panels that discuss the history of transportation in Niles Canyon and the Alameda Creek Bridge's role in this history. If Caltrans identifies a suitable location off the highway, interpretive panels will be installed. Caltrans will also prepare a brochure presenting this information to be placed in local libraries and historical societies and will conduct bridge recordation efforts, prior to demolition activities				**Not applicable.**
Transportation Systems Policy 176: The County shall allow development and expansion of transportation facilities (e.g., streets and highways, public transit, bicycle and pedestrian paths, airports, etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the East County Area Plan.	**Consistent.** All Build Alternatives propose to maintain the posted regulatory 45 mph speed limit on SR-84. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Additionally, all Build Alternatives would provide bridge railing that offers structural integrity and eight-foot shoulders that would safely accommodate cyclists on the bridge.				**Not applicable.**
Streets and Highways Policy 192: The County shall work with Caltrans to improve the interstate and state highway systems and the County road system according to the street classifications shown on the	**Consistent.** All Build Alternatives propose to maintain the posted regulatory 45 mph speed limit on SR-84. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Additionally, all Build Alternatives				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
East County Area Plan Transportation Diagram, consistent with Policy 177.	would provide bridge railing that offers structural integrity and eight-foot shoulders that would more safely accommodate cyclists on the bridge				
Scenic Highways Policy 215: The County shall manage development and conservation of land within East County scenic highway corridors to maintain and enhance scenic values.	**Consistent.** The Alameda Creek Bridge Replacement Project proposes to maintain existing scenic value by replanting the abandoned SR-84 alignment with native vegetation and trees. Additionally, the Texas Bridge Railing and ST-70 are proposed as the bridge railing options for all Build Alternatives. At this time, the Texas Bridge Railing is the preferred bridge railing option as this see-through bridge railing minimizes aesthetics/visual impacts while emulating the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives. Regardless of the bridge railing selection, all Build Alternatives are designed to minimize visual/aesthetic impacts.				**Consistent.** The No-Build Alternative involves no changes to the existing highway corridor.
State Scenic Highway Program: Scenic Corridor Protection Plan for Niles Canyon Road and Paloma Way Portion of California State Route 84					
Policy Development 1A: The County of Alameda, City of Fremont, and City of Union City shall explore the development of a subcommittee that will review and provide comment on all private or public development applications within the corridor delineations.	**Consistent.** The Alameda County Scenic Highway Corridor Protection Committee is invited to review and comment on the Alameda Creek Bridge Replacement EIR.				**Not applicable.**
Alameda County Watershed Management Plan					
Water Quality Policy 11: Where new roads or trails are required,	**Consistent.** All Build Alternatives are designed to follow the natural topography of Niles				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
locate and design them to follow natural topography.	Canyon.				
Water Quality Policy 18: Minimize vehicle-related contaminants in runoff from roads, parking lots, facilities, etc.	**Consistent.** Runoff from the roadway pavement for all Build Alternatives would be treated by a stormwater treatment system to remove pollutants. Prior to project's construction, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared with details on how to avoid and to minimize impact to water quality from pollutants generated from construction activities				**Not consistent.** Currently, pollutants from the roadway go into the Alameda Creek directly with no treatment.
Watershed Activities Policy 19: All proposed plans and projects on the Watershed shall be reviewed by San Francisco Public Utilities Commission according to the Review Process for Proposed Plans and Projects.	**Consistent.** SFPUC will be invited to review and comment on the Alameda Creek Bridge Replacement EIR.				**Not applicable.**
Watershed Activities Policy 24: Require that all proposed development involving any grading of land include the submittal of a grading plan to SFPUC to retain the existing topography where feasible.	**Consistent.** SFPUC will be invited to review and comment on the Alameda Creek Bridge Replacement EIR.				**Not applicable.**

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
Alameda Countywide Transportation Plan					
Relevant goals listed in the Alameda Countywide Transportation Plan include providing a transportation system that will be safe and connected across the county, within and across the network of streets, highways and transit, bicycle, and pedestrian routes.	**Consistent.** All Build Alternatives would maintain the regulatory SR-84 speed limit of 45 mph and improve sight distance on the Alameda Creek Bridge. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Additionally, all Build Alternatives would provide bridge railing that offers structural integrity and eight-foot shoulders that would safely accommodate cyclists on the bridge.				**Not consistent.** The No-Build Alternative would not fix transportation deficiencies that exist at this location.
East Alameda County Conservation Strategy (EACCS)					
Goal 2: Maintain and enhance the effective movement and genetic exchange of native organisms within and between natural communities inside and outside the study area.	**Consistent.** All Build Alternatives involve the removal of a barrier to fish passage barrier. All Build Alternatives would landscape the old section of SR-84 with trees and native vegetation to provide restored habitat in the project vicinity.				**Not applicable.**
Goal 6: Protect and enhance functional oak woodland communities (blue oak woodland, valley oak woodland, coast live oak forest and woodland, mixed evergreen forest/oak woodland) to benefit focal species and promote the level of native biodiversity expected to occur within this	**Not consistent**. Build Alternative 1 involves temporary and permanent impacts to approximately 1.6 acres of coastal oak woodland	**Not consistent**. Build Alternative 2 involves temporary and permanent impacts to approximately 1.3 acres of coastal oak woodland	**Not consistent**. Build Alternative 3A involves temporary and permanent impacts to approximately 1.6 acres of coastal oak woodland	**Not consistent**. Build Alternative 3B involves temporary and permanent impacts to approximately 1.9 acres of coastal oak woodland	**Consistent.** The No-Build Alternative would not impact oak woodland communities.

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
natural community in the study area.	communities. Approximately 120 coast live oaks would be impacted. Caltrans plans to mitigate for some tree impacts in the existing SR-84 alignment. *Refer to Tables 22 and 23	communities. Approximately 100 coast live oaks would be impacted. Caltrans plans to mitigate for some tree impacts in the existing SR-84 alignment. *Refer to Tables 22 and 23	communities. Approximately 107 coast live oaks would be impacted. Caltrans plans to mitigate for some tree impacts in the existing SR-84 alignment. *Refer to Tables 22 and 23	communities. Approximately 99 coast live oaks would be impacted. Caltrans plans to mitigate for some tree impacts in the existing SR-84 alignment. *Refer to Tables 22 and 23	
Goal 10: Improve the overall quality of streams and the hydrologic and geomorphic processes that support them to maintain functional aquatic communities, benefiting focal species and promoting native biodiversity.	**Consistent.** All Build Alternatives involve the removal of a concrete weir in Alameda Creek which currently serves as a barrier to fish passage. Removal of this barrier would allow the stream to take on a more natural morphology and would remove a low flow fish passage barrier. Additionally, all Build Alternatives would remove the existing Alameda Creek Bridge's in-stream piers.				**Not consistent.** The No-Build Alternative would not remove the concrete weir from Alameda Creek. Alameda Creek would maintain its existing morphology and the weir would continue to serve as a fish passage barrier in Alameda Creek.

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
Goal 16 Increase the Alameda whipsnake population in the designated recovery units in the study area to a level that allows for long-term viability without human intervention. Objective 16.1. Avoid and minimize direct impacts on Alameda whipsnake (mortality of individuals and loss of habitat) during project construction and indirect impacts that result from post project activities by implementing avoidance measures.	**Not consistent.** Build Alternative 1 involves temporary and permanent impacts to 2.0 acres of critical habitat for Alameda whipsnake. Caltrans will mitigate for these impacts but the majority of the mitigation will be accomplished off site.	**Not consistent.** Build Alternative 2 involves temporary and permanent impacts to 1.2 acres of critical habitat for Alameda whipsnake. Caltrans will mitigate for these impacts but the majority of the mitigation will be accomplished off site.	**Not consistent.** Build Alternative 3A involves temporary and permanent impacts to 1.4 acres of critical habitat for Alameda whipsnake. Caltrans will mitigate for these impacts but the majority of the mitigation will be accomplished off site.	**Not consistent.** Build Alternative 3B involves temporary and permanent impacts to 1.4 acres of critical habitat for Alameda whipsnake. Caltrans will mitigate for these impacts but the majority of the mitigation will be accomplished off site.	**Consistent.** The No-Build Alternative would not impact Alameda whipsnake populations.
Goal 22: Increase the central California coast steelhead distinct population segment by enhancing and providing access to habitat in the study area. Specifically including: Objective 22.1. Avoid and minimize direct impacts on potential steelhead habitat during project construction and indirect impacts that result from	**Consistent.** All Build Alternatives involve the removal of a concrete weir in Alameda Creek which currently serves as a barrier to fish passage. Removal of this barrier would allow the stream to take on a more natural morphology and would remove a low flow fish passage barrier.				**Not consistent.** The No-Build Alternative would not remove the concrete weir from Alameda Creek. Alameda Creek would maintain its existing

Policy	**Build Alternative 1**	**Build Alternative 2**	**Build Alternative 3A**	**Build Alternative 3B**	**No-Build Alternative**
post project activities by implementing avoidance measures. Objective 22.3. Support existing efforts to remove/modify fish barriers in the Alameda Creek watershed to enable access to a wide variety of streams and habitats in the study area. Objective 22.4. Ensure that all new road crossings and crossing upgrades in areas of steelhead habitat are designed to facilitate passage of adult and juvenile steelhead.					morphology and the weir would continue to serve as a fish passage barrier in Alameda Creek.
One Plan Bay Area					
Required Performance Target: Reduce Injuries and Fatalities from Collisions. This target reflects an emphasis in Plan Bay Area to enhance safety for all travel modes across the Bay Area. This target is adapted from the state's Strategic Highway Safety Plan (2006), and also reflects a long-standing regional goal of making streets, highways, and transit service safer.	**Consistent.** All Build Alternatives would maintain the regulatory SR-84 speed limit of 45 mph and improve sight distance on the Alameda Creek Bridge. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Additionally, all Build Alternatives would provide bridge railing that offers structural integrity and eight-foot shoulders that would safely accommodate cyclists on the bridge.				**Not consistent.** The No-Build Alternative would not fix transportation deficiencies that exist at this location.

2.1.1.3 Parks and Recreational Facilities

Affected Environment

Potential parks and recreational facilities identified within 0.5 miles of the project area include the Stony Brook Park and the historic Niles Canyon Railway. In addition to these potential parks and recreational facilities, the East Bay Regional Parks District (EBRPD) is currently in the early planning phases of constructing a Class 1 bicycle trail through the Niles Canyon corridor. These potential parks and recreational facilities are discussed in further detail below.

Stony Brook Park: The Stony Brook Park served as one of several picnic parks located in the Niles Canyon corridor during the 1900-1960's. Although the Stony Brook Park historically served as a recreation area for the public, the area is currently closed and no public access to the area is provided. For this analysis, the Stony Brook Park is not considered a park and recreational facility because no public access is provided.

Niles Canyon Railway: The second parks and recreational facility identified within 0.5 miles of the project area is the Niles Canyon Railway. The Niles Canyon Railway operates along a portion of the first Transcontinental Railroad; this railway is listed on the National Register of Historic Places (NRHP) as the Niles Canyon Transcontinental Railroad (NCTR). The Pacific Locomotive Association (PLA) operates the Niles Canyon Railroad as a living history museum to increase public education, enjoyment, and appreciation of the American railroads (Niles Canyon Railway, 2014). In 1987, the PLA entered into an agreement with the county and began building the rail line. Since 1987, the Niles Canyon Railway has provided recreational train rides to the public year round between Sunol and the town of Niles in Fremont.

Niles Canyon Class 1 Bicycle Trail: The EBRPD, in cooperation with Alameda County, ACWD, SFPUC, Caltrans, the Altamont Corridor Express, and the PLA, is interested in completing an extension of the East Bay trail system through the Niles Canyon corridor. The EBRPD is currently studying the feasibility of constructing a paved, Class 1 bicycle trail from Mission Boulevard (SR-238) in Fremont to the town of Sunol. Potential alignments for the proposed trail and preliminary engineering and design plans are in development and are expected in early 2015. The proposed extension would connect to the existing Alameda Creek Regional Trail. Caltrans is participating on the multi-agency development team for the creation/extension of this bicycle trail system through the Niles Canyon corridor.

Environmental Consequences

All Build Alternatives

Stony Brook Park, the Niles Canyon Railway, and EBRPD's future Niles Canyon Class 1 bicycle trail were all identified as potential parks and recreational facilities located within 0.5 miles of the project vicinity. As discussed in further detail below, all Build Alternatives would not impact parks and recreational facilities.

Stony Brook Park: Stony Brook Park was identified as a potential parks and recreational facility within 0.5 miles of the project vicinity. Further research indicated that Stony Brook Park is not a park and recreational facility because no public access is provided. Therefore, Stony Brook Park is not considered a park and recreational facility for this analysis.

Niles Canyon Railway: All Build Alternatives have no direct impacts to the Niles Canyon Railway. Indirect impacts to the railway include temporarily increased noise levels from project construction and demolition. Impacts associated with temporary noise levels are anticipated to be negligible as passengers on the train would have limited exposure to the area due to the speed of the train. Similarly, indirect visual impacts are expected to be negligible given the limited exposure of viewers to the proposed project. Views of the project vicinity from the train are seen at a distance and filtered by dense vegetation. Duration of visual impacts is short due to the speed of the train through the project vicinity.

Niles Canyon Class 1 Bicycle Trail: The EBRPD is still in the preliminary stages of studying and planning for the Niles Canyon Class 1 bicycle trail. Caltrans is participant in EBRPD's multi-agency Niles Canyon Trail development team. Participation will achieve coordination and synchronization between the Caltrans' Alameda Creek Bridge Replacement Project and the proposed Niles Canyon bicycle trail project. While the design path of the trail has not been finalized, a safer crossing of Alameda Creek for cyclists and pedestrians would be provided by this project and could be incorporated into the design of the Niles Canyon Class 1 bicycle trail. Environmental consequences of the Alameda Creek Bridge on the proposed bicycle trail through the Niles Canyon corridor are negligible given the interagency coordination and communication.

All Build Alternatives would have no impact on existing parks and recreational facilities.

No-Build Alternative
The No-Build Alternative would have no impact to parks and recreational facilities.

Avoidance, Minimization, and/or Mitigation Measures
PARKS/REC-1. Caltrans will continue to participate in EBRPD's multi-agency development team for the future Niles Canyon Class 1 bicycle trail.

2.1.2 Utilities/Emergency Services

2.1.2.1 Affected Environment

Power and telecommunication utilities are located within the project vicinity. Pacific Gas & Electric (PG&E) provides gas and electricity service and American Telephone & Telegraph Company (AT&T) provides telecommunication service through the project area. No water or sewer utilities are located in the project vicinity.

2.1.2.2 Environmental Consequences

All Build Alternatives

No relocations or direct impacts to sewer and water utilities are expected as a result of the Alameda Creek Bridge Replacement Project. Two PG&E utility poles are located within the project vicinity and would be relocated to accommodate the realignment of SR-84 and the construction of a new Alameda Creek Bridge. AT&T also uses these two utility poles to provide telecommunication service through the area. There would be no temporary or long-term impacts to electricity or telecommunication services from the relocation of the power poles. Coordination efforts with PG&E would continue through final project design and construction.

SR-84 would remain open during the construction of the new bridge and alignment approaches. For the construction of all Build Alternatives, the roadway would be temporarily shifted towards the cut slope. Short-term lane closures would be necessary to facilitate construction. These short-term lane closures would occur on the weekends and during off-peak hours as to not affect peak-hour traffic (between 6 am - 10 am and 3 pm – 7pm) during the weekdays. No law enforcement, fire, and/or emergency services would be affected by the proposed construction and demolition activities as access to SR-84 would not be permanently altered by the project. Impacts to utilities/emergency services would be less than significant.

No-Build Alternative

The No-Build Alternative would not change existing conditions and would not impact any utilities/emergency services.

2.1.2.3 Avoidance, Minimization, and/or Mitigation Measures

UTL-1. Power lines will be relocated to avoid affecting power service.

2.1.3 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.3.1 Regulatory Setting

Caltrans directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of highway projects. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

2.1.3.2 Affected Environment

The study area established for traffic and transportation/pedestrian and bicycle facilities analysis is SR-84 between postmile 13.0 and postmile 13.6. The Niles Canyon corridor is characterized as a two lane conventional highway that leaves the urbanized setting of Fremont and transitions into a rural setting east of Mission Boulevard (SR-238). The roadway is generally bounded by a steep canyon wall, the Alameda Creek, and the historic Niles Canyon Railway.

The Caltrans Highway Design Manual recommends that the design speed for any section of roadway be a constant value for safe and efficient operation (Caltrans, 2014b). This

promotes safety by reducing opportunities for inattentive drivers to fail to slow down in response to more restrictive roadway conditions.

The regulatory speed limit on the Niles Canyon section of SR-84 is 45 mph, as identified by the black figure on white regulatory speed limit signs. However, advisory signage at some curve locations in Niles Canyon recommends lower speeds as identified by the black figures on yellow. The roadway has narrow shoulders with generally curvilinear horizontal alignment; the eastern portion is less curvilinear with more open roadside and generally flatter sideslopes.

Traffic and Transportation: Caltrans' conducted a Road Safety Analysis study using Value Analysis/Explicit Road Safety processes and techniques on SR-84 between postmiles 10.8 – 18.0 in August 2012. Using collision data supplied by Caltrans (from November 2007 to September 2010), the Road Safety Analysis identified five locations within the SR-84 corridor between Mission Boulevard (SR-238) and I-680 with safety needs. The Alameda Creek Bridge was identified as a location in Niles Canyon with unmet safety needs.

Prior to the Road Safety Analysis, Caltrans conducted a separate traffic study focusing on the Alameda Creek Bridge Project vicinity. Accident data from a ten year period (collected from January 2002 to December 2011) indicates there were a total of 23 collisions reported from postmile 13.2 to postmile 13.6 (Caltrans, 2014c). Collisions in the vicinity of the Alameda Creek Bridge structure include head-on, run-off-the-road, hit-object, and cross-into-opposite lane type accidents. As described in the project objectives and purpose in Section 1.2, the collision rate for fatal and injury collisions between postmiles 13.0 and 13.6 exceeds the state-wide average and total collision rates exceed the state-wide average. Caltrans re-evaluated the previous traffic data in 2014 and recommended realigning the roadway with increased curve radii at the northern and southern approaches at the Alameda Creek Bridge and widening shoulders on both sides of the bridge and its approaches (Caltrans, 2014c). These measures would improve sight distance and clear recovery area, and provide refuge for errant vehicles that might otherwise cross the centerline or run off the roadway.

Niles Canyon two-way average annual daily traffic (AADT) is forecast to grow to 22,500 in the vicinity of Palomares Road by the year 2030 (Caltrans, 2012). The following table identifies two-way traffic volumes on SR-84 between postmile 10.8 to postmile 18.0 in the year 2013.

Table 7. Two way traffic volumes on SR-84 between postmiles 10.8 and 18.0 in 2013

Postmile	Location	Ahead AADT
10.8	Fremont, Junction Route 238	14,100
13	Palomares Road	12,600
17.3	Sunol, Pleasanton/Sunol Roads	6,700
18.0	Junction, Route 680	27,500

Pedestrian/Bicycle Facilities: SR-84, between Mission Boulevard (SR 238) and I-680, is a popular location for cyclists. While this location is popular, it is also intimidating for cyclists to use because of the narrow shoulders. Using 2002 as a baseline year, cycling has gone up 75% in Alameda County (Campbell, 2014). This trend indicates that cycling will continue to grow in popularity in Alameda County.

In cooperation with Alameda County, the ACWD, the SFPUC, Caltrans, the Altamont Corridor Express and the PLA, EBRPD is currently in the planning stages to determine the feasibility of implementing a Class 1 bicycle trail through the Niles Canyon corridor from Mission Boulevard (SR-238) in Fremont to the town of Sunol. Potential alignments for the proposed trail and preliminary engineering and design plans are in development and expected early 2015. The proposed extension would connect to the existing Alameda Creek Regional Trail.

2.1.3.3 Environmental Consequences

All Build Alternatives

All Build Alternatives would improve sight distance, provide standard eight-foot shoulders, and a bridge railing that meets standard bridge rail design on a 0.6 mile segment of SR-84. All Build Alternatives would maintain the regulatory 45 mph speed limit for this section of SR-84 and improve sight distance on the Alameda Creek Bridge. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Environmental consequences of the Build Alternatives are discussed in terms of construction impacts and operational impacts.

Construction Impacts

All Build Alternatives would require stage construction plans, construction area sign plans, and a TMP. The TMP for use during construction involves the use of the following: portable changeable message signs, ground mounted signs, detour maps, and bicycle community information. The TMP would be implemented during construction to minimize and prevent delays and inconveniences to the traveling public. The TMP would include public information through the use of brochures, mailers, and press release. Press

release would notify motorists, businesses, community groups, local entities, emergency services, and politicians of upcoming closures or detours.

For the construction of all Build Alternatives, the roadway would be temporarily shifted towards the cut slope. Short-term lane closures would be necessary to facilitate construction. These short-term lane closures would occur on the weekends and during off-peak hours as to not affect peak-hour traffic (between 6 am - 10 am and 3 pm -7 pm) during the weekdays. Similar to vehicular traffic, cyclists would experience a delay in Level of Service during the temporary lane closures. The proposed project is located in a rural part of Alameda County; no businesses are located in the surrounding area and no economic impacts to businesses are expected as a result of the proposed project. Impacts to traffic and transportation as a result of construction activities are less than significant.

Operational Impacts

All Build Alternatives propose to realign SR-84 by increasing the curve radii at the eastern and western approaches and at the Alameda Creek Bridge. Additionally, all Build Alternatives propose eight-foot shoulders on the new Alameda Creek Bridge and the bridge approaches to bring the facility up to current design standards. The larger radius of the curve would improve sight distance and reduce the numbers of errant vehicles that might otherwise cross the centerline or run off the roadway. These safety improvements would result in the removal of the existing speed advisory signs (black figures on yellow, as opposed to the black-figure-on-white regulatory-speed-limit signs) that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit.

There would also be safety and operational benefits from having a longer stretch of roadway with a consistent design speed (extending from approximately the curve east of the Palomares intersection in the west to the low-speed-curve, just west of the Fremont border to the east). The proposed project would result in improved sight distance and a clear recovery area while also providing eight-foot shoulders on either side of the bridge to accommodate stopped vehicles, emergency usage, cyclists, and errant vehicles recovery. The proposed project has no impact to traffic safety as the all Build Alternatives are designed to maintain the 45 mph regulatory speed limit of this section of SR-84. No traffic and transportation impacts on SR-84 are anticipated as a result of replacing the Alameda Creek Bridge and realigning the eastern and western approaches to the bridge as the project will maintain the existing 45 mph regulatory speed on this 0.6 mile section of SR-84.

The proposed project would have no impact to existing pedestrian and bicycle facilities, but would improve a 0.6 mile stretch of SR-84 for cyclist usage. The current facility does not provide any shoulder or refuge for cyclists; all Build Alternatives would provide standard eight-foot shoulders. All Build Alternatives would improve safety for cyclists by providing eight-foot shoulders on the Alameda Creek Bridge and newly realigned approaches leading up to the bridge.

No-Build Alternative

The No-Build Alternative would not change existing conditions and transportation deficiencies would remain unaddressed.

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

TRAFFIC-1. A TMP will be prepared during the detailed design phase for the selected Build Alternative and implemented prior to the construction of the project. The plan will be prepared in accordance with Caltrans requirements and guidelines and will address traffic impacts from staged construction and specific traffic handling concerns during the construction of the project. Implementing the TMP will involve the dissemination of press releases, and other documents to adequately notify and inform motorists, community groups, local entities, emergency services, and elected official of upcoming road construction activities. This responsibility includes advance notification to local newspapers, television and radio stations, and emergency response providers. Caltrans construction staff will also submit weekly information regarding the traffic impacts to SR-84 to the Caltrans District 4 Public Information Office. This information will be included in the Weekly Traffic Update, which Caltrans disperses to news media outlets and other interested agencies.

2.1.4 Visual/Aesthetics

2.1.4.1 Regulatory Setting

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

2.1.4.2 Affected Environment

Assessment Method

A Visual Impact Assessment (VIA) for the Alameda Creek Bridge Replacement (Caltrans, 2014d) was completed in accordance with Visual Impact Assessment for Highway Projects. The VIA documents potential visual impacts caused by the proposed Alameda Creek Bridge Replacement Project and proposes measures to lessen impacts.

Project Location and Setting

The project is located in Niles Canyon, an east-west canyon formed by Alameda Creek, the largest creek in the San Francisco East Bay region. The canyon is a part of the Diablo Range, a portion of the Pacific Coast Mountain Range that encloses the eastern shore of the San Francisco Bay to the west of the project area. In 2007, SR-84 between Mission Boulevard (SR-238) and I-680 was designated a State Scenic Highway, reflecting its exceptional scenic resources.

Visual resources of the project setting are defined and identified below by assessing existing visual character and visual quality in the project corridor.

Visual Assessment Units and Key Views

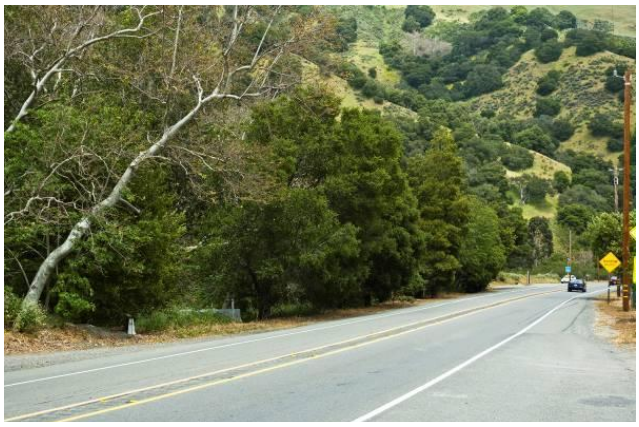
Landscape units are geographically discrete areas that are often separated by natural features such as bodies of water, ridges, or changes in vegetation. The Alameda Creek Bridge Replacement Project is situated entirely within a single visual assessment unit, Niles Canyon. The Niles Canyon visual assessment unit consists of a narrow, very steep canyon, following Alameda Creek between the city of Fremont and the town of Sunol, and encompassing the entire project limits. Within the immediate project vicinity, the setting includes high, steep hillsides of dense oak-evergreen woodland to the south and west of the project. To the south and east of the immediate project vicinity is the Alameda Creek and its associated riparian woodland. High, steep live oak-grassland hillsides are located to the north and east of the immediate project vicinity. Five keys viewpoints were selected, three viewpoints from the road and two viewpoints from the Niles Canyon Railway, to represent potential project impacts, as discussed in Section 2.1.4.3 Environmental Consequences.

Figure 3. Visual Assessment Unit – This map delineates the project setting and associated key views that will be used to assess visual impacts caused by the proposed project

These Key Viewpoints are as follows:

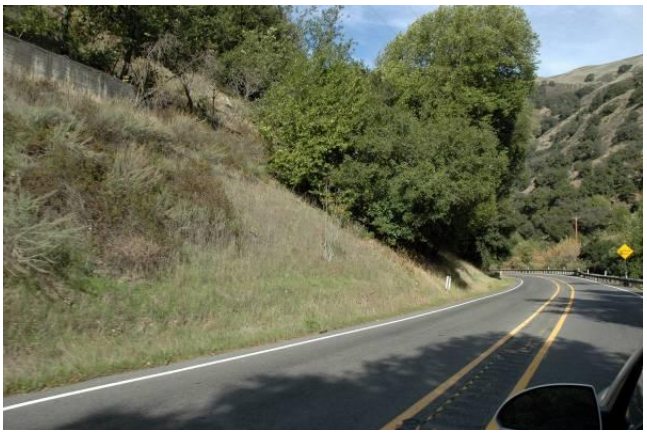
Views from the Road

Key Viewpoint 1: Existing View of Eastbound Approach from Western Project Terminus, looking east.



Key Viewpoint 2: Existing Eastbound View of Proposed Alameda Creek Bridge looking east.

Key Viewpoint 3: Existing Westbound View Approaching Alameda Creek Bridge from the east.



Views to the Road (from Niles Canyon Railway)

Key Viewpoint 4: Existing View of Proposed Alameda Creek Bridge from Niles Canyon Railway, looking west

Key Viewpoint 5: Existing View of State Route 84 and Niles Canyon Aqueduct from Niles Canyon Railway, looking west across Alameda Creek

Visual Resource of the Project Setting

Visual Character

Visual character includes attributes such as form, line, color, texture, and is used to describe, not evaluate, these attributes. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character can be identified by how visually compatible a proposed project would be with the existing condition by using visual character attributes as an indicator. These include such descriptors as:

- Form – visual mass and shape
- Line – edges or linear definition
- Color – reflective brightness and hue
- Texture – surface coarseness
- Dominance – position, size, or contrast
- Scale – apparent size as it relates to the surroundings

- Diversity – a variety of visual patterns
- Continuity – uninterrupted flow of form, line, color, and texture

These formal attributes and the project-related changes to them help to describe the overall visual character of the setting, and the project's compatibility with it.

Alameda Creek and the extremely steep surrounding slopes of Niles Canyon define the project's physical and visual setting. The creek directly adjoins the entire length of the project, passing beneath the existing and proposed bridges. The eastern edge of the project roadway segment, beyond the bridge from postmile 13.0 to postmile 13.6, is currently characterized by extensive riparian tree canopy, including oak, maple, sycamore, and bay. The creek is briefly visible from the existing bridge and portions of the affected project roadway segment, providing motorists with an attractive scenic feature of open water and tall, dense adjoining riparian forest. Tree canopy, both riparian forests along the creek/canyon bottom, as well as dense oak woodland on the steep canyon slopes, dominates views throughout the project viewshed. Fleeting views of open grassland amid stands of oak woodland are also intermittently visible on steep slopes above the roadway, changing from green to golden depending upon season. Form, color and texture of the existing setting are typical of a forested natural setting, characterized by a continuous unified, green leaf canopy often extending above the viewer, and dominating the visual setting generally. Steep canyon slopes are also dominated by vegetation. Geometric man-made forms such as the existing bridge and roadway are very subordinate in both scale and dominance to the natural forms of the surrounding setting.

Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the project corridor[1]. The three criteria for evaluating visual quality are defined below:

- *Vividness* is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.

- *Intactness* is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.

- *Unity* is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

All key viewpoints used in this analysis and described above are located within the same small area of the Niles Canyon landscape unit and share a common visual character and visual quality. Visual character comprises very steep canyon slopes and dense tree canopy, often enclosing the roadway overhead. This natural setting, minimally affected within the last 50 years, visually dominates the man-made character of the existing

[1] Terms and methods used here derive from *Visual Impact Assessment for Highway Projects* (FHWA-HI-88-054), available at http://www.dot.ca.gov/ser/downloads/visual/FHWAVisualImpactAssmt.pdf

roadway. Visual quality of all key viewpoints, all of the project viewshed, and the entire Niles Canyon is high.

Viewers and Viewer Response

The population affected by the project is composed of viewers. Viewers are people whose views of the landscape may be altered by the proposed project—either because the landscape itself has changed or their perception of the landscape has changed.

Types of Viewers

There are two major types of viewer groups for highway projects: highway neighbors and highway users. Each viewer group has their own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group which help to predict their responses to visual changes.

HIGHWAY USERS (VIEWS FROM THE ROAD)

Representative views from the road are depicted in Key Viewpoints 1, 2, and 3. The principal highway viewer group comprises motorists traveling in the corridor for a variety of reasons, including commuting, recreational sight-seeing and work-related travel. Bicyclists also use this corridor.

HIGHWAY NEIGHBORS (VIEWS TO THE ROAD)

Representative views to the road are depicted in Key Viewpoints 4 and 5. The principal sensitive off-road group with views of the project would be passengers on the recreational Niles Canyon Railway. No residences or other permanent uses adjoin the immediate project viewshed and there are no nearby public recreational trails, so there is an absence of other sensitive off-road viewer groups. Recreational use of Alameda Creek by boaters and swimmers is minimal due to an absence of accessible access points; such use in the project vicinity is not officially permitted.

2.1.4.3 Environmental Consequences

Change to the Project Setting

The visual character of the proposed Alameda Creek Bridge Replacement Project would be moderately compatible with the existing visual character of the corridor. Similar to the existing bridge, the bridge structure's curvilinear form would echo the curving topographic form of the surrounding canyon. The new bridge would not detract from the strong dominance of the existing forest canopy due to its small visual scale in relation to the overall landscape setting. The uphill grading, cut slopes, retaining walls and anchored wire mesh above the viaduct to the east of the bridge would contrast more strongly with the existing vegetated setting in form, color, and texture, and introduce a clashing element of man-made character for that segment of the roadway.

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. Table 8 provides a reference for determining levels of visual impact by combining resource change and viewer response.

Table 8. Visual Impact Ratings Using Viewer Response and Resource Change

		Viewer Response (VR)				
		Low (L)	Moderate-Low (ML)	Moderate (M)	Moderate-High (MH)	High (H)
Resource Change (RC)	Low (L)	L	ML	ML	M	M
	Moderate-Low (ML)	ML	ML	M	M	MH
	Moderate (M)	ML	M	M	MH	MH
	Moderate-High (MH)	M	M	MH	MH	H
	High (H)	M	MH	MH	H	H

The overall resource change of the Build Alternatives would be generally moderate, except for Build Alternative 1, which could remain substantial. Change to visual character would be generally moderate, except for Build Alternative 1, which would remain visually dominant. For Build Alternatives 2, 3A and 3B, changes to visual character would remain subordinate in scale and dominance to the surrounding natural setting.

The visual quality of the existing corridor would be altered by Build Alternatives 2, 3A and 3B, but to a limited degree and extent. Under Build Alternative 1, visual quality would decline to a moderate to moderately high degree.

Visual Impacts by Visual Assessment and Build Alternative

All four Build Alternatives affect a short segment of roadway (approximately 2,350 feet to 3,000 feet), include replacement box-girder bridges of similar length (410 feet to 500 feet) and follow similar alignments that differ by only a few feet. Visually, the box-girder bridge structure under all Build Alternatives, despite minor differences in length, would be essentially the same.

All Build Alternatives would involve road widening to accommodate desired safety improvements, including travel lane and shoulder widening, addition of a soft median (suitable for a rumble strip), and curve adjustments. West of the replacement bridge, all four Build Alternatives would include a new alignment on earth embankment, located slightly north of the existing highway. Despite minor differences among the four Build Alternatives in the length, alignment, and detail of this western approach section, the resulting differences in the visual experience of motorists and Niles Canyon Railway passengers would be minor and inconsequential.

To the east (south) of the replacement bridge, this widening would extend east of the existing roadway toward Alameda Creek. Differences in horizontal alignment in that section east (south) of the bridge account for the principal visual differences among the

Build Alternatives, due to differences in the type of support structures and amount of visible uphill grading and wall construction required. Under Build Alternatives 1 and 2, widening of this eastern section would be supported by downhill retaining walls adjoining the creek. Under Build Alternatives 3A and 3B, this section would be supported by sidehill viaduct structures supported by concrete columns. From a visual standpoint, however, the differences in the downhill support structures would be of secondary importance, since their visibility to sensitive viewers, particularly on the Niles Canyon Railway, is expected to be minimal.

The primary visual difference among the four Build Alternatives would be due to the different proposed uphill slope treatments, heights and lengths.

Niles Canyon Visual Assessment Unit

Views from the Road (KVPs 1-3)

KEY VIEWPOINT (KVP-1) – View of Eastbound Approach from Western Project Terminus, Looking East (Figures 4 and 5)

KVP-1: Existing Condition

All key viewpoints are located within the same small area of the Niles Canyon landscape unit and share a common existing visual character and visual quality. Visual character of the project's viewshed comprises very steep canyon slopes and dense tree canopy, often enclosing the roadway overhead. This largely undisturbed natural setting visually dominates the man-made character of the existing roadway. Visual quality of all of the project viewshed, and of Niles Canyon as a whole, is high.

Viewer Response

Viewpoint KVP-1 is representative of the view of motorists in the western section of the project. Viewer sensitivity of the two principal viewer groups, motorists and Niles Canyon Railway passengers, is generally high in both cases. Viewer exposure of motorists to the project features is also generally high; however, viewer exposure to particular segments and features of the proposed project, as represented in the simulation viewpoints, is moderated in each case by the very short duration of exposure. In the case of viewpoint KVP-1, that duration would be approximately 20 to 30 seconds of viewer exposure to the western approach and embankment at 45 mph. Accounting for the duration of view, exposure of motorists is moderate. Viewer exposure of Niles Canyon Railway passengers is generally moderately low, due to limitations of visibility from dense intervening riparian vegetation. However, under Build Alternative 1, the limit of tree removal north of the new highway would move near the Niles Canyon Railway, possibly to the point of reducing existing screening and increasing views to the road from the Niles Canyon Railway. Viewer exposure of Niles Canyon Railway passengers in the western section of the project could potentially increase to a moderate level under Build Alternative 1.

Under Build Alternative 1, overall viewer response for viewpoint KVP-1 is considered moderately high for motorists, and moderately high for Niles Canyon Railway passengers.

KVP-1: Proposed Condition – (Build Alternative 1)
Resource Change
As shown in Figure 4 (KVP-1: Existing View) and Figure 5 (KVP-1: Simulated View), the roadway alignment to the west of the replacement bridge would move northward from the existing alignment. From the northern edge of the bridge structure to the western conform with the existing alignment, a 1,400-foot fill embankment would raise the roadway profile by up to approximately 16 feet. Along the new alignment, the embankment would extend south up to 40 feet from the proposed new eastbound edge of pavement (a 4:1 embankment slope), and to the north up to 20 feet from the proposed new westbound edge of pavement (a 2:1 embankment slope). The maximum width of the embankment would be 80 feet. The existing roadway paving would be removed and revegetated.

Similarly, the new embankment would be hydroseeded with native and erosion control species, establishing a rural, vegetated visual character consistent with the adjoining setting. The proposed 16-foot embankment would not represent a major alteration of existing landform and would be unobtrusive as seen from the highway. Substantial tree removal would take place to the north of the existing highway to make way for the new alignment, including mature native oaks, sycamore and non-native trees. However, as depicted in Figure 5 (KVP-1 Simulated View), the removal of these trees would simply expose other, existing mature native trees behind them, retaining substantially similar visual character as before, as seen from the highway.

For motorists, vividness, intactness, and unity of the scene in this western approach segment would remain substantially as they are. The overall change in visual character and quality as a result of tree removal and addition of the embankment would be moderately low to low. In the context of moderately high motorist viewer response, this would be a moderate impact. Exposure of views from the roadway to the hillside to the north could increase somewhat, with a neutral or beneficial visual effect.

Currently, the area to the south creek-side adjacent to the existing roadway is not heavily vegetated with trees. After construction, existing paving of the old roadway would be removed, and this area would be revegetated. The extent of tree canopy would increase in the long term, a beneficial effect.

By its realignment northward, the new western approach would move closer to the Niles Canyon Railway. Under Build Alternative 1, the north (WB) side of the new approach embankment would include a 4:1 side-slope. This would require tree removal and re-grading close to the Niles Canyon Railway, reducing the width of the visual buffer of trees between the rail line and realigned roadway. As a result of this tree removal, the amount of screening canopy between the Niles Canyon Railway and the roadway would decrease, and it is likely that visibility of the highway from the Niles Canyon Railway could increase in this section. If visibility of the highway from the Niles Canyon Railway does increase due to project tree removal, visual quality and character would both be adversely affected. As seen from the Niles Canyon Railway, vividness, intactness, and unity could all decline to a moderate degree, and visual character would be moderately

affected by the change to a less natural setting although these effects would be brief and fleeting at normal operating speeds. Nevertheless, overall this is considered a potentially moderate adverse visual change. In the context of moderately high viewer response of Niles Canyon Railway passengers, this could, without mitigation, be a moderately high, potentially adverse impact.

With recommended mitigation measures as described in Section 2.1.4.4, Build Alternative 1, including dense tree re-planting and revegetation on the north-facing berm of the western approach, visibility of the road could be blocked in the long term, reducing viewer exposure and visual change to a minimal level. Guard-rail would be required on the north (westbound) side of the highway to apply this measure. Alternatively, or in addition to that measure, implementation of a 2:1 side-slope to the north of the embankment could reduce tree removal, avoiding impacts described above. With either of these measures, reduction of existing tree screening could be minimized, and impacts to Niles Canyon Railway viewers would be reduced to a moderate, less-than-significant level in the long term.

KVP-1: Proposed Condition – (Build Alternatives 2, 3A, and 3B)
Resource Change
Similar to Build Alternative 1, Build Alternatives 2, 3A, and 3B would include a new alignment on earth embankment, located slightly north of the existing highway, in the section west (north) of the replacement bridge. Build Alternatives 2, 3A, and 3B share roughly the same horizontal alignment in this section, slightly south of the Build Alternative 1 alignment and nearer to the existing alignment. Embankments under all four Build Alternatives would be identical in length (1,400 feet).

Under Build Alternatives 2, 3A, and 3B, potential visual effects to motorists in the western approach section depicted in KVP-1 would be substantially similar to those described for Build Alternative 1, above. Effects on visual character and quality would remain moderately low to low, and overall adverse impact would be moderate. As seen from the road, differences among the four Build Alternatives in the length, alignment, and detail of this western approach section would be minor and inconsequential. For this reason, simulations of the four Build Alternatives from KVP-1 were not considered useful or necessary, and all four are represented by Figure 5.

Effects on Niles Canyon Railway viewers of Build Alternatives 2, 3A, and 3B in the western embankment section would be less than under Build Alternative 1. Because the alignment of Build Alternatives 2, 3A, and 3B would be farther south than Build Alternative 1, they would encroach on existing trees to the south of the Niles Canyon Railway tracks to a minimal degree. Build Alternative 2 would include an 850-foot retaining wall of between four feet and 20 feet in height to support the north side of the embankment. The wall would not be visible to motorists, and mostly or entirely filtered from the view of Niles Canyon Railway passengers by dense existing trees and shrubs. The wall would have little or no visual effect.

Build Alternatives 3A and 3B would have 2:1 soil side-slopes to the north, reducing the amount of tree removal needed on that side to a minimal level. Visibility of the road from the Niles Canyon Railway would remain minimal as it is now, and overall resource change would be moderately low. In the context of moderately high viewer response of Niles Canyon Railway passengers, this would represent a moderate, less-than-significant impact. As a result, the view from the Niles Canyon Railway to the western approach section was not simulated.

Figure 4. KVP-1: Existing View

Figure 5. KVP-1: Simulated View

Key View Point (KVP-2) – Eastbound View of Existing and Proposed Bridge Looking East (Figures 6, 7, 8, and 9)

KVP-2: Existing Condition
The visual character and quality of all viewpoints is the same and described above in the existing condition for KVP-1. Visual quality of all key highpoints is high.

Viewer Response
Viewer exposure of motorists to the project roadway and bridge is generally high; however, viewer exposure to particular segments and features of the proposed project, as represented in the simulation viewpoints, is moderated in each case by very short duration of exposure. In the case of viewpoint KVP-2, the bridge would be visible to eastbound motorists at distances of up to 500 feet or more, for an overall view duration of roughly nine seconds or less. Bridge design detail would only be evident at immediate foreground distances, on or very near the bridge. For westbound motorists, the bridge would only come into view moments before entering the bridge. Accounting for the very short duration of view, exposure of motorists to the bridge is moderate overall. Viewer exposure of Niles Canyon Railway passengers is generally moderately low to low, due to limitations of visibility from dense intervening riparian vegetation. However, under Build Alternative 1, the limit of tree removal north of the new western roadway embankment would move near the Niles Canyon Railway, possibly to the point of reducing existing screening and increasing views to the road from the Niles Canyon Railway. Viewer exposure of Niles Canyon Railway passengers in the western section of the project could increase to a moderate level under Build Alternative 1.

Under Build Alternative 1, overall viewer response for viewpoint KVP-2 is considered moderately high for motorists, and moderately high for Niles Canyon Railway passengers.

KVP-2: Proposed Condition – (Build Alternative 1)
Resource Change– (Build Alternative 1)
As depicted in Figures 7, 8, and 9 (KVP-2 Simulated View of proposed replacement bridge (All Build Alternatives)), the change in visual character and quality of views of the replacement bridge from the eastbound approach would be minor. The new bridge would be of slightly increased scale, but this change in the degree of visual dominance would be minor. The scale of the new bridge and its relationship to the immediate surroundings would be substantially similar. The alignment would be altered slightly, but after construction, removal of the existing bridge, and a short period of vegetation establishment, the overall character of the new bridge and its immediate setting would appear substantially similar to the existing condition.

Both existing and proposed bridges are similar in form, with no overhead suspension structure, and similar in general character. The visual character of the bridge structure as seen on the bridge would be affected by the railing type selected. The existing bridge includes a concrete see-through rail design that conveys its period character (1928). As discussed above, two bridge rail types are under consideration: the Texas Bridge Railing (C412) and ST-70. At this time, the Texas Bridge Railing is the preferred bridge railing

option as this see-through bridge railing minimizes aesthetics/visual impacts while emulating the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives. The ST-70 metal rail type would have a more modern character, but would have greater visual transparency, allowing better views through the railing to the creek. Both types would be visually compatible and unobtrusive in their setting, and both would be aesthetically substantially superior to standard safety barriers or other opaque concrete barrier types. Figures 7, 8, and 9 depict the bridge with the various railing options currently under consideration.

Construction of the replacement bridge on a new alignment would require removal of a number of trees and other vegetation within the project footprint. However, much as discussed under KVP-1, above, and as depicted in Figures 7, 8, and 9 below, the removal of these trees would simply expose other mature trees directly behind them. The overall change in visual character and quality as a result of this tree removal and other visual effects would be minor. Vividness could decline slightly due to loss of the period character (1928) of the railing design. Intactness and unity of the scene in this segment would remain substantially as they are: the natural setting would continue to predominate. In the long term, after removal of the existing bridge and a period of maturation of replacement planting and revegetation, the overall resource change would be moderately low. In the context of moderately high viewer response, this would be a moderate, less-than-significant impact.

Resource Change– (Build Alternatives 2, 3A and 3B)
Under Build Alternatives 2, 3A and 3B, potential visual effects to motorists and Niles Canyon Railway passengers in the western approach section depicted in KVP-2 would all be essentially the same as those described for Build Alternative 1, above. For this reason, as for KVP-1, simulation of the four Build Alternatives from KVP-2 was not considered useful or necessary, and all four are represented by Figures 7, 8, and 9.

Similar to Build Alternative 1, the scale of the new bridge and its relationship to the immediate surroundings would be substantially similar to the existing condition. The alignment would be altered slightly, but after construction, removal of the existing bridge, and a short period of vegetation establishment, the overall character of the new bridge and its immediate setting would appear substantially similar to the existing condition. The design character would vary depending upon the choice of bridge rail type, but both types would be visually compatible and unobtrusive in their setting, and both would be aesthetically substantially superior to standard safety barriers or other opaque concrete barrier types.

The overall change in visual character and quality as a result of this tree removal and other visual effects would be moderately low. In the context of moderately high viewer response, this would be a moderate, less-than-significant impact.

Figure 6. KVP-2 Existing View – Looking south to existing bridge

Figure 7. KVP-2 – Simulated View of proposed replacement bridge (All Build Alternatives): ST-70 Brown Rail

Figure 8. KVP-2 – Simulated View of proposed replacement bridge (All Build Alternatives): ST-70 Galvanized Rail

Figure 9. KVP-2 – Simulated View of proposed replacement bridge (All Build Alternatives): Texas Bridge Rail

KEY VIEW POINT (KVP-3) – Westbound View of Proposed Side-Slope Viaduct, Upslope Retaining Wall or Rock Cut, Looking North (Figures 10, 11, 12, 13, 14, 15, 16, and 17)

KVP-3: – Existing Condition
The greatest potential for visual impacts of the project would occur in the vicinity of KVP-3, to motorists in the section south of the replacement bridge. There, proposed upslope retaining walls or rock cut slopes would be prominently visible to motorists in the immediate visual foreground. The Build Alternatives also differ the most visually in this section, as described below.

Visual character and quality of the project viewshed are essentially similar throughout, as described above in the existing condition for KVP-1. Visual quality of all key viewpoints is high.

Viewer Response
As described above, viewer sensitivity for all viewpoints is generally high for motorists and Niles Canyon Railway passengers, but viewer response is moderated at each viewpoint by the short duration of exposure to each particular project feature. In the case of viewpoint KVP-3, the duration of exposure to the primary source of visual change, the upslope soil-nail wall or rock cuts, would vary between Build Alternatives due to difference in wall/cut length. Under Build Alternative 1, exposure to the soil-nail wall would be roughly 17 seconds at 45 mph, brief but long enough to form a strong visual impression. Under Build Alternative 2, exposure would be roughly 9 seconds at 45 mph, half the duration but possibly long enough to form a lasting impression. Under Build Alternative 3A, exposure to two consecutive walls would last from 13 to 17 seconds, similar to Build Alternative 1. Under Build Alternative 3B, exposure would last roughly four to five seconds, and would tend to appear fleeting. Overall, viewer response under Build Alternatives 1, 2, and 3A is considered moderately high, and under Build Alternative 3B, moderate.

Figure 10. KVP-3 – Existing View looking north

KVP-3: Proposed Condition – (Build Alternative 1)
Resource Change
Figure 11 depicts a simulated view of Build Alternative 1 from KVP-3 shortly after project construction, shown with the ST-70 Rail option. Figure 12 depicts Build Alternative 1, shown with the Texas Bridge Rail option. The simulations illustrate the proposed uphill soil-nail retaining wall, which under Build Alternative 1 would extend 1,090 feet, from shortly beyond the replacement bridge to the eastern project terminus, with a maximum height of 20 feet. The historic Sunol Aqueduct is the concrete structure visible upslope in the photograph.

The proposed retaining wall would vary in height but would be up to 20 feet in height near the bridge crossing. Due to its considerable height and length, the proposed upslope wall would remain highly prominent. The increased scale of the roadway due to widening would add incrementally to the overall strong level of visual intrusion. As depicted in Figure 11, the proposed wall would introduce a prominent hardscape feature into the immediate highway foreground in place of the existing vegetated slope. This wall would contrast strongly with the intact natural setting, minimally affected within the last 50 years, and would represent a strong visual intrusion.

Without mitigation, these changes would together result in a strong decline in intactness and unity of the setting, and high overall visual change for motorists in this road segment. In the context of moderately high motorist viewer response, this would remain a moderately high impact.

However, specific selection of design treatments would be done during the design phase of the project in conjunction with public input. With appropriate design measures, as described further below, the potential impacts of the upslope retaining wall could be reduced. Those measures should include minimization of overall height and scale of walls to the greatest feasible extent; and use of context-sensitive textures and colors appropriate to the specific situation in order to reduce contrast of color and character of the retaining walls with the adjoining setting. Figure 11 depicts one such surface texture and color treatment, in this case one that mimics natural rock formations in Niles Canyon. Such measures could reduce the associated adverse decline in intactness and unity of the highway corridor by reducing the contrast and prominence of the walls.

A concrete Texas Bridge Railing (C412) or ST-70 see-through metal safety railing would be used on the outboard side of the viaduct. These railings are highly transparent, allowing views through the rail and minimizing contrast in visual character compared to solid concrete railings. Both railing types would be compatible with the character of the setting and have a low impact on visual intactness and unity. Because the railing type has not yet been determined, both types are depicted in the simulated images.

As may be seen in the simulation, the historic Niles Aqueduct, visible in both the existing and simulated images, would be unaffected by the proposed retaining walls, and in some locations its visibility to the public would increase due to increased exposure from project vegetation removal.

Figure 11. KVP-3 – Simulated view of Build Alternative 1 from KVP-3 after construction: shown with ST-70 metal bridge rail

Figure 12. KVP-3 – Simulated view of Build Alternative 1 from KVP-3 after 15 years: shown with concrete Texas Bridge rail

KVP-3: Proposed Condition – (Build Alternative 2)

Resource Change

Figure 13 depicts Build Alternative 2 from viewpoint KVP-3 after construction, and Figure 14 depicts the same view after 15 years of vegetation growth. Under Build Alternative 2, a 470-foot-long upslope rock cut surface up to 23 feet in height would begin just east (south) of the replacement bridge. As described in Chapter 1, the rock cut would have ¾:1 side-slope and range in height between two feet and 23 feet. The rock cut surface would be relatively uniform, with a somewhat engineered, graded appearance. Erosion-control netting and filter fabric would be placed over the cut slope to encourage revegetation. Double-twisted wire mesh would then be placed over the filter fabric and erosion-control netting, anchored at the top of the slope with surface mounted rock anchor bolts, to maintain the integrity of the rock cut, while also containing the erosion control fabric and encouraging capture of soil to facilitate revegetation. Anchors would be installed by drilling a hole in the slope, placing the anchor in the hole and grouting it into the hole. After the system is installed, hydroseeding would be applied to help stabilize the near-surface-slope environment and speed up plant re-establishment. As shown in Figure 13, immediately after construction the erosion control netting and hydroseeding would create relatively strong visual contrast and a substantial short-term reduction in visual intactness and unity. As depicted in Figure 14, after a period of re-growth the cut slope would be expected to partially revegetate within a relatively short period after construction. Because the railing type has not yet been determined, both types are depicted in the simulated images. With the implementation of avoidance and minimization measures described in Section 2.1.4.4, including use of non-contrasting wire mesh and revegetation, visual contrast of the wire mesh could be reduced, and the cut and revegetated slope would regain a more natural, less contrastive appearance in the long term. After a few years, the decline in visual quality and character, accounting for expected re-vegetation and the short duration of view, would be moderately low. Even in the context of moderately high viewer response of motorists, this would be a moderate, less-than-significant impact.

Figure 13. KVP-3 – Simulated view of Build Alternative 2 from KVP-3 after construction: shown with ST-70 Rail

Figure 14. KVP-3 – Simulated view of Build Alternative 2 from KVP-3 after 15 years vegetation growth: shown with Texas Bridge Rail

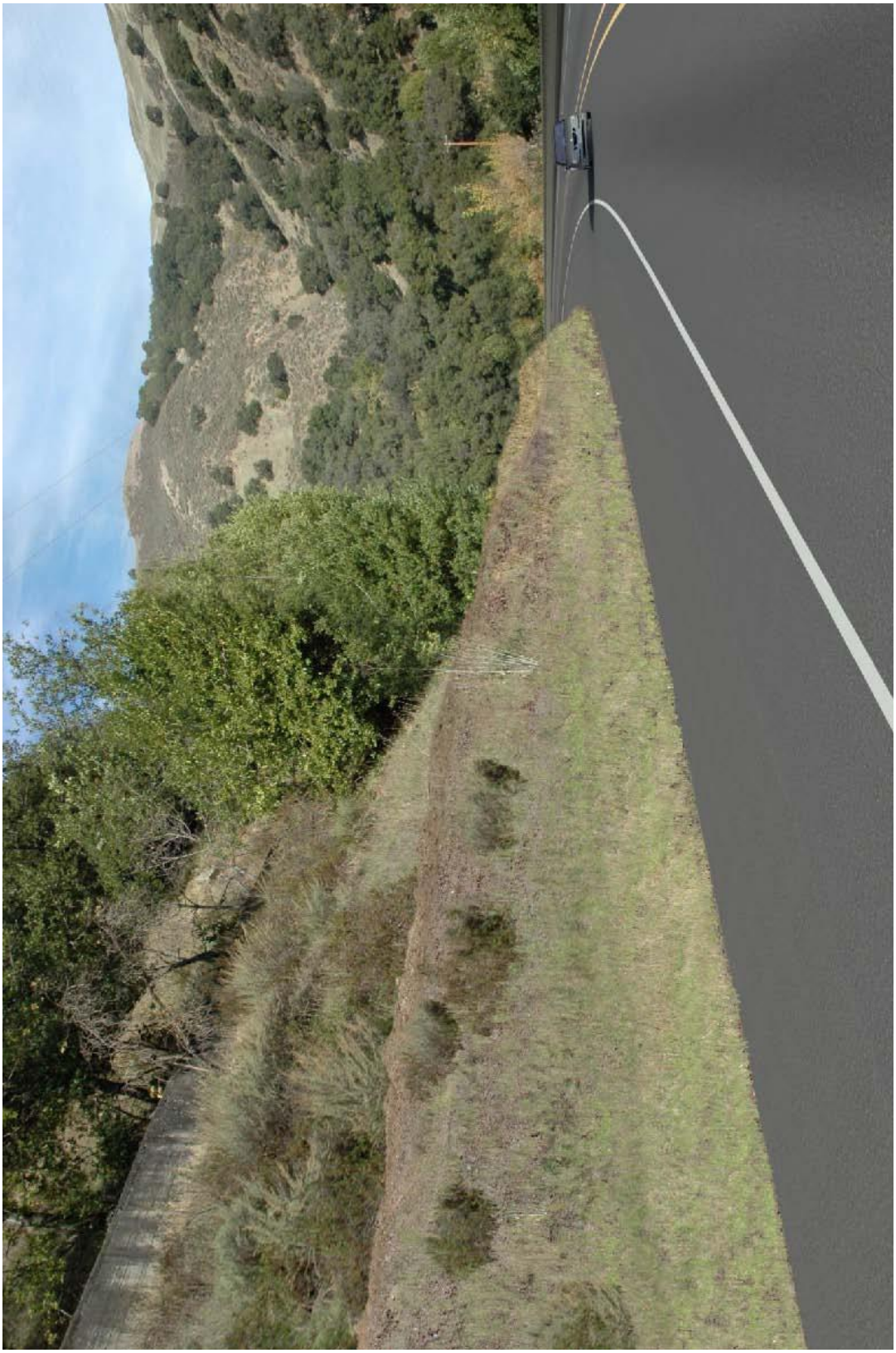
KVP-3: Proposed Condition – (Build Alternative 3A)

Resource Change

Figure 15 depicts Build Alternative 3A from viewpoint KVP-3 after construction, and Figure 16 depicts the same view after 15 years of vegetation growth. The primary difference in configuration from Build Alternative 2 is the 2:1 soil slope at the shoulder, beneath the rock cut area, under Build Alternative 3A (the soil slope area appears very short from this particular viewpoint; however the height of the slope would vary and be higher in other specific locations). In addition, rock cuts under Build Alternative 3A would be longer than under Build Alternative 2. Build Alternative 3A would be very similar to Build Alternative 2 in the section immediately south (east) of the new bridge, where there would be an 800-foot-long rock cut and soil-nail wall combination with a similar maximum height of 21 feet. The rock cut and soil-nail combination would occupy the motorist's view over a distance of about 1,100 feet or a duration of roughly 17 seconds at 45 mph, similar to the duration of exposure under Build Alternative 1. The design of the rock cuts would be as described under Build Alternative 2, above, except that a soil-nail concrete retaining wall would be constructed between the edge of the roadway and the bottom of the rock cuts. This retaining wall would be completely concealed by a 2:1 soil embankment of up to 13 feet, reaching to the bottom of the rock cut area. Overall, the appearance and prominence of the rock cuts under Build Alternative 3A would be very similar to Build Alternative 2. The soil slope embankment at the edge of the roadway would quickly revegetate with local vegetation, blending with the existing natural setting. The combination of rock cuts and soil-nail walls would increase the extent and duration of the view of the rock cut area, similar to Build Alternative 1 and long enough to make a lasting impression. Immediately after construction the erosion control netting and hydroseeding would create relatively strong visual contrast and a strong reduction in visual intactness and unity, as depicted in Figure 15 (Build Alternative 3A after construction). However, as depicted in Figure 16 (Build Alternative 3A after 15 years), the slope would be expected to partially revegetate within a relatively short period after construction and continue to become less visually evident with time. Because the railing type has not yet been determined, both types are depicted in the simulated images. With the implementation of mitigation measures, visual contrast of the wire mesh could be minimized, and the cut and revegetated slope would regain a more natural, less intrusive and contrastive appearance. Within two to three years, the decline in visual character and quality, accounting for re-vegetation, would be moderately low. The overall effect of Build Alternative 3A in this section would be less than Build Alternative 1, and though somewhat more pronounced than Build Alternative 2, even in the context of moderately high viewer response of motorists, would be a moderate, less-than-significant impact. In the context of moderately high viewer response of motorists, however, this could remain a moderately high, potentially substantial impact.

Figure 15. KVP-3 – Simulated view of Build Alternative 3A from KVP-3 after construction: shown with ST-70 Rail

Figure 16. KVP-3 – Simulated view of Build Alternative 3A from KVP-3 after 15 years vegetation growth: shown with Texas Bridge railing



KVP-3: Proposed Condition – (Build Alternative 3B)

Resource Change

Because of the comparatively short length of the upslope rock cut under Build Alternative 3B, this alternative would appear very similar to existing conditions from viewpoint KVP-3 except for the widening of the roadway and addition of westbound safety railing. Figure 17 depicts Build Alternative 3B, shown with Texas Bridge Rail option, as seen from viewpoint KVP-3. In the section where upslope rock cuts would be visible, Build Alternative 3B would appear substantially similar to the depiction of Build Alternative 3A in Figure 15 and 16 and Figures 25 and 26. Build Alternative 3B would be the same as Build Alternative 3A from the north project terminus to the southern bridge terminus, but would conform with the existing highway south of the new bridge much more quickly than the other alternatives. Build Alternative 3B would include a 300-foot upslope rock cut substantially similar to the first 300 feet of the rock cut under Build Alternative 3A. However, Build Alternative 3B would then conform with the existing roadway with no further rock cut. The upslope rock cut would have a maximum height of 17 feet. Though the appearance of the cut slopes would be similar to Build Alternatives 2 and 3A, the extent would be much less, and overall impact would be correspondingly less. As under Build Alternatives 2 and 3A, immediately after construction the erosion control netting and hydroseeding would create relatively strong visual contrast and a reduction in visual intactness and unity. However, the slope would be expected to revegetate within a relatively short period after construction. Mitigation measures would minimize visual contrast of the wire mesh, and the cut and revegetated slope would regain a more natural, less intrusive appearance. After two to three years, the decline in visual character and quality, accounting for revegetation and the very short duration of view, would be moderately low. In the context of moderate viewer response of motorists under Build Alternative 3B, this would be a moderate, less-than-significant impact. Of all alternatives, Build Alternative 3B would have the least visual impact.

Figure 17. KVP-3 – Simulated view of Build Alternative 3B from KVP-3: shown with Texas Bridge Rail

Views to the Road (from Niles Canyon Railway) (KVPs4-5)

KEY VIEW POINT (KVP-4) – View of Proposed Bridge from Niles Canyon Railway, Looking West (Figures 18, 19, 20, and 21)

KVP-4: Existing Condition

KVP-4 represents the view of Niles Canyon Railway passengers looking directly toward the proposed replacement bridge over a short segment of the railway (approximately 500 feet).

Visual character and quality of the project viewshed are essentially similar throughout, and were described above. Visual quality of all key viewpoints is high.

Viewer Response

The highly filtered character of views to the highway from the Niles Canyon Railway due to intervening vegetation creates a low viewer exposure. Therefore, the overall viewer response is consequently moderated, to a moderate level. As illustrated in Figure 18, the view, though mostly blocked by foreground tree canopies and vegetation, offers intermittent glimpses of the structure at close distance.

Figure 18 depicts the existing view looking west from KVP-4.

Figure 18. KVP-4 – Existing view of existing bridge from Niles Canyon Railway

KVP-4: Proposed Condition – (Build Alternative 1)
Resource Change
As depicted in Figures 19, 20, and 21, the change in visual character and quality of views of the replacement bridge from the Niles Canyon Railway would be minor. This is because extensive, dense, mature riparian vegetation along Alameda Creek west of the Niles Canyon Railway rail line currently screens or strongly filters views to the existing bridge, and this would continue to be true for the replacement bridge as seen from the Niles Canyon Railway. Consequently, any decline in the existing high vividness, intactness, and unity of these views as a result of project actions would be seen in views that are both partial and fleeting, seen through openings in the dense intervening tree canopy. As indicated in Figure 18, this condition would not change appreciably due to construction of the replacement bridge. The trees screening the roadway from the Niles Canyon Railway are largely on the eastern bank of Alameda Creek and are not anticipated to be affected by project construction. Some of the riparian trees screening view KVP-4, such as willow, are deciduous. Views to the project would be more open and prominent in winter months, mainly between November and toward the end of February. Regular operations of the Niles Canyon Railway are limited in November, January, and February. Holiday programs taking place in December occur only at night, so views of the bridge at these times would be negligible.

Where the structure is visible, change to the visual character and quality of this view could result from the changes in design of the structure itself. To the extent that the existing bridge is visible from the Niles Canyon Railway, it is seen at relatively close distance. The preferred concrete Texas Bridge Railing treatment on the bridge would preserve a period character of the parapet similar to the existing, 1928 vintage design. A ST-70 contemporary metal railing treatment would appear more modern, but also more transparent and less visually prominent. Because the railing type has not yet been determined, both types are depicted in the simulated images. The replacement bridge structure as a whole would not be substantially more prominent to Niles Canyon Railway viewers. Accounting for the very limited and fleeting visibility of the bridge in these views, a moderately low decline in vividness and intactness, and a moderately low level of visual character change would result from the change to a more modern style of bridge design. By this measure, in the context of moderate viewer response of Niles Canyon Railway passengers, this would be a moderate, less-than-significant impact.

For passengers on the historic Niles Canyon Railway trains, the visual setting, minimally altered over the last 50 years, is an important part of their experience. To the extent that the new bridge attracts the attention of passengers, a modern style of design could be seen as altering the setting somewhat. The existing bridge is not from the same historic period as the Niles Canyon Railway, however, and the existing Niles Canyon Railway route is not currently completely devoid of views of the highway and other anachronistic modern features. Accounting for the very fleeting nature of these views, the effect on the historic integrity of the Niles Canyon Railway would appear to be muted. Caltrans concludes that this minimal change in the viewscape from the NCTR would have no adverse effect to the historic NCTR. Caltrans is continuing consultation with the SHPO and the PLA

regarding this determination of no adverse effect as part of the Section 106 process (see Section 2.1.5, Cultural Resources).

Other visual impacts to the Niles Canyon Railway in this portion of the project setting could occur as a result of construction, particularly any tree removal west of the creek to provide access for equipment or materials during construction. To avoid or minimize any such construction effects, measure VISUAL-4 will be implemented..

KVP-4: Proposed Condition – (Build Alternatives 2, 3A, and 3B)
Resource Change
Under Build Alternatives 2, 3A, and 3B, potential visual effects to Niles Canyon Railway passengers depicted in KVP-4 would all be similar to those described for Build Alternative 1, above. For this reason, as for KVP-1 and KVP-2, simulations of the four Build Alternatives from KVP-4 were not considered useful or necessary, and all four are represented by Figures 19, 20, and 21.

As under Build Alternative 1, due to the very limited and fleeting visibility of the new bridge in these views, a moderately low decline in vividness and intactness, and a moderately low level of visual character change is anticipated from the change to a more modern style of bridge design. By this measure, in the context of moderate viewer response of Niles Canyon Railway passengers, this would be a moderate, less-than-significant impact.

Figure 19. KVP-4 – Simulated view of proposed replacement bridge from Niles Canyon Railway: shown with ST-70 Brown Rail

Figure 20. KVP-4– Simulated view of proposed replacement bridge from Niles Canyon Railway: shown with ST-70 Galvanized Rail

Figure 21. KVP-4 – Simulated view of proposed replacement bridge from Niles Canyon Railway: shown with Texas Bridge Rail

KEY VIEW POINT (KVP-5) – View looking west from Niles Canyon Railway (Figures 22, 23, 24, 25, and 26)

KVP-5: Existing Condition
For a relatively short segment of the Niles Canyon Railway (approximately one-quarter-mile), west-facing train passengers would face in the direction of a large uphill retaining wall or rock cuts of various lengths, to be located south of the proposed replacement bridge at a distance of as little as 250 feet under all Build Alternatives. KVP-5 represents worst-case views of the project from this segment of the Niles Canyon Railway.

Visual character and quality of the project viewshed are essentially similar throughout, and were described above. Visual quality of all key viewpoints is high.

Viewer Response
As under KVP-4, because of the highly filtered character of views to the highway from the Niles Canyon Railway due to intervening vegetation, viewer exposure is low, and overall viewer response is consequently moderated, to a moderate level. As illustrated in Figure 22 (KVP-5 existing), the view, though mostly blocked by foreground tree canopies and vegetation, offers intermittent glimpses of the structure at close distance.

Figure 22 depicts the existing view from KVP-5, looking west from the Niles Canyon Railway.

KVP-5: Proposed Condition – (Build Alternative 1)
Resource Change
Key Viewpoint 5 is very similar to KVP-4, depicting a view from the Niles Canyon Railway looking west toward SR 84, a short distance south of KVP-4. As depicted in Figure 23 (Simulated view of Build Alternative 1 from KVP-5 looking west from Niles Canyon Railway, after construction), under Build Alternative 1, a 1,090-foot–long soil-nail retaining wall up to 20 feet in height would be intermittently visible to Niles Canyon Railway passengers above the new roadway in this section, over a distance of roughly ¼-mile of the railroad. For most of that section, a Type 1 concrete retaining wall, up to 36 feet in height, facing the creek and railroad, would support the roadway and also be intermittently visible through intervening tree canopy. As indicated in Figure 23, because of its lower position in relation to Niles Canyon Railway passengers and the density of creek-side vegetation, the lower retaining wall would be mostly blocked from view. Because the railing type has not yet been determined, both types are depicted in the simulated images.

Views of the proposed roadway and retaining wall in this section would be occasionally visible as shown in the simulation, but would be mostly obscured and highly filtered by dense intervening vegetation on the east side of the creek, adjacent to the Niles Canyon Railway. Although the proposed down-slope retaining wall would also be occasionally visible from the Niles Canyon Railway, these views would be even more highly filtered due to the density of lower vegetation on both east and west sides of the creek. Some existing trees on the west side of the creek could be removed for construction of the

creek-side Type 1 retaining wall. However, the density of existing trees east of the new alignment, on both the east and west sides of the creek, indicate that the visual buffer of existing tree canopy would remain substantial as seen by Niles Canyon Railway viewers even with some tree removal for wall construction. The existing vegetation east of the creek is not anticipated to be affected by project construction in this segment south of the bridge at all. The mostly momentary views of the project from the Niles Canyon Railway, seen through a substantial buffer of tree canopy east and west of the creek, are not anticipated to dominate Niles Canyon Railway viewers' attention or substantially alter their experience of the overall setting. The effect of Build Alternative 1 in this segment on vividness, intactness, unity and overall visual quality, as well as visual character, would be moderately low as seen by Niles Canyon Railway passengers. As discussed under KVP-4, views of the project could be somewhat more prominent in fall and winter months due to seasonal absence of deciduous tree canopy. Overall, however, the viaduct and wall would have minimal effects on sensitive viewers on the Niles Canyon Railway, and the level of visual resource change would be moderately low. In the context of moderate viewer response of Niles Canyon Railway viewers, this would represent a moderate, less-than-significant impact.

Retaining wall measures in VISUAL-2 would reduce potential retaining wall impacts to Niles Canyon Railway passengers. These measures include appropriate context-sensitive wall color and texture treatment to minimize contrast with the existing natural and historic setting.

Visual impacts to the Niles Canyon Railway in this portion of the project setting would occur primarily as a result of construction, particularly tree removal east of the creek to provide access for equipment or materials during construction. To avoid or minimize any such construction effects, measure VISUAL-4 would be implemented as described in Section 2.1.4.4.

Figure 22. KVP-5 – Existing view from KVP-5 looking west from Niles Canyon Railway

Figure 23. KVP-5 – Simulated view of Build Alternative 1 from KVP-5 looking west from Niles Canyon Railway, after construction: shown with ST-70 Rail

Figure 24. KVP-5 – Simulated view of Build Alternative 1 from KVP-5 looking west from Niles Canyon Railway, after 15 years: Shown with Texas Bridge Rail

KVP-5: Proposed Condition – (Build Alternative 2)
In contrast to Build Alternative 1's 1,090 feet of uphill soil-nail retaining wall, Build Alternative 2 would have 470 feet of uphill rock cut with anchored wire mesh and erosion control netting. Like Build Alternative 1, the roadway would also be supported in this section by a concrete Type 1 retaining wall of similar length (1,150 feet) and maximum height of approximately 23 feet. As discussed above, rock cuts would be less visually intrusive than soil-nail walls, particularly in the long term after revegetation begins to establish. The downhill wall would be substantially similar to Build Alternative 1, and would be largely screened by creek-side vegetation.

Build Alternatives 2, 3A, and 3B would appear similar in configuration from this viewpoint. The primary difference among them from this viewpoint would be the length of the rock cut. For that reason, all three Build Alternatives are represented here by Figures 25 and 26 which depict Build Alternative 3A. Build Alternative 3A has the longest rock cuts of these three Build Alternatives and so represents a worst-case view. However, in general appearance, the rock cut areas would appear similar to this depiction. Because the railing type has not yet been determined, both types are depicted in the simulated images.

As shown in Figure 25 (KVP-5, Simulated view of Build Alternative 3A looking west from Niles Canyon Railway after construction), immediately after construction the erosion control netting and hydroseeding would create relatively strong visual contrast and a substantial short-term reduction in visual intactness and unity. As depicted in Figure 26 (KVP-5, Simulated view Build Alternative 3A looking west from Niles Canyon Railway after 15 years vegetation growth), the slope would be expected to partially revegetate within a relatively short period after construction. With the implementation of avoidance and minimization measures described in Section 2.1.4.4, including revegetation and use of non-contrasting wire mesh, visual contrast of the wire mesh would be reduced, and the cut and revegetated slope would regain a more natural, less contrastive appearance in the long term. After a few years, the decline in visual quality, accounting for expected re-vegetation and the short duration of view, would be moderately low.

Consequently, because of the uphill rock cut's smaller scale and less visually contrastive character (in the long term), the impact of views of Build Alternative 2 from KVP-5 would be less than Build Alternative 1. As under Build Alternative 1, potential impacts of these views would be highly muted by the general visual filtering of intervening creek-side vegetation in the foreground of Niles Canyon Railway passengers. The overall level of visual change would be moderately low. In the context of moderate viewer response of Niles Canyon Railway viewers, this would represent a moderate, less-than-significant impact.

KVP-5: Proposed Condition – (Build Alternative 3A)
Under Build Alternative 3A, there would be a combination of rock cuts with anchor wire mesh and soil-nail walls, combining for a total length of 800 feet in a segment facing the Niles Canyon Railway at relatively close distance. Unlike Build Alternatives 1 and 2,

Build Alternative 3A would be supported in this section by a sidehill viaduct structure consisting of concrete columns supporting a pre-cast concrete deck, as depicted in Figures 25 and 26.

Despite the differences in uphill rock cut length and use of a viaduct-column support structure, the overall visual effects of Build Alternative 3A would be similar in type and character to Build Alternative 2. The uphill rock cut would be longer than Build Alternative 2 in length; the downhill structure would be less contrastive in character than the retaining walls under Build Alternatives 1 and 2. However, since both the downhill retaining walls and viaduct-column structures would be largely screened by vegetation, neither would be highly visible. The visual impact of rock cuts under Build Alternative 3A would be somewhat greater in extent than Build Alternative 2, but would be partially mitigated by a revegetated 2:1 soil slope beneath the rock cuts at the side of the road, as depicted in Figure 15 (KVP-3, Simulated view of Build Alternative 2 from KVP-3 after 15 years vegetation growth). This soil slope, concealing a soil-nail retaining wall beneath, would quickly revegetate with typical local and native vegetation and blend with the existing setting. Overall, like Build Alternative 2, the level of visual change would be low to moderately low. In the context of moderate viewer response of Niles Canyon Railway viewers, this would represent a moderate, less-than-significant impact.

KVP-5: Proposed Condition – (Build Alternative 3B)
Under Build Alternative 3B, there would be a 300-foot-long uphill rock cut, substantially shorter than under Build Alternative 3A, and somewhat shorter than Build Alternative 2. The roadway, supported by a sidehill viaduct structure as under Build Alternative 3A, would also conform to existing grade much sooner than under the three other Build Alternatives, making the overall viaduct section much shorter than under the other Build Alternatives. Overall, visual change due to the project from the Niles Canyon Railway in this section would be low. In the context of moderate viewer response of Niles Canyon Railway viewers, this would represent a moderately low, less-than-significant impact. Due to the much smaller scale of the potentially prominent viaduct and rock cuts under Build Alternative 3B, this alternative would have appreciably less potential for visual impact than the other alternatives, from this and all other key viewpoints.

Figure 25. KVP-5 – Simulated view of Build Alternative 3A looking west from Niles Canyon Railway after construction: shown with ST-70 Rail

Figure 26. KVP-5 – Simulated view Build Alternative 3A looking west from Niles Canyon Railway after 15 years vegetation growth: shown with ST-70 Rail.

Overall, Build Alternatives 1 and 3A would result in a larger impact to visual/aesthetics than Build Alternatives 2 and 3B. Build Alternative 1 would result in an increased visual/aesthetic impact as a result of the construction of the 1,090 linear feet long concrete soil-nail wall adjacent to the roadway and larger amount of tree removal. Additionally, there would be an increased impact from construction of the Type 1 downslope retaining wall from the Alameda Creek area in comparison to the construction of the sidehill viaduct and piles from the roadway as proposed in Build Alternatives 3A and 3B. As a result, construction of the sidehill viaduct would have less impact to Alameda Creek vegetation. Build Alternative 3A would result in a larger impact as a result of the construction of the combination of rock cuts and soil-nail wall, totaling 800 linear feet. The combination of rock cuts and soil-nail walls would increase the extent and duration of the view of the rock cut area, similar to Build Alternative 1 and long enough to make a lasting impression. Immediately after construction the erosion control netting and hydroseeding would create relatively strong visual contrast and a strong reduction in visual intactness and unity, as depicted in Figure 15 (Build Alternative 3A from KVP-3 after construction). However, as depicted in Figure 16 (Build Alternative 3Afrom KVP-3 after 15 years), the slope would be expected to partially revegetate within a relatively short period after construction and continue to become less visually evident with time. Since revegetation does not incorporate replanting of trees on the resulting ¾:1 slope, the rock cut would be visually apparent until the grasses and wildflowers fill in over time. In comparison, the rock cut for Build Alternative 3B totals only 300 linear feet.

Build Alternative 2 involves the construction of a Type 1 downslope retaining wall and 470 linear feet of rock cut. Build Alternative 2 would result in a smaller impact than Build Alternatives 1 and 3A, but would have a greater visual/aesthetic impact than Build Alternative 3B, which has the least amount of impact to visual/aesthetics out of the four Build Alternatives.

Build Alternatives 1 and 3A could have a potentially significant impact on visual/aesthetics. The potentially significant impact to visual/aesthetics from Build Alternative 1 is a result of the construction of the 1,090-foot long uphill soil-nail retaining on the eastern approach to the Alameda Creek Bridge. As a result, mitigation measures were developed to minimize the height and scale of the walls and use of context-sensitive textures and colors to reduce contrast of color and character of the retaining wall to reduce Build Alternative 1's impacts on visual/aesthetics. With the implementation of mitigation measure VISUAL-2, Build Alternative 1's impacts on visual/aesthetics would be less than significant. The potentially significant impact to visual/aesthetics from Build Alternative 3A is a result of the length of the combination of rock cuts and soil-nail wall on the eastern approach to the Alameda Creek Bridge. As a result, mitigation measures were developed to minimize visual/aesthetics impacts from the rock cuts and soil-nail wall by applying hydroseeded revegetation, including locally native species, to blend with the surrounding setting and selecting wire mesh to match the color and value of the underlying soil substrate to minimize visual contrast. With the implementation of mitigation measure VISUAL-2, Build Alternative 3A's impact on visual/aesthetics would be less than significant.

In conclusion, Build Alternatives 1 and 3A would have a less-than-significant impact on visual/aesthetics with mitigation while Build Alternatives 2 and 3B would have a less-than-significant impact on visual/aesthetics.

No-Build Alternative
Under the No-Build Alternative, the replacement bridge would not be constructed. The visual experience of motorists and Niles Canyon Railway passengers would remain as they are currently.

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

VISUAL-1. To address loss of existing aesthetic bridge design features, and to off-set potential corridor-wide cumulative visual impacts, context-sensitive design features shall be considered where feasible, including:

- See-through bridge and viaduct barrier design, preferably concrete Texas Bridge Railing C412 or metal ST-70 rail.
- If approved, the metal ST-70 rail could be treated with a flat brown color to reduce glare of metal finish and blend into surrounding setting.
- Metal guardrail should be treated with coating to turn bright metal surfaces to a dull brown color, to reduce glare and blend with surroundings.

VISUAL-2. The following upslope retaining wall measures will be implemented:

- Minimize the overall height of walls to the greatest extent feasible. In general, from a visual perspective, downslope widening is preferable and has less impact than upslope widening. Downslope widening may, however, have other environmental effects and would require evaluation for feasibility in light of those effects.
- Use appropriate context-sensitive wall texture and/or color treatments on all upslope and downslope walls as identified in the visual impact assessment, to minimize contrast with the existing natural and historic settings. Concrete safety-shape barriers shall receive color stain to lower contrast with the walls and reduce glare. Surface texture treatments shall be developed in consultation with local agencies.
- Employ color staining of the concrete safety barrier of upslope retaining walls to reduce overall contrast between the walls and the barriers.
- Coordinate wall and concrete safety-shape barrier aesthetic treatments and carry consistent themes throughout the corridor.
- Where anchored or draped wire mesh slope protection is required:
    - Wherever feasible, apply hydroseeded revegetation including locally native species to blend with the surrounding setting.
    - Wire mesh shall be selected to match color and value of the underlying soil substrate to the greatest feasible extent in order to minimize visual contrast: For example, light-colored mesh over light-colored substrate; dark-colored mesh over dark substrate.

VISUAL-3. The following tree and vegetation removal measures will be implemented:
a. Minimization or Avoidance of Tree/Vegetation Removal Due to Construction

- Minimize removal of large native riparian trees to the greatest extent feasible.
- In areas where maximum protection of vegetation is desirable, as determined during the project design phase, clear and grub only within excavation and embankment slope limits.
- Protect existing vegetation outside of clearing and grubbing limits from the contractor's operations, equipment, and materials storage.
- Limit tree trimming by the contractor to that required to provide a clear work area.
- Limit clearing and grubbing behind upslope retaining walls to a maximum of 5 feet from the back of the wall.
- Place high visibility temporary fencing around significant trees or other desirable vegetation to be protected before roadway construction begins.
- The Engineer would field mark and approve all trees to be removed prior to removal.
- Adjust slope lines wherever feasible to avoid the removal of trees and other desirable vegetation.
- Implement design exceptions to avoid removal of significant existing vegetation. Design exceptions may include reducing the width of the standard grading catch line to minimize vegetation removal; steepening of cut and fill slopes; installing guardrails around any trees classified as a scenic resource to allow retention at the shoulder; or other measures as recommended in the visual impact assessment or as determined during the project design or construction phases.
- Take particular care in revegetating and enhancing the area of superseded roadway south of the western bridge approach, to achieve a natural appearance in the short term and to enhance presence of oak woodland in the roadway foreground of this segment.

b. Mitigation of West Embankment Impacts to Niles Canyon Railway, Build Alternative 1

- Implement dense tree re-planting and re-vegetation on the north-facing berm of the western approach under Build Alternative 1 to provide screening and minimize visibility of project as seen by Niles Canyon Railway passengers where feasible

c. Tree Replacement at East Down-slope Retaining Wall under Build Alternatives 1 and 2

- If views of the retaining wall from the Niles Canyon Railway due to tree removal for wall construction are identified, visual screening shall be restored through replacement planting of trees within State right-of-way as needed to restore visual screening from Niles Canyon Railway.

d. Highway Planting

- Implement required mitigation planting per Chapter 29 (Highway Planting) of the Caltrans Project Development Procedures Manual and Chapter 900 (Landscape Architecture) of the Caltrans Highway Design Manual.
- Replace all disturbed areas of native vegetation in kind at a minimum ratio of 1:1.
- Fund required mitigation planting through the parent roadway contract, programmed and completed as a separate contract within two years of completion of all roadwork.
- Provide all disturbed areas with permanent erosion-control grasses.

e. Revegetation

- All disturbed areas shall be provided with permanent erosion-control grasses and appropriate, locally native revegetation. Trees removed as a result of construction operations shall be replaced at a minimum ratio of 1:1 at locations closest to the impacted area wherever feasible and, where in-place planting is not feasible, off-site in the corridor visual foreground and in kind. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements.

VISUAL-4. The following construction impact measures will be implemented:

- Place unsightly material, equipment storage and staging so that they are not visible within the foreground of the highway corridor to the extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors.
- Screen construction, staging, and storage areas by visually opaque screening wherever they would be exposed to public view for extended periods of time.
- Phase construction activities to minimize the duration of disturbance to the shortest feasible time.
- Revegetate all areas disturbed by construction, staging, and storage per Measure VISUAL-3, above.
- Limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.
- Where the existing roadway is to be superseded, existing pavement and roadbed shall be removed and contour graded to provide a natural appearance and blend with the adjacent landform. Graded areas shall be revegetated as described under measure VISUAL-3, above.
- Equipment access and storage for retaining wall construction under Build Alternatives 1 and 2 shall be restricted to the west bank of the creek in the segment south of the bridge to the greatest feasible extent. Where such restriction is unavoidable, damage to the trees and forest canopy on the creek's east bank shall be minimized to the smallest feasible area of disturbance, and be revegetated with replacement native riparian trees immediately following project completion.

2.1.5 Cultural Resources

2.1.5.1 Regulatory Setting

The term "cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Both federal and state laws and regulations address the protection of cultural resources.

Federal

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the NRHP. Section 106 of the NHPA

requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800). Caltrans treats properties listed in the NRHP as historical resources subject to protection pursuant to CEQA and Public Resources Code Section 5024.

On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327). The Section 106 PA guides all Caltrans projects in compliance with NHPA, CEQA and CA Public Resources Code (PRC) Section 5024.1. Under Caltrans guidelines and policy, treatment and consideration of all cultural resources follows federal standards.

State

Historical resources are considered under CEQA, as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources (CRHR). Public Resources Code Section 5024 requires state agencies to identify and protect state-owned resources that meet NRHP and California Historical Landmark listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the SHPO before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the NRHP or are registered or eligible for registration as California Historical Landmarks. The CEQA Guidelines define a historical resource as, "a resource listed or eligible for listing on the CRHR," properties included in a qualified local register of historic resources, or properties deemed significant pursuant to criteria set forth in Section 5024.1(g) (Section 15064.5[a]) of the California Public Resources Code.

It is the purpose of the State Historical Building Code to provide regulations and standards for the rehabilitation, preservation, restoration (including related reconstruction) or relocation, as applicable, to all historical buildings, structures and properties deemed of importance to the history, architecture, or culture of an area by an appropriate local or state governmental jurisdiction. Such standards and regulations are intended to facilitate the restoration or change of occupancy so as to preserve their original or restored elements and features, to encourage energy conservation and a cost effective approach to preservation, and to provide for reasonable safety from fire, seismic forces or other hazards for occupants and users of such "buildings, structures and properties" and to provide reasonable availability and usability by the physically disabled. The State Historical Building Code is defined in Sections 18950 to 18961 of Division 13, Part 2.7 of Health and Safety Code (H&SC) Health and Safety Code, a part of California Law.

2.1.5.2 Affected Environment

A Historic Property Survey Report (HPSR) for the Alameda Creek Bridge Replacement Project was completed September 29, 2010 (Caltrans, 2010d) and supplemental HPSR was completed for this project on March 17, 2014 (Caltrans, 2014e). The HPSR is a summary document used as Caltrans' decision-making document for cultural resource determinations; the HPSR includes an Archeological Study Report (ASR) and a Historic Resources Evaluation Report (HRER). The ASR documents both positive and negative archeological study results and demonstrates that a reasonable level of effort occurred to identify archeological properties. The HRER documents identification and evaluation efforts for historical archeological resources and built environment resources.

Prior to conducting field investigations, cultural resources staff reviewed existing files, records, historical documents, and maps to determine the presence of prior surveys and known or possible resources within one-eighth of a mile on either side of each of the SR-84 centerline. The cultural study area, also called the Area of Potential Effects (APE), was developed to identify cultural resources within the entire project footprint. The NRHP-eligible Sunol Aqueduct of the Spring Valley Water Company's (SVWC) Alameda Creek System lies parallel to and approximately 50-60 feet west of the current road alignment and the NRHP-listed Niles Canyon Transcontinental Railroad (NCTR) Historic District is approximately 200 feet north and east of the Alameda Creek Bridge and runs parallel to the current road alignment. The APE includes the entire 4.9 miles Sunol Aqueduct and 11.6 miles of the NCTR. However, a focused APE was established to include only the area that will be directly impacted by the project, extending from postmile 13.0 to postmile 13.6. The focused APE included maximum corridor width of 30 feet on either side of the highway centerline. The focused APE extends from postmile 13.0 to postmile 13.6.

The discussion of cultural resources identified within the APE is split into two sections: Built/Architectural Resources and Archeological Resources.

Built/Architectural Resources

The HPSR identified three built cultural resources within the APE, one of which is the existing Alameda Creek Bridge. Bridge footings and a concrete wall dating to an earlier bridge at this crossing are also within the APE; however, the bridge footings and concrete wall are fragments of a mostly vanished resource, and are exempt from consideration for NRHP eligibility. The remnant bridge footings and concrete wall act as a weir and serve as a barrier to fish passage; as described in Chapter 1, Caltrans is proposing to remove the remnant bridge footings and concrete wall as a compensatory mitigation for federal ESA consultation and environmental permits. The significance of each evaluated cultural resource within the APE is discussed below.

<u>Sunol Aqueduct of Spring Valley Water Company's Alameda Creek System</u>

In December 1998, the Sunol Aqueduct was determined eligible for individual listing on the NRHP under Criterion A. Criterion A qualifies a property for inclusion on the NRHP based on its association with events that have made a significant contribution to the broad

patterns of history. Built in 1900 by the SVWC, the Sunol Aqueduct provided a reliable source of clean water for the growing city of San Francisco in the twentieth century. The Sunol Aqueduct is significant for its association with the history of urban water supply in northern California.

Niles Canyon Transcontinental Railroad Historic District

The NCTR has been listed on the NRHP since October 13, 2010. The NRHP nomination for the NCTR states that it is significant under Criterion A. Criterion A of the NHPA qualifies a property for inclusion to the NRHP based on its association with events that have made a significant contribution to the broad patterns of history. The period of significance, or span of time during which significant events and activities occurred, begins at the construction commencement of this portion of the Transcontinental Railroad in 1865 to the end of its significance as a major transportation corridor after World War II and concludes at its final incorporation into the Southern Pacific Railroad in 1958.

The contributing features include stone elements from the original 1865 construction, the 1884 Sunol Depot, and three major steel bridges including a rare pin connected Pratt Truss. The historic property boundary also contains the remains of the transcontinental telegraph line of 1869. None of these contributing features will be affected by this project and are outside of the focused APE. The historic property boundary within the APE is delineated by the railroad right of way and varies in width from 100 feet to 400 feet along the length of the railway, depending upon the manner in which the railroad acquired it during the period of significance. At certain locations, this boundary intersects with Caltrans' existing right of way.

Alameda Creek Bridge (Bridge #33-0036)

The Alameda Creek Bridge (1928) is listed as Category 5 on the Caltrans Historic Bridge Inventory, meaning it is not eligible for the NRHP (federal), nor does it meet the criteria of the California Register of Historical Resources (state). However, the Alameda County Parks, Recreation & Historical Commission identified the bridge as potentially eligible for inclusion on the Alameda County Register (Landmarks) in 2012, although the bridge has not been formally listed on the County's register.

After the County determined the bridge had potential local significance, a qualified Caltrans architectural historian evaluated the bridge a second time and found it still to be ineligible for the NRHP, nor meeting the criteria of the California Register. The SHPO concurred with this finding on April 15, 2014.

Because of the local designation, Caltrans is considering the Alameda Creek Bridge to be a historical resource under CEQA.

As previously stated, the Alameda Creek Bridge is a locally recognized historical resource. As such, the Alameda County Parks, Recreation, and Historical Commission requested that Caltrans consider the applicability of the California Historical Building Code to the bridge. As a result of this inquiry, Caltrans consulted with the California State Historical Building Safety Board. The Board responded that Caltrans is obliged to

apply the Code to this resource. However, all Build Alternatives propose to demolish the existing Alameda Creek Bridge. Therefore, the CHBC cannot be applied to the proposed Build Alternatives.

Archeological Resources
No known archeological sites were identified in the project's APE. However, if cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Kathryn Rose, Branch Chief-Archeology so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

The NAHC was contacted on July 26, 2010 regarding the presence of sacred lands in the project area and a list of Native American contacts. The NAHC response dated July 29, 2010 stated that their search failed to indicate the presence of Native American cultural resources in the immediate project area. The NAHC list of contacts was used to send letters inviting participation in efforts to identify archeological and Native American resources. Letters were sent to the all individuals and organizations listed below:

1. Jakki Kehl, Ohlone/Costonoan
2. Katherine Erolina Perez, Ohlone/Costonoan
3. Linda G. Yamano, Ohlone/Costonoan
4. Irene Zwierlein, Chairperson, Amah/Mutsun Tribal Band
5. Jean-Marie Feyling, Amah/Mustun Tribal Band
6. Anne Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costonoan
7. Rosemary Cambra, Muwekma Ohlone Indian Tribe
8. Andrew Galvan, Ohlone Indian Tribe
9. Ramona Garibay, Trina Marine Ruano Family

No responses were received as a result of the written inquiry.

2.1.5.3 Environmental Consequences

All Build Alternatives
The impacts on cultural resources are the same across all Build Alternatives.

<u>Sunol Aqueduct of Spring Valley Water Company's Alameda Creek System</u>
In applying the Criteria of Adverse Effect, all Build Alternatives would have no effect on the Sunol Aqueduct. The Sunol Aqueduct lies mostly on the surface of the hillside, south

of the Alameda Creek Bridge (Bridge #33-0036), along the western approach, with some portions buried two to three feet below ground. Build Alternatives 1 and 3A call for the placement of a soil-nail retaining wall, more or less parallel to the Sunol Aqueduct. The wall would vary in distance from the Aqueduct from between 41.9 feet and 16 feet. The nails which would be driven horizontally through the retaining wall and into the hillside are 25 feet long. The top of the retaining wall (and the highest point at which these nails would be driven) would be between 7.8 feet and 26.4 feet below the elevation at which the bottom of the Aqueduct resides. Therefore, the nails would not impact the Aqueduct. All surface work would take place on the roadway side of the retaining wall. The long term integrity of the undeveloped setting of the Aqueduct would not be affected, since the soil-nail wall would eventually revegetated and become substantially indistinguishable from the existing setting. The Sunol Aqueduct is not affected by this project.

Caltrans is currently in consultation with the SHPO on the determination that the proposed project would have no effect on the Sunol Aqueduct.

Niles Canyon Transcontinental Railroad (NCTR) Historic District

In applying the Criteria of Adverse Effect, the proposed project would have an effect on the NCTR, but the effect would not be adverse. The project would not permanently diminish the integrity of this historic property's location, feeling, design, materials, workmanship, or association. No contributing built resources of the NCTR exist within the focused APE. There would be a minor right of way acquisition of 0.3 acres by Caltrans to facilitate the new alignment but this would not directly affect any man-made element of the NCTR.

As described in the National Register nomination for NCTR, the scenic and rugged setting outside the historic district boundaries, largely unchanged from the period of the line's original construction in 1865-69, contributes to the eligibility of the NCTR. A key concept, however, is that trees adjacent to the roadway and railroad have been cut down and regrown periodically, such as during initial construction of the NCTR and during construction and realignments or alterations of the highway. Alameda Creek Bridge was constructed in 1928 and does not contribute to the significance of the NCTR, and there are no other built resources outside the district's boundaries identified as contributing features of NCTR's setting. Caltrans concludes that the replacement of Alameda Creek Bridge would have no adverse effect to the historic district, unless that change substantially alters the scenic, rural, and rugged nature of the setting.

The proposed project would have an effect on the natural setting of the NCTR, but it would not be an adverse effect. Although trees and vegetation would be removed to allow construction of the new bridge, the views from the NCTR would remain substantially the same as the existing situation, with vegetation obscuring the views of the new bridge from the NCTR. The natural setting for 0.5 miles of NCTR's 11.6-mile length (4% of the total) would be slightly affected during construction. However, once remediation of the work area is completed through hydroseeding and regrading, the resulting setting would be almost indistinguishable from its current state. The new bridge would have a slightly higher profile than the existing bridge, but the railing and bridge type would be a similar

design to the original. The view of the new bridge would be likewise obscured from the historic district by vegetation.

The NCTR's integrity of setting would not be adversely affected due to the slight loss of right of way, the substantial retention of the pastoral viewshed, and the retention and replanting of vegetation screening the changes to the roadway from the NCTR. Caltrans is continuing consultation with the SHPO and the PLA on the determination that the proposed project would have no adverse effect on the NCTR.

Alameda Creek Bridge (#33-0036)
All Build Alternatives would have a substantial adverse change on the Alameda Creek Bridge. Although the Alameda Creek Bridge is not eligible for the NRHP nor does it meet the criteria for inclusion in the CRHR, the bridge is eligible to be listed on a local historic register. As a result, Caltrans is considering it to be a historical resource under CEQA. The proposed project would result in the loss of the Alameda Creek Bridge, a bridge identified as a historic resource potentially eligible for inclusion on the Alameda County Register.

All Build Alternatives would demolish the Alameda Creek Bridge resulting in a substantial adverse change in the significance of a historical resource. Design considerations to emulate the period appearance (1928) of the existing Alameda Creek Bridge Bridge railing are proposed as a context sensitive solution. The Texas Bridge Railing (Texas C412) and ST-70 are proposed as the bridge railing options for all Build Alternatives. The Texas Bridge railing is the preferred bridge railing option as this see-through bridge railing emulates the bridge railing of the existing Alameda Creek Bridge. However, the Texas Bridge Railing is not currently approved for use by Caltrans, and it is unknown if it will ultimately be approved for use on the Build Alternatives. The proposed Alameda Creek Bridge Replacement Project would result in a potentially significant impact that cannot be mitigated below a level of significance.

No known archeological resources are located in the project vicinity and the likelihood of encountering any archeological resources is minimal.

No-Build Alternative
The No-Build Alternative would not impact cultural resources.

2.1.5.4 Avoidance, Minimization, and/or Mitigation Measures
CULTURAL-1. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

CULTURAL-2. If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC, which will then notify the MLD. At this time, the person who

discovered the remains will contact Kathryn Rose, Branch Chief-Archeology so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

CULTURAL-3. Caltrans will investigate nearby locations that are suitable to place interpretive panels that discuss the history of transportation in Niles Canyon and the Alameda Creek Bridge's role in it. If Caltrans identifies a suitable location off the highway, interpretive panels will be installed. Caltrans will also prepare a brochure presenting this information to be placed in local libraries and historical societies.

CULTURAL-4. If approved for use by Caltrans, all Build Alternatives will select the Texas Bridge Railing (C412), a see-through bridge railing that emulates the bridge railing of the existing Alameda Creek Bridge. The use of C412 will be considered as partial mitigation for the loss of a historic resource.

CULTURAL-5. Recordation efforts documenting the Alameda Creek Bridge structure will occur prior to demolition activities.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

The CEQA checklist identifies use of the Federal Emergency Management's (FEMA) 100-year flood hazard and use of Federal Insurance Rate Maps (FIRMS) as the standard for evaluating impacts to hydrology and floodplains.

As a public agency that uses federal funds, Caltrans analyzes impacts to floodplains in accordance with Executive Order (11988). The EO requires an analysis of the practicability of alternatives to any longitudinal encroachments, risks of the action, impacts on natural and beneficial floodplain values, support of incompatible floodplain development, and measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

2.2.1.2 Affected Environment

The affected environment for the Hydrology and Floodplains analysis is defined as the project study limits on SR-84 from postmile 13.0 to postmile 13.6 as well as the project footprint needed to conduct the creek diversion, approximately 54 feet upstream of the old bridge footings (weir) and 54 feet downstream of the dripline of the existing Alameda Creek Bridge. Hydrology and floodplains information for this section is provided in the Alameda Creek Bridge Replacement Location Hydraulic Study (Caltrans, 2014f) and the Alameda Creek Bridge Replacement Project Geomorphic, Hydraulic, and Sediment Transport Study (Caltrans, 2014g).

Typical of watersheds in the central and southern California areas, the Alameda Creek watershed is characterized by seasonal variation in precipitation rates and is subject to periodic drought conditions. The Alameda Creek is intermittently perennial in the upper watershed areas and in the Sunol Valley, where the creek flows through broad channels

across deep, coarse alluvium, high infiltration rates result in dry reaches during the summer months. Many tributaries to Alameda Creek are historically intermittent and can be isolated from the mainstem by dry reaches beginning in the early to midsummer. In addition to fluctuations in-stream flows caused by varying levels of surface water runoff, flows in Alameda Creek tributaries also vary greatly with rising and falling water tables in the area (Caltrans, 2014g).

The U.S. Geological Survey (USGS) has maintained an active gaging station in the Niles Canyon portion of the watershed continuously since 1891. Comparisons of monthly averages over a 30-year period from the earliest records (1891 to 1921) and more recent records (1972 to 2007) indicate increased summer flows and decreased winter flows. This shift in the hydrologic regime is due to four major water impoundments in the watershed: Del Valle, Calaveras, and San Antonio reservoirs and the Alameda Creek Diversion Dam (San Francisco Planning Department, 2000).

Alameda Creek is managed by the Alameda County Flood Control and Alameda County Water Conservation District (ACFCD). The ACFCD plans, designs, constructs, and maintains flood control projects such as natural creeks, channels, levees, pump stations, dams, and reservoirs. The District is divided into nine zones; the Alameda Creek Bridge Replacement Project is located in Zone 5 which includes the City of Newark, Union City, the City of Fremont, Niles, Centerville, Decoto, and other surrounding areas of Alameda County. Beneficial Alameda Creek floodplain values include stabilizing the creek bank, providing habitat for terrestrial and aquatic wildlife, controlling erosion and sedimentation, and improving water quality by filtering pollutants. Floodplains are defined using FEMA FIRMS, which categorize floodplains into different Special Flood Hazard Areas:

> *Zone AE*: Floodplains identified as Zone AE represent areas with a one percent annual chance of flooding, where base flood elevations have been determined. Within a Zone AE floodplain, there are also regulatory floodway areas. A regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment, so that the one percent annual chance flood can be carried without substantial increases in flood heights.
>
> *Zone A*: Floodplains identified as Zone A represent areas with a one percent annual chance of flood inundation, where no base flood elevations have been determined.
>
> *Zone A0*: Floodplains identified in Zone AO represent areas within the one percent annual chance of flood inundation, with an average depth ranging from 1 foot to 3 feet.
>
> *Zone AH*: Floodplains identified as Zone AH represent areas within the one percent annual chance of flood inundation, with flood depths of 1 to 3 feet and base flood elevations determined.

According to the FIRMS, a portion of the proposed project is identified as being within Zone A, which represents areas with a 1% annual chance of flood inundation. The remainder of the project is located outside of the designated floodplain.

The hydrology and floodplain affected environment also includes the concrete bridge footings from a former Alameda Creek Bridge crossing, located approximately 150 feet upstream of the existing Alameda Creek Bridge. These bridge footings form a concrete weir, acting as a barrier across the Alameda Creek and altering Alameda Creek's natural flow characteristics. The weir spans the width of the low flow channel at the downstream face of the abandoned bridge footings.

2.2.1.3 Environmental Consequences

All Build Alternatives

A Location Hydraulic Study was prepared for Alameda Creek Bridge Replacement Project to evaluate project impacts to the Base Floodplain Elevation (BFE) (Caltrans, 2014f). The BFE is the computed elevation to which floodwater is anticipated to rise during the base flood.

Hydraulic model results estimated that all Build Alternatives would have similar impacts on the BFE. Caltrans' Office of Structure Hydraulics completed hydraulic modeling based on current draft roadway design cross sections developed for Build Alternative 3A as Build Alternative 3A was determined to have largest potential to impact the BFE. Based on the hydraulic modeling, Build Alternative 3A would result in an increase in BFE from near the proposed bridge (station 118+80) to the easterly project limits (station 134+80)[2]. Further east, it is estimated that this BFE increase would continue beyond station 134+80, dissipating for a distance of up to 2,000 feet. The maximum BFE increase is estimated to be 0.44 feet, at Station 130+20 (Caltrans, 2014f). Refer to Appendix D for project FIRMS and table explaining the increase in the BFE at various project stationing limits. It is anticipated that Build Alternatives 1, 2, and 3B would have a similar or lesser impact on the BFE than in Build Alternative 3A.

The increase in BFE for all Build Alternatives would be a nominal or insignificant increase, in that there is minimal potential for increased interruption or termination of the roadway's usefulness for emergency vehicles, minimal risk to life or property due to flooding, and no adverse impact on natural and beneficial floodplain values.

While all Build Alternatives would encroach on the BFE, all Build Alternatives would ultimately maintain or enhance beneficial floodplain values of the Alameda Creek by removing the existing Alameda Creek Bridge footings. Additionally, the project proposes to remove the remnant bridge footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration

[2] Stationing location identify specific places on engineering plans.

Agreement and CWA Section 404 and 401 permits. The removal of the weir would enhance floodplain values from existing baseline conditions by ensuring full fish passage through the project site, restoring the Alameda Creek to a more natural condition, and eliminating the backwater effect created by the weir. The backwater effect promotes warmer temperatures and slower flows in which invasive fish species in Alameda Creek, like carp and largemouth bass, thrive.

Approximately 1,500 cubic yards of sediment deposition is currently impounded by the concrete weir (Caltrans, 2014g). The removal of the weir would leave the impounded sediment in place to transport naturally downstream. Uncertainties associated with the removal of the weir include potential nuisance sediment deposits, potential release of sediment that could degrade water quality, and potential headcut migration upstream from the removal site. Additionally, a lower water level could desiccate adjacent wetland areas or affect listed species.

To predict the potential effects of releasing sediment stored at the weir on Alameda Creek and the flood control channel, the amount of sediment stored at the weir was compared to the total sediment load carried by Alameda Creek. It is estimated that the average annual sediment load transported by the Alameda Creek exceeds the amount of sediment impounded before the weir by a factor of 40 times (Caltrans, 2014g). Therefore, the total amount of sediment stored behind the weir is a relatively small proportion of the total sediment load transported on an annual basis.

Nonetheless, the release of the impounded sediment could constitute a potentially significant impact on the floodplains/hydrology of Alameda Creek. Mitigation measures to minimize the impact of releasing the impounded sediment on Alameda Creek were developed to achieve a less-than-significant impact on the floodplains/hydrology of Alameda Creek. Following the construction of the Alameda Creek Bridge and the removal of the weir, the mitigation measures HYDROLOGY-1-4 would be implemented to moderate and monitor the sediment pulse generated by removing the weir. The influence of sediment release on channel morphology and aquatic habitat would have a less-than-significant impact on Alameda Creek with the implementation of these mitigation measures and would most likely cause some adjustments that are within the range of natural variability. Sediment released from the weir would be dispersed over a period of several decades to the downstream reaches. There may be localized aggradation and in-filling of pools, but this would not be a long-term persistent condition. The dominant response of the channel is anticipated to be an enlargement of existing sediment storage features such as bars and natural river levees, and some deposition on the floodplain where the channel is less entrenched. These sediment storage features would moderate the sediment pulse released from the weir. The sediment pulse released from the weir is expected to disperse (Caltrans, 2014g). Based on an inspection of USGS particle size data in suspended and bedload sample at the Niles gage, the sediment size impounded the project site are within the size range of sediment sizes in the downstream channel and the sediment load transported by the Alameda Creek.

All Build Alternatives do not have the potential to interrupt or terminate a transportation facility needed for emergency vehicles or provides a community's only evacuation route, the project does not pose a significant risk to life or property, and the project does not pose a significant adverse impact on natural and beneficial floodplain values. Mitigation measures designed to reduce impacts if the stored sediment were released from the weir and naturally transported downstream on floodplains would ensure a less-than-significant impact. Through the implementation of minimization measures, there are no anticipated adverse impacts to species and/or habitat. There would be no significant or permanent adverse geomorphic, hydraulic, or floodplain impacts to the Alameda Creek as a result of the Alameda Creek Bridge Replacement Project.

While the release of the impounded sediment could constitute a significant impact on Alameda Creek's hydrology/floodplains, the Alameda Creek Bridge Replacement Project will have a less-than-significant impact to Hydrology/Floodplains with mitigation measures.

No-Build Alternative

The No-Build Alternative would not change existing conditions and would not impact floodplains. The No-Build Alternative would not remove the concrete weir structure in Alameda Creek and would not improve fish passage or the morphology of the Alameda Creek.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Following the construction of the Alameda Creek Bridge and the removal of the weir, the following measures are proposed to moderate and monitor the sediment pulse generated by removing the weir.

HYDROLOGY-1. Temporary Sediment Retention and Release: Implement temporary structure (such as plywood cofferdam or a weir constructed with large cobbles) to retain the impounded sediment. The structure will be designed to withstand low to medium flows that would minimally disperse the impounded sediment and potentially cause nuisance sediment deposits that could impede passage by fish and other aquatic organisms. The temporary structure would be designed to wash out (large cobbles) or be removed (plywood cofferdam) prior to a high flow event, allowing the high flow to disperse the sediment more evenly to downstream reaches.

HYDROLOGY-2. Staged Weir Removal: This measure consists of the gradual removal of the weir to minimize potential nuisance sediment deposits in downstream reaches. Portions of the weir would be selected for lowering or removal at any one time; the weir would be removed over the course of several years. This option allows the existing weir to moderate sediment dispersion and eliminates the need to construct a temporary structure.

HYDROLOGY-3. Draw Down Rate: Weir removal should accommodate the release of impounded water at a slow rate, taking place over the course of several days to minimize the risk of supersaturation and take of listed species. In addition, this measure would

reduce bank erosion associated with a pulse of water greater than the normal natural variation.

HYDROLOGY-4. Vegetative Stabilization: After the weir is removed and the water level drops, this measure would strategically plant vegetation species with vigorous growth habits to stabilize some of the sediment in place. Emergent vegetation species, such as cattail and bulrush, would be planted along the margin of the low flow channel, and riparian species, including willow, mulefat, California blackberry, and tall flatsedge, would be planted in the overbank areas. The intent of the vegetation would not be to permanently stabilize the sediment, as high flow conditions are likely to uproot new plantings and wash them downstream. Rather, the vegetation would be a temporary measure to mitigate the magnitude of the sediment pulse to downstream reaches. It is estimated that it would take approximately two to five years for the vegetation to have a stabilizing effect, so the performance of this option is uncertain.

2.2.2 Water Quality and Storm Water Runoff

2.2.2.1 Regulatory Setting

Federal Requirements: Clean Water Act

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The following are important CWA sections related to the Alameda Creek Bridge Replacement Project:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity 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 act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The Regional Water Quality Control Boards (RWQCB) administers this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and 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 allow a variety of minor project activities with no more than minimal effects. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it 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 exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed 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.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers 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. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program

<u>Municipal Separate Storm Sewer Systems (MS4)</u>

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans' MS4 permit covers all Caltrans right-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted. Caltrans' MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, 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 storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Caltrans' Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre (Caltrans, 2010b).

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

In addition to the above requirements, Caltrans projects under Region 2 jurisdiction, that require a Report of Waste Discharge to be submitted, need to incorporate post-construction stormwater treatment best management practices (BMPs) that treat stormwater runoff from an area equivalent to the project's added and reworked impervious surfaces, and comply with local hydromodification requirements within the political boundary of the municipality subject to a NPDES permit (Hydromodification Requirements for Alameda Permittees outlined in Attachment B within the Municipal Regional Stormwater Permit, Order No. R2-2009-0074).

2.2.2.2 Affected Environment

A Water Quality Study for the Alameda Creek Bridge Replacement Project (Caltrans, 2014h) was developed by the Office of Water Quality to determine existing water quality conditions and analyze how the project may impact water quality. In addition to the Water Quality Study, a Geomorphic, Hydraulic, and Sediment Transport Study for the Alameda Creek Bridge Replacement Project (Caltrans, 2014g) was produced to analyze the impacts of the proposed removal of the abandoned bridge footings and concrete wall located upstream of the existing Alameda Creek Bridge. The bridge footings and concrete wall currently impound water and sediment and prevent upstream migration by steelhead. As described in Chapter 1, the removal of the bridge footings and concrete wall is proposed as part of the Alameda Creek Bridge Replacement Project to serve as compensatory mitigation for impacts associated with the federal ESA consultation and CDFW 1602 and USACE CWA 404 and 401 permits.

The Alameda Creek Bridge Replacement Project is within the Alameda Creek watershed as well as the South Bay hydrologic unit, Alameda Creek Hydrologic Sub-Area (HSA) (204.30). The Alameda Creek is the receiving body for this project. The Region 2 Basin Plan establishes beneficial uses for waterways and water bodies throughout the region. Beneficial uses for Alameda Creek include Agricultural Supply, Groundwater Recharge, Commercial and Sport Fishing, Cold Freshwater habitat, Fish Migration, Preservation of

Rare and Endangered Species, Fish Spawning, Warm Freshwater Habitat, Wildlife Habitat, and Contact/Non-Contact Water Recreation. Alameda Creek discharges to the San Francisco Bay, which is approximately eight miles west of the project site. The Alameda Creek watershed area is approximately 40,500 acres, with an average annual rainfall of 21 inches. Runoff from much of southern Alameda Creek watershed is collected in Calaveras and San Antonio Reservoirs (ACWD, 2014). Runoff from much of the southeast portion of Alameda Creek watershed is collected in Del Valle Reservoir, some of which is diverted to ACWD via the South Bay Aqueduct. Runoff from the northern part of the Alameda Creek Watershed flows to Alameda Creek's tributaries, where the water is carried to ACWD facilities and used for groundwater recharge. CWA 303(d) listed water bodies within this HSA include Alameda Creek for the pollutant diazinon. Diazinon is commonly found in chemical used for landscaping and is released into water bodies as runoff from the irrigation of lawns and landscape areas in neighborhoods.

Typical of watersheds in the central and southern California areas, the Alameda Creek watershed is characterized by seasonal variation in precipitation rates and is subject to periodic drought conditions. The Alameda Creek is intermittently perennial in the upper watershed areas and in the Sunol Valley, where the creek flows through broad channels across deep, coarse alluvium, high infiltration rates result in dry reaches during the summer months. Many tributaries to Alameda Creek are historically intermittent and can be isolated from the mainstem by dry reaches beginning in the early to midsummer. In addition to fluctuations in-stream flows caused by varying levels of surface water runoff, flows in Alameda Creek tributaries also vary greatly with rising and falling water tables in the area (Caltrans, 2014f).

Water supply activities have substantially altered the hydrology of the watershed. ACWD purchases water from the State Water Project, and the deliveries flow through Vallecitos Creek and Niles Canyon into Fremont, where it is diverted into offstream groundwater charge ponds to prevent saltwater intrusion into the Niles Cone aquifer. The groundwater level within the project limits is estimated at the Alameda Creek's water elevation.

2.2.2.3 Environmental Consequences

All Build Alternatives

As described in the Chapter 1, all Build Alternatives would involve the installation of an Alameda Creek stream diversion to construct the new bridge and remove the existing structure. All Build Alternatives also propose the removal of old bridge footings located in Alameda Creek; the bridge footings serve as a barrier to fish passage. The removal of the old bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to serve as compensatory mitigation for impacts associated with the federal ESA consultation and the following permits: CDFW 1602, CWA 404, and CWA 401.

A stream diversion, occurring from June 1st to October 15th, would be implemented during each season to ensure a dry working environment while construction activities occur in Alameda Creek. The temporary creek diversion involves the installation of two dams: an upstream dam located 12-feet upstream of the concrete weir and a downstream

dam located 12 feet from the dripline of the existing Alameda Creek Bridge. Following the implementation of the creek diversion, any ponded water located in between the upstream dam and the downstream dam will be pumped out to create a dry working environment. The diversion of the Alameda Creek serves as an avoidance and minimization measure by minimizing impacts to water quality associated with column and foundation concrete operations and the export of sediment associated with disturbed soil areas. Creating a dry working environment for the column and foundation concrete operations and routing the creek around the construction area will minimize the potential for alkaline concrete materials to enter Alameda Creek. Similarly, impacts from the export of sediment associated with disturbed soil areas would be minimized by ensuring a dry working environment and no sediment deposition in the Alameda Creek from construction activities through implementation of Caltrans water quality BMPs (Caltrans, 2010b).

The installation and removal of stream diversion elements will result in the temporary discharge of sediment and a temporary increase in-stream turbidity. Impacts to water quality associated with the installation and removal of stream diversion will be short term and temporary occurrences that will not adversely impact Alameda Creek's water quality. Runoff from the new Alameda Creek Bridge would be collected on the bridge deck and directed to flow to the bridge approaches, which would allow for treatment by technologies, including bioswales or detention structures.

The project contains 1.2 acres of existing impervious area and removed impervious surface. Depending on which Build Alternative is selected, the project contains approximately 1.7 acres and 2.0 acres of added impervious area. The project would add over one-acre of pavement to the proposed project limits which will result in additional roadway runoff in the project limits. This could result in an impact on the stream's hydrologic regime, called hydromodification. Hydromodification refers to the changes in natural watershed hydrological processes and runoff characteristics caused by urbanization or other land use changes. These changes often result in increased stream flows and sediment transport, and can result in-stream bank erosion, leading to steep banks and the depositing of sediment downstream of the project. During construction, the project will disturb more than an acre of soil, which could allow large amounts of sediment to be discharged to receiving waters. The project will also include large amounts of fresh concrete for the construction of the bridge and realigned portions of SR-84. This has the potential to temporarily change the pH of receiving waters. Caltrans will incorporate stormwater treatment system(s) within the project to treat the roadway runoff to remove pollutants. Caltrans will consider best practice and best available technology (BAT) in selecting the stormwater treatment system during the design phase of the project. The stormwater treatment system is part of post-construction BMPs, which are described in Section 2.2.2.4.

To address treatment and hydromodification requirements, the preferred technology would be bioretention systems because these systems address both treatment and hydromodification. If possible, biostrips would be given preference because they can be

placed in the clear recovery zone (defined as an area clear of fixed objects adjacent to the traveled way).

The Alameda Creek Bridge Replacement Project's conceptual drainage consists of sheet flow down the side slopes with no new outfalls anticipated for drainage. However, the project would require new drainage outfall on the new western alignment to accommodate the bioretention systems. Bioretention systems would be located at approximately two locations along the realigned western approach to the Alameda Creek Bridge.

Consideration is also being given to an alternative outfall at the western alignment approach, which appears to be a natural depression with high infiltration capacity. This natural depression currently serves as an outfall for a large portion of runoff from the adjacent railroad embankment and beyond. This complication may render this natural depression unusable as a new outfall.

The runoff collection system off the roadway may consist of either dikes and downdrains or sheetflow down the side slopes to toe-of-slope ditches.

The proposed removal of the concrete weir will occur during the final construction season of the Alameda Creek Bridge Replacement project. Approximately 1,500 cubic yards of sediment deposition is currently impounded by the concrete weir (Caltrans, 2014g). The proposed strategy is to leave the impounded sediment in place to transport naturally downstream. The proposed weir removal and transportation of sediment naturally downstream will achieve full fish passage through the project site and will restore the Alameda Creek to a more natural condition compared to partial removal of the weir or installation of a fish ladder.

Uncertainties associated with the removal of the weir include potential nuisance sediment deposits, potential release of sediment that could degrade water quality, and potential headcut migration upstream from the removal site. Additionally, a lower water level could desiccate adjacent wetland areas or affect listed species. To predict the potential effects of releasing sediment stored at the weir on Alameda Creek and the flood control channel, the amount of sediment stored at the weir was compared to the total sediment load carried by Alameda Creek. It is estimated that the average annual sediment load transported by the Alameda Creek exceeds the amount of sediment impounded before the weir by a factor of 40 times (Caltrans, 2014g). Therefore, the total amount of sediment stored behind the weir is a relatively small proportion of the total sediment load transported on an annual basis.

The release of the impounded sediment could constitute a significant impact on Alameda Creek's water quality. However, with the implementation of mitigation measures, the influence of sediment release will not result in adverse impacts on channel morphology and aquatic habitat, and would most likely cause some adjustments that are within the range of natural variability. The Geormophic, Hydraulic, and Sediment Transport Study for the Alameda Creek Bridge Replacement Project inspected USGS particle size data in

suspended and bedload samples at the Niles gage to analyze the predicted impacts of a sediment pulse on Alameda Creek (Caltrans, 2014g). The results of the investigation indicated the sediment pulse released into the Alameda Creek is expected to disperse because the sediment size impounded at the weir are within the size range of sediment sizes in the downstream channel and the sediment load (Caltrans, 2014g). Sediment released from the weir would be dispersed over a period of several decades to the downstream reaches. Some sediment is also likely to deposit on the channel bed, and there may be some channel aggradation and filling of some pools. None of these sediment storage features are considered to be long-term sediment storage sites (more than 100 years), but they will all function to moderate the sediment wave as it moves downstream. Over the long-term, it is anticipated that nearly all of the sediment released from the project site would reach the flood control channel.

All Build Alternatives for the Alameda Creek Bridge Replacement Project would temporarily impact water quality during the construction of the new bridge and demolition of the existing Alameda Creek Bridge, however, with measures set forth in the state and federal permits and regulatory schemes described above, which are standard features of every Caltrans project, no long-term adverse impacts to water quality are expected. Although all Build Alternatives would result in an increase in paved surface in the project area, the stormwater treatment system, either a biorention system or biostrips, selected during the design phase of the project would address both water treatment and hydromodification requirements. The storm water system would remove pollutants from the water runoff to ensure a less-than-significant impact to water quality in the project area.

The proposed removal of the concrete weir will have temporary impacts associated with sediment dispersal through Alameda Creek, however, the long term impacts of the weir's removal will promote beneficial uses of Alameda Creek. These beneficial uses include ensuring full fish passage through the project site, restoring the Alameda Creek to a more natural condition, and eliminating the backwater effect created by the weir. The backwater effect promotes warmer temperatures and slower flows in which invasive fish species in Alameda Creek, like carp and largemouth bass, thrive. Some sediment is also likely to deposit on the channel bed in addition to some channel aggradation and filling of pools. None of these sediment storage features are considered to be long-term sediment storage sites (more than 100 years), but they will all function to moderate the sediment wave as it moves downstream. Over the long-term, it is anticipated that nearly all of the sediment released from the project site would reach the flood control channel. As identified above

The removal of the concrete weir and the release of the impounded sediment into Alameda Creek could constitute a potentially significant impact on water quality. However, with the implementation of mitigation measures, the proposed Alameda Creek Bridge Replacement Project will result in no significant impact to water quality.

No-Build Alternative
The No-Build Alternative would not change existing conditions and would not impact Water Quality.

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

In addition to the measures listed below, the mitigation measures identified in Section 2.2.1.4 (HYDROLOGY-1-4) also apply as water quality mitigation measures.
WATER-1. A stream diversion will be installed during construction to minimize the export of sediment and pH issues from disturbed soil areas and fresh concrete in work areas within the streambed. Sediment would be exported during removal of the weir and from haul roads in the creek. PH would come from concrete during construction of the bridge piers. Diversion facilitates the detention and testing of groundwater resulting from the drillings of holes for pile foundation in the creek bed.

WATER-2. In accordance with SWRCB CGP (Order No. 2012-006-DWQ), water samples will be taken upstream and downstream of the Alameda Creek Bridge Replacement Project to establish a baseline to limit the amount of pollutants that leave the project site.

WATER-3. A SWPPP will be required that presents that strategy for implementation of temporary constructions site BMPs. The SWPPP will be prepared by the contractor and approved by Caltrans.

WATER-4. Stockpile areas for construction materials, equipment, and debris will be minimized to avoid the removal of riparian and upland vegetation.

WATER-5. Caltrans' Standard BMPs will be implemented to avoid or minimize the discharge of pollution during and after construction to the maximum extent practicable. In general, these BMP's are grouped by the following categories:

- Design Pollution Prevention BMPs: These BMPs are permanent measures designed mainly for purposes other than Water Quality that improve stormwater quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Design Pollution Prevention BMPs may include riprap for drainage improvements. Erosion control measures will be provided on all disturbed areas.
- Temporary Construction Site BMPS: these BMPs are implemented throughout the duration of construction activities, in order to avoid and minimize pollutant loads in potential stormwater/non-stormwater discharges. Construction Site BMPS strategies applicable to this project may include the followings:
    - Soil Stabilization: scheduling, preservation of existing vegetation, slope protection, slope interrupter devices, and channelized flows;
    - Tracking Controls: stabilized construction entrance and exist;
    - Wind Erosion Controls: temporary covers;
    - Non-Stormwater Management: vehicle and equipment operations (fueling, cleaning and maintenance), and material and equipment use;

  - Waste management and Materials Pollution Control: concrete wash-out, material delivery and storage, material use, stockpile management, spill prevention and control, soil waste management, hazardous waste and/or contaminated soil management, liquid waste management and lead abatement and containment.
- Permanent Treatment BMPs: These BMPs are permanent water quality controls measures used to remove pollutant from stormwater runoff prior to being discharged from Caltrans right of way. Treatment BMPs are permanent devices and facilities treating stormwater runoff. Typical Treatment BMPS are biofiltration strips or swales with or without soil amendment, infiltration, basins, and media filters, litter capture devices.
- Hydromodification Management (HM) Controls: These controls are permanent measures used to control increases in peak runoff flow and volume from the project's new impervious surfaces to minimize erosion in downstream water courses. HM controls include volume-based flow control structures. As this project is subject to both stormwater treatment and HM requirements, cost-effective BMPs/controls will be designed, where feasible, to meet both these requirements.

  The Water Board stipulates treatment and hydromodificaton requirements on project by project basis. The San Francisco Water Board typically accepts bioretention systems for addressing hydromodificaton. These provide storage for runoff that helps to attenuate peak flows and maintain an acceptable flow-duration regime. Right of Way requirements along the Niles Canyon corridor would make the use of bio-retention systems challenging. Other solutions that may help to overcome these challenges would include infiltration trenches and enlarged drainage pipes.

2.2.3 Geology/Soils/Seismic/Topography

2.2.3.1 Regulatory Setting

Topographic and geologic features are protected under CEQA.

2.2.3.2 Affected Environment

A District Preliminary Geotechnical Design Report for the Alameda Creek Bridge Replacement Project was prepared by Caltrans Office of Geotechnical Design – West (Caltrans, 2014i) to present existing geologic and geotechnical information. This section discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans' projects. Structures are designed using the Caltrans' Seismic Design Criteria (SDC). Caltrans' SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please refer to Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Geology

Regional Geology

Alameda County is located at the northern end of the Diablo Range of Central California. The project is located within the Coast Range Geomorphic Province of Central California. Niles Canyon is characterized by sedimentary rocks of the Upper Cretaceous Panoche Formation, which is part of a thick sequence of the Great Valley Sequence. The Great Valley Sequence is a group of related geologic formations that are known to preserve fossils. Quaternary surficial deposits overlay Panoche Formation rocks in and adjacent to the present-day channel of Alameda Creek.

The Panoche Formation exposed in the walls of Niles Canyon is generally well-bedded and composed predominately of micaceous shale, with minor interbedded sandstone and local conglomerates. The Panoche Formation is locally folded and faulted, with the fold axes and faults generally striking parallel to bedding (northwest).

Site Geology

The proposed project is located near the western end of Niles Canyon. The canyon is deeply incised and relatively narrow in this area, and steep canyon walls rise approximately 800 to 1,300 feet on both sides of Alameda Creek in the vicinity of the project area. The project area contains two sedimentary units, both Cretaceous in age and separated by high angle reverse fault. The two rock units are unnamed sandstone and shale (Ks), cretaceous and unnamed sedimentary rocks (Ku), late cretaceous.

Over the course of millions of years, the flowing Alameda Creek has deposited clay, silt, sand, and gravel, also known as native alluvium, throughout Niles Canyon. There is a sequence of alluvial terraces at the project location that include a low inset terrace, approximately 10-20 feet above the creek level, and a broader terrace approximately 15-20 feet above the level of the creek. The terrace surface is generally composed of clay-like sand with gravel and is littered with cobbles and local boulders. The native alluvium is composed of sand with clay and sandstone cobbles that are sub-angular to rounded, up to 1.5 feet in diameter.

The bedrock or consolidated rock underneath the soil surface consists predominately of micaceous shale with interbedded sandstone and local conglomerate of the Upper Cretaceous Panoche Formation. Bedding strikes northwest, and dips steeply to the south and southwest. Shale is laminated to very thinly bedded (beds range up to 0.1 feet thick), soft to slightly hard, friable, and intensely weathered. Fractures in the shale are closely spaced (less than 0.1 feet). Sandstone is thickly bedded moderately- to steeply-dipping with interbedded shale. The sandstone is moderately hard, medium strong, and moderately weathered. Fractures are generally moderately spaced (0.3 to 3 feet).

The stream channel deposits exposed in and around the active stream channel consist of slightly silty sand with cobbles and boulders. Generally sub-rounded cobbles-and boulder-sized clasts of sanstone comprise the majority of the deposits (approximately 60-70%). The edges of the active stream include braided channels and gravel bars. The

bottoms of many of these braided channels were covered with a thin deposit of silt and sand.

Soils

The two soil units in the project area are the Los Gatos-Los Osos Complex and rock land. The majority of the project area is covered by Los Gatos-Los Osos Complex soil unit, which is approximately 45-75% eroded. The Los Gatos-Los Osos complex is broken down into three soil types or loams: Los Gatos loam making up about 40% of the complex, the Los Osos silty clay loam constituting approximately 40% of the complex, and the Gaviota rocky sandy loam making up 20% of the complex. The Los Gatos-Los Osos soil unit is formed from interbedded sandstone and shale. The surface soil is dark-brown, neutral loam. It is hard and massive soil when dry, but in the upper five inches, it is slightly hard and has moderate subangular blocky structure. The part of the subsoil is neutral, reddish-brown heavy loam. The lower part is brown, slightly acid loam. Both parts are massive and slightly hard when dry. Los Gatos-Los Osos Complex has very rapid runoff, and the erosion hazard is very severe.

The second soil unit in the project area is rock land. Rock land occurs throughout the uplands and consists of very steep, rocky areas. This land type has a thin surface layer and is similar to the Los Gatos-Los Osos Complex in that erosion is critical for rock land.

Erosion/Slope Stability

The entire Niles Canyon corridor is notorious for having numerous areas of rock fall and landslides. The Alameda Creek Bridge Replacement project area is covered by soils that characterized by very severe to severe erosion hazard. Both Los Gatos-Los Osos Complex and rock land soil units are highly sensitive to disturbance and are highly erodible under several land use situations, including cultivation and grazing. Most cultivated soils have eroded because of slope and the agricultural methods used. The highest erosion ratings are generally correlated to slope angle, with very severe erosion hazards for soils on slopes steeper than 3:1, regardless of parent material. The Los Gatos-Los Osos Complex has severe erosion hazard even at lower slope angles

Seismic

Northern California is within the most tectonically active area of the North American continent as this is where the North American Plate and the Pacific Plate grind past one another along the San Andreas Fault. This has created a series of semi-parallel faults that cover the Bay Area. The active faults located near the project site are the Calaveras, Pleasanton, and Hayward faults. These northwest–striking, right-lateral strike-slip faults have been the source of numerous historic earthquakes, and are considered active faults. No faults are located within the immediate project vicinity, however, the Hayward fault is approximately 3.1 miles to the west of the project site while the Calaveras and the Pleasanton faults are located 3.0 and 4.8 miles, respectively, east of the project.

The following table lists the distance from the project to nearby active faults, the fault type, as well as the maximum earthquake magnitude expected from each of the listed faults:

Table 9. Fault Data

FAULT	DISTANCE FROM PROJECT (MILES)	FAULT TYPE	MAXIMUM MAGNITUDE (MMAX)
Calaveras	3.0	Strike Slip	6.9
Hayward	3.1	Strike Slip	7.3
Pleasanton	4.8	Strike Slip	6.6

The Calaveras, Hayward, and Pleasanton faults are described in more detail below.

Calaveras fault

The Calaveras Fault is located approximately three miles from the project site. The Calaveras Fault is the dominant fault in the area. The Calaveras has a vertical component responsible for the upward movement of the west side of the fault. It is one of the major right-lateral strike-slip faults in California. It has been mapped from Hollister on the southeast to San Ramon on the northwest, a distance of approximately 70 miles (Caltrans, 2014i).

It is classified as a historically active fault. Major earthquakes have occurred along this fault since 1800, including a 1948 earthquake centered about 16 miles east of Watsonville at Coyote Dam (with Richter magnitude of 6.2), and a 1911 earthquake centered east of San Jose (with a Richter magnitude of 6.6). The fault crosses the Hetch Hetchy Aqueduct at Calaveras Road on east flank of Sunol Valley (Sunol / Nile Dam Removal, 2005).

There is an 18% probability of a Magnitude 6.7 earthquake occurring on the Calaveras Fault before 2030 (Caltrans, 2014i).

Hayward fault

The active Hayward Fault is right lateral, strike–slip fault, crosses SR-84, approximately three miles west the project area. The Hayward Fault extends from Point Pole Regional Shoreline southward to Milpitas and beyond; it is a part of San Andreas Fault system. The Hayward Fault has several large damaging earthquakes in historical times. Two of these, in 1836 and 1868, left large surface ruptures near the project area.

Hayward Fault is a part of Hayward-Rodgers Creek segment, which has a 32% probability of a Magnitude 6.7 Earthquake occurring on Hayward Fault before 2030 (Caltrans Geotechnical Design Report, 2014).

Pleasanton Ridge and Sunol Ridge

During the past five million years, most of the areas of the present Coast Ranges, including Pleasanton and Sunol ridges, have uplifted. Geological faulting intensified, causing sedimentary strata (the erosion deposits of an earlier time) to fold, overturn, and break up. Parallel faults lie on both sides of Pleasanton Ridge, the Stonybrook/Palomares Fault to the west, and the Calaveras and Sunol Faults to the east.

Potential Seismic Hazards

The site may be affected by activity along any of the active faults discussed above. Earthquake induced hazards can be divided into primary and secondary seismic effects. Primary seismic effects resulting from differential movement along a fault trace, such as ground rupture or surface deformation, are not expected occur because no faults intersect the project area.

Secondary seismic effects result from various soil responses to ground acceleration. These effects result from activity of any nearby active faults. Secondary seismic effects may include liquefaction of natural ground, ground shaking, and cracking, all of which are described below.

Liquefaction of Natural Ground

Liquefaction occurs when a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, such as earthquake shaking or sudden change in stress condition, causing the soil to behave like a liquid. Within the Alameda Creek Bridge Replacement Project area, the potential for liquefaction is considered very high in the stream channel while the remaining portion of the project area is considered to have moderate potential for liquefaction.

Ground shaking

The site is expected to undergo varying intensities of ground shaking in response to local earthquake events. According to the Association of Bay Area Governments (ABAG), the potential intensity of ground shaking for the project limits is classified as "Violent" ground at the site is not considered unstable and therefore, structures built to the requirements of latest uniform Building Code would be expected to withstand the ground shaking induced by earthquake.

Cracking

Lurch cracks may develop in the silty and clay-like soil overlying the site. The potential for lurch cracking will be higher in the rainy periods when the soil is saturated. The hazard from cracking is considered minimal.

Topography

The project is located in Niles Canyon, an area with a steeped-walled gap in the East Bay hills that connect Sunol Valley with the San Francisco Bay depression. SR-84 parallels the Alameda Creek through Niles Canyon. Niles Canyon is a relatively narrow, deep incised valley that meanders through the local Coast Ranges. Northwest – trending ridges (Pleasanton Ridge and Sunol Ridge) and valleys control the relief of the Alameda Creek watershed.

The Sunol Valley is traversed by Alameda Creek. Downstream of Sunol Dam, which is located within the Sunol Valley, the creek meanders to the south as it enters Niles Canyon. Steep slopes that rise to about 400 feet above the creek border the southwest side of Alameda Creek in this area. A broad, alluvium-filled terrace borders the northeast side of the creek.

Review of a site topographic map indicates that the ground surface of the alluvium is approximately 10 to 15 feet above the water level in Alameda Creek. Artificial fill has been used to construct portions of Niles Canyon Road (SR-84). Alameda Creek and its tributaries drain most of the watershed in Alameda County area.

Alameda Creek receives the drainage from Calaveras and San Antonio Creeks upstream from its confluence with Arroyo de la Laguna. Below its confluence with Arroyo de la Laguna, Alameda Creek flows in a westerly direction through Niles Canyon, traverses the Niles Cone area, and discharges into San Francisco Bay (Caltrans, 2014i).

Groundwater

There are three main ground water basins in Alameda County area. These are the Livermore and Sunol Valleys, both within Diablo Range, and alluvial plain along the easterly shore of San Francisco Bay. The project area is located within Sunol Valley Basin (Sunol Valley Unit). The highlands of the Diablo Range are generally non-water bearing. Water-bearing formation in the Sunol Valley are the same as those in Livermore Valley, being late Quaternary alluvium and the underlying Tertiary-Quaternary Livermore gravels. The alluvium deposits range from the surface to 60 feet below the ground surface. The upper aquifer in the alluvium is "unconfined" meaning the water table fluctuates in response to recharge and discharge. There are limited data with respect to number and yield wells in Sunol Valley Basin (Caltrans, 2014i). The groundwater levels within Niles Canyon can be assumed to be at creek level.

2.2.3.3 Environmental Consequences

All Build Alternatives

The soils located at the project site are subject to severe erosion; project construction activities such as grading and excavation, could impact the stability of existing soils and increase the overall potential for soil erosion. During construction, erosion causes sedimentation problems in storm drains, remove top soils, create gullies on slopes and undermine engineered fills beneath foundations or roadways. Appropriate avoidance and minimization measures for water quality, as described in Section 2.2.2.4, will be implemented to minimize soil erosion and avoid impacting the stability of existing soils for all Build Alternatives.

All Build Alternatives will be constructed in a seismically active region. However, according to the Alquist-Priolo Earthquake Fault Zone Maps, the project location is not located within a special studies zone. The project will be constructed in an area where the surface soil erosion is severe, however, the underlying geology of the area is completely rock. The nearest fault is located three miles from the project limits; no potential exists for primary seismic impacts, such as the surface fault rupture. All Build Alternatives have a high potential for liquefaction within the stream channel while the surrounding project limits have moderate potential for liquefaction. During an earthquake, there is potential for lurching and cracking, however, considerations will be taken during the design phase to address potential seismic impacts. Caltrans' structures are designed using the Caltrans' Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. The Alameda Creek Bridge Replacement

design incorporates features to reduce impacts as a result of geologic and seismic conditions. These design features include, but are not limited to, designing the new Alameda Creek Bridge to withstand a defined level of bedrock acceleration and driving piles below liquefiable layers.

Groundwater is approximately close to the creek surface in the vicinity of the creek. If needed, groundwater may need to be pumped out, treated, and taken offsite, depending on the CIDH pile design for the selected Build Alternative. Groundwater is not anticipated to be impacted by the rock cuts proposed for Build Alternatives 3A and 3B.

All Build Alternatives will cut into natural landmarks and landforms, however, no adverse impacts to natural landmarks or landforms are anticipated.

In the event of an earthquake, construction workers will be exposed to shaking, lurching, and cracking during the construction of the Alameda Creek Bridge. All Build Alternatives will not expose the traveling public to any new geologic hazards using existing baseline conditions and will not result in the project area being more susceptible to erosion or geologic hazards.

Build Alternatives 3A and 3B

Build Alternatives 3A and 3B involve rock cuts for the eastern approach to the Alameda Creek Bridge in shale and sandstone of the Panoche Formation. Rock cut slope design relies heavily on surface mapping, geomaterial identification, and discontinuity logging. Logging rock structure discontinuities (bedding and fracture/joint patterns) and their condition in boreholes and mapping them on surface outcrops is essential to rock cut slope design, as discontinuities strongly influence rock slope stability. In the event that Build Alternative 3A or Build Alternative 3B is selected as the preferred alternative, a field investigation will be completed during the design phase with field mapping and geotechnical drilling and sampling (with at least two horizontal borings completed in the vicinity of the cut) to ensure the rock cut will not destabilize the slope. The rock cuts associated with Build Alternatives 3A and 3B are not anticipated to increase slope instability or result in slope failure. The geological formation proposed for rock cuts is mapped as having bedding with a strike of approximately 310 degrees and a dip to the southwest of between 50 to 80 degrees. This dip is into the face of the slope giving the slope more stability and lessens the cuts impact on the slope's stability.

Build Alternatives 1, 2, and 3A

Build Alternatives 1, 2, and 3A involve the construction of retaining walls and soil-nail walls; should Build Alternative 1, 2, or 3A be selected as a the preferred alternative, special consideration will be taken during the design process of these walls should the ground acceleration exceed 0.6g.

All Build Alternatives will have a less-than-significant impact to Geology/Soils/Seismic/Topographic resources.

No-Build Alternative
The No-Build Alternative would not impact Geology/Soils/Seismic/Topography.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures
GEOLOGY-1. For Build Alternatives 3A and 3B, Caltrans will examine top of the wall treatments to minimize ground disturbance above rock cuts.

2.2.4 Paleontology
2.2.4.1 Regulatory Setting
Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

California Environmental Quality Act
Under California law, paleontological resources are protected by CEQA. CEQA requires that a determination be made as to whether a project would directly or indirectly destroy a unique paleontological resource or site or a unique geological feature (CEQA Guidelines, Appendix G (V)c).

Public Resources Code §5097.5
California PRC §5097.5 prohibits "excavation or removal of any vertebrate paleontological site, or any other archeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands". Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

2.2.4.2 Affected Environment
The affected environment is established as SR-84 from postmile 13.0 to 13.6. Paleontological information is based on the District Preliminary Geotechnical Report for Alameda Creek Bridge and the Paleontological Identification Report (PIR) (Caltrans, 2014j) prepared for this project by the Office of Geotechnical Design-West. Background research for this project consisted of a literature review, map review, fossil locality search, and a search of Caltrans Log of Test Borings (LOTB) and As-Built plans. This research identified the geologic units, previous paleontological studies, fossil localities (location of paleontological resources that have been documented), and types of fossils in geologic units that may be within or adjacent to the project area.

The proposed project is located near the western end of Niles Canyon. The canyon is deeply incised and relatively narrow in this area, and steep canyon walls rise approximately 800 to 1,300 feet on both sides of Alameda Creek in the vicinity of the project area. The project is located within the Coast Range Geomorphic Province of Central California. Niles Canyon is characterized by sedimentary rocks of the Upper Cretaceous Panoche Formation, which is part of a thick sequence of the Great Valley Sequence. Quaternary surficial deposits overlay Panoche Formation rocks in and adjacent

to the present-day channel of Alameda Creek. According to the University of California Museum of Paleontology (UCMP) some of the geologic units in the project area, specifically the Panoche Formation of Upper Cretaceous, the Great Valley Sequence undivided sandstone and siltstone, and the Quaternary deposit of Niles Canyon, could yield fossils.

The UCMP online catalog contained four fossil listings for Cenozoic-age Panoche Formation fossils in Alameda County, two invertebrate and two plant fossils. Neighboring Contra Costa County has invertebrate, plant, and vertebrate fossils. The UCMP lists six invertebrate fossils in San Joaquin County. Vertebrate fish fossils have been found at a single location in San Joaquin County in the Panoche Formation. Since Holocene aged fossils are considered too young to be scientifically relevant, no search was conducted for the stream deposits.

2.2.4.3 Environmental Consequences

All Build Alternatives

As described above, the proposed project is located in an area with geologic units containing high sensitivity for producing paleontological resources. Specific locations of paleontological resources are unknown and impacts cannot be quantified or determined until construction begins. Construction activities could impact paleontologically sensitive geologic units when vehicles or other work equipment impact previously undisturbed sediments by excavating, grading, or crushing bedrock exposed in or underlying a project. This could result in impacts to fossils by destroying them or otherwise altering them in such as a way that their scientific value is lost.

All Build Alternatives include a wide range of construction elements; however, activities involving excavation or ground disturbance have the greatest potential to adversely affect paleontological resources. All Build Alternatives include excavation activities involving the extension of ten foot in diameter CIDH concrete piles into the Panoche Formation. The actual depth of a CIDH is dependent on subsurface conditions and will be calculated during the design phase. Shallow excavation will be done to construct abutments. Although construction and ground disturbing activities in the streambed will extend into the Panoche Formation, activities in the streambed are unlikely to impact paleontological resources as Holocene aged fossils are considered too young to be scientifically relevant.

All ground disturbing activities associated the construction of the project's eastern approach will impact the Panoche Formation. Paleontological resources within the Panoche Formation could exist at any layer or depth of ground disturbing activities; as result, impacts to paleontological resources are approximately the same for each Build Alternative as all Build Alternatives involve ground disturbing activities in this formation. It is not possible to quantify and compare the impacts of each Build Alternative when specific locations of paleontological resources are unknown. As a result, the proposed project has the potential to significantly impact paleontological resources. However, with the implementation of a Paleontological Mitigation Plan (PMP) that will define specific mitigation measures and methods in the event that paleontological resources are

discovered, project impacts to paleontological resources will be less than significant with mitigation.

No-Build Alternative
The No-Build Alternative would not impact paleontological resources.

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

PALEONTOLOGY-1: A PMP defining specific mitigation measures and methods, will be prepared and implemented before construction begins. The PMP may include:

- The presence of the Principal Paleontologist at pre-construction meetings to consult with the construction contractor.
- Paleontological awareness training for construction workers to be provided for by the Principal Paleontologist.
- Monitoring of ground disturbing activities such as excavation by the paleontological monitors, to be conducted under the supervision and/or at the direction of the Principal Paleontologist.
- Temporary halting or diversion of construction activities in areas where fossils are discovered.
- Preparation, sorting, and cataloging of fossils collected during the monitoring and salvage. Fossils are prepared to the point of identification, not display.
- Curation of fossils, along with copies of all pertinent field notes, photos, and maps at a curation facility acceptable to Caltrans.
- Preparation of the Paleontological Mitigation Report to document the results of the mitigation program.

2.2.5 Hazardous Waste/Materials

2.2.5.1 Regulatory Setting

Hazardous materials including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as “Superfund,” is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean-up of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

2.2.5.2 Affected Environment

The hazardous waste/material affected environment is defined as the entire project limits, SR-84 from postmile 13.0 to 13.6.

The Site Investigation Report, State Route 84, Alameda County California (Caltrans, 2004a) for Caltrans' SR-84 Niles Canyon Widening Project was used to assess the probable levels of aerially deposited lead (ADL) in the Alameda Creek Bridge Replacement Project vicinity. Based on soil testing conducted throughout the Canyon, it is predicted that the project soils have fairly low levels of ADL.

There are no known hazardous waste sites within the project area that could negatively affect the project and no presence of contaminated properties listed under Section 65962.5 of the CA Government Code (also known as the Cortese list) including, but not limited to, lists of hazardous waste facilities, land designated as hazardous waste property, and hazardous waste disposal sites. Additionally, there is no evidence of naturally occurring asbestos in the project limits.

The existing Alameda Creek Bridge structure, constructed in 1928, likely contains asbestos-containing material (ACM) and lead based paint (LBP). Surface soils under the existing bridge's steel elements may have high levels of lead due to deposition of flakes of lead-based paint generated during routine bridge repainting and maintenance over the past nine decades.

2.2.5.3 Environmental Consequences

All Build Alternatives

All Build Alternatives involve ground disturbing activities within the same project area and propose to remove the existing Alameda Creek Bridge; hazardous waste and materials impacts are the same across all Build Alternatives. Construction activities involve ground disturbance and could disturb soils containing ADL. Based on previous site investigations for other projects in the Niles Canyon corridor, it is anticipated that the Alameda Creek Bridge Replacement project soils have fairly low levels of ADL. All Build Alternatives propose the reuse of excavated material for bridge embankment construction without generating surplus excavated materials. If the project design shows that construction would result in a surplus of excavated material, a site investigation would be conducted to characterize the soil. Materials found to contain lead at concentrations above those considered potentially hazardous to either human health or the environment would be handled in accordance with all local, state, and federal rules and regulations and appropriate measures included in the Alameda Creek Bridge Replacement Project's plans and specifications package.

All Build Alternatives propose to remove the existing Alameda Creek Bridge following the construction of the new bridge and realignment of SR-84. The existing Alameda Creek Bridge structure likely contains ACM and LBP. A LBP survey for the existing bridge would be conducted during the project's design phase to plan and develop hazardous materials-related construction specifications. Although surface soils underneath the existing bridge may contain higher levels of lead due to deposition of LBP flakes, the project does not propose to remove or disturb surface soil from the banks under the existing bridge.

Additionally, a survey of the bridge for ACM would be completed prior to demolition to assess asbestos requirements related to bridge removal. The findings from the bridge surveys will be used to develop appropriate hazardous materials-related construction specifications. All Build Alternatives will have a less-than-significant impact to hazardous waste/materials.

No-Build Alternative

The No-Build Alternative would not impact hazardous waste/materials.

2.2.5.4 Avoidance, Minimization, and/or Mitigation Measures

HAZ-1. If the project design shows that construction will result in a surplus of excavated material, a site investigation will be conducted to characterize the soil.

HAZ-2. Materials found to contain lead at concentrations above those considered potentially hazardous to either human health or the environment will be handled in accordance with all local, state, and federal rules and regulations and appropriate measures included in the Alameda Creek Bridge Replacement project's plans and specifications package

HAZ-3. A LBP survey and an ACM survey for the existing Alameda Creek Bridge structure will be conducted during the project's design phase to plan and develop hazardous materials-related construction specifications.

2.2.6 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels)[3].

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing travel activity), 3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued cooperatively. [4]

2.2.6.1 Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and pro-active approach to dealing with GHG emissions and climate change.

[3] http://climatechange.transportation.org/ghg_mitigation/
[4] http://www.fhwa.dot.gov/environment/climate_change/mitigation/

Assembly Bill 1493 (AB 1493), Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order S-3-05 (EO) (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to: 1) year 2000 levels by 2010, 2) year 1990 levels by the 2020, and 3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by the year 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (CARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391) Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Federal

Although climate change and GHG reduction are a concern at the federal level; currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the FHWA has issued explicit

guidance or methods to conduct project-level GHG analysis.[5] FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process, from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and EO 13514 - *Federal Leadership in Environmental, Energy and Economic Performance*.

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also direct federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions. U.S. EPA in conjunction with NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.[6]

The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

[5] To date, no national standards have been established regarding mobile source GHGs, nor has U.S. EPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.
[6] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, U.S. EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary U.S. EPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

2.2.6.2 Project Analysis

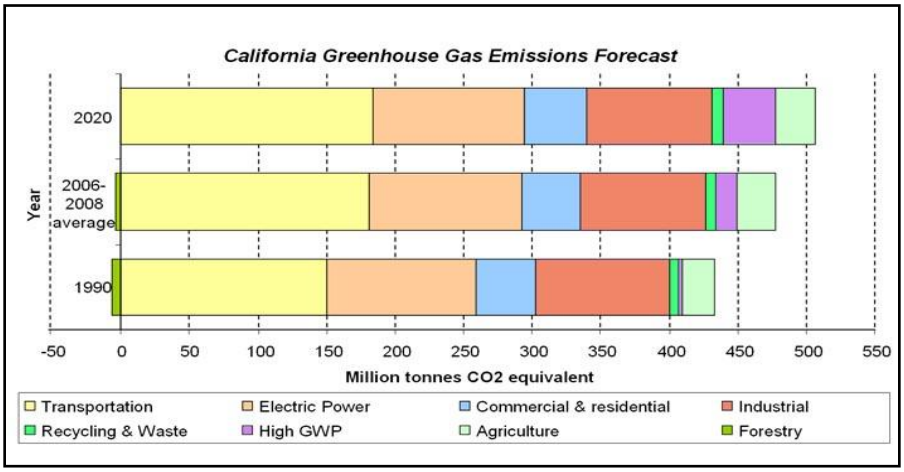
An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.[7] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The

[7] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Figure 27. California Greenhouse Gas Forecast



Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.[8]

The purpose of the proposed Alameda Creek Bridge Replacement Project is to correct most deficiencies associated with the existing facility and to improve traffic safety of the Alameda Creek Bridge for all transportation modes. This project is exempt from regional and project-level air quality conformity requirements under 40 CFR 93.126 as it is to reconstruct a bridge with no additional travel lane/lanes (see §93.126, Table 2 – Exempt Projects). The proposed bridge replacement would not create or alter roadway intersections where localized hot-spots mostly likely to occur. The proposed project would not cause exceedances or new violations of the National or California Ambient Air Quality Standards.

The new facility would smooth out the alignment of the western approach to the Alameda Creek Bridge to achieve better sight distance. All Build Alternatives would result in the removal of the existing speed advisory signs that recommend that the existing bridge be driven at 30 mph going eastbound and 35 mph going westbound, as the replacement bridge can be driven safely at the existing 45 mph regulatory speed limit for this section of SR-84. Traffic smoothing strategies that reduce the number and intensity of

[8] Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

acceleration and deceleration events (for instance variable speed limits) is an improvement in managing traffic operations that can reduce CO2 emissions (Barth, et. al., 2009). The new alignment of all Build Alternatives would allow for a more continuous speed flow, thereby, avoiding the need to slow vehicular speed to accommodate the change in highway geometry, potentially reducing vehicular CO2 emissions. Providing a smoother alignment and a more continuous speed flow at this location may result in a decrease in green house gas emissions. The proposed project would not add capacity to the Alameda Creek Bridge and is not anticipated to have an increase in operational greenhouse gas emissions

Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

The proposed project would generate air pollutants during the construction period, which is expected to last a total of three years. Trucks and construction equipment emit hydrocarbons, oxides of nitrogen, carbon monoxide and particulates associated with grading, hauling and various other activities. The impacts from the above activities are considered temporary and would vary from day to day as construction progresses.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

CEQA Conclusion

Although construction emissions are unavoidable and are expected to be minimal, the proposed project will not increase capacity of the State Highway System and is not expected to result in additional operational CO2 emissions. However, it is Caltrans' determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

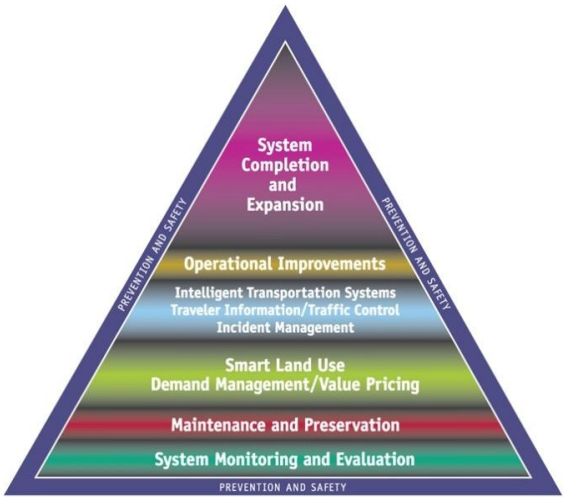


Figure 28. Mobility Pyramid

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy.

The Strategic Growth Plan relies on a complete systems approach to attain CO2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 28: The Mobility Pyramid.

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities but does not have local land use planning authority.

Caltrans also assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the U.S. EPA and ARB.

Caltrans is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 10 summarizes the Departmental and statewide efforts that Caltrans is implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Table 10. Climate Change/CO_2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings Million Metric Tons (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	.975	7.8
Operational Improvements & Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.07	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	.0045	.0065 .045 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	4.2 3.6
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Caltrans policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)[9] provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures will also be included in the Alameda Creek Bridge Replacement Project to reduce the GHG emissions and potential climate change impacts from the project:

1. According to Caltrans' Standard Specifications, the contractor must comply with all of the Bay Area Air Management District rules, ordinances, and regulations regarding air quality restrictions

2. Compliance with Title 13, California Code of Regulations – Adopted by the Air Resources Board on June 15, 2008, this regulation would restrict idling of construction vehicles to no longer than 5 consecutive minutes. The contractor must comply with this regulation in order to reduce harmful emissions from diesel-powered construction vehicles.

3. To the extent that it is feasible for the project, the use of reclaimed water may be used to reduce GHG emissions produced during construction. Currently 30 percent of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, which reduces greenhouse gas emissions from electricity production.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy

[9] http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

(OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[10], outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08 which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state, and federal public and private entities to develop. The California Climate Adaptation Strategy (Dec 2009)[11], which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report[12] to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

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[10] http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation

[11] http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF

[12] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data

All projects that have filed a Notice of Preparation (NOP) as of the date of the EO S-13-08, and/or are programmed for construction funding through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The proposed Alameda Creek Bridge Replacement Project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

No-Build Alternative
The No-Build Alternative would not impact existing greenhouse gas emissions.

2.2.6.3 Avoidance, Minimization, and/or Mitigation Measures

CLIMATE CHANGE-1. According to Caltrans' Standard Specifications, the contractor must comply with all of the Bay Area Air Management District rules, ordinances, and regulations regarding air quality restrictions

CLIMATE CHANGE-2. Compliance with Title 13, California Code of Regulations – Adopted by the Air Resources Board on June 15, 2008, this regulation would restrict idling of construction vehicles to no longer than 5 consecutive minutes. The contractor must comply with this regulation in order to reduce harmful emissions from diesel-powered construction vehicles.

CLIMATE CHANGE-3. To the extent that it is feasible for the project, the use of reclaimed water may be used to reduce GHG emissions produced during construction. Currently 30 percent of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, which reduces greenhouse gas emissions from electricity production.

2.2.7 Energy

2.2.7.1 Regulatory Setting

The CEQA Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

2.2.7.2 Affected Environment

The affected environment is a two-lane, undivided, rural highway, located on SR-84 from postmile 13.0 to postmile 13.6.

2.2.7.3 Environmental Consequences

All Build Alternatives
The proposed Alameda Creek Bridge Replacement Project will not result in an increase in long-term energy consumption from existing baseline conditions. Indirect energy use during the construction of the facility will increase as result of construction activities; however, this impact will be temporary and will not result in significant energy consumption. The Alameda Creek Bridge Replacement Project will have a less-than-significant impact on energy.

No-Build Alternative
The No-Build Alternative would not impact existing energy use levels.

2.2.7.4 Avoidance, Minimization, and/or Mitigation Measures
No avoidance, minimization, and/or mitigation measures are recommended.

2.3 Biological Environment
2.3.1 Natural Communities
This section of the document discusses natural communities of concern. The focus of this section is on natural communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act and fish passage issues associated with California Central Coast Distinct Population Segment (DPS) Steelhead, are discussed below in the Section 2.3.5 Threatened and Endangered Species. Wetlands and other waters are discussed in Section 2.3.2.

2.3.1.1 Regulatory Setting
The following analysis is based on the Natural Environment Study prepared for the Alameda Creek Bridge Replacement Project (Caltrans, 2014k). The affected environment is discussed in the context of seven natural community types that exist within the project area. These include California annual grasslands, oak woodlands, riparian woodland, coastal scrub, riverine, wetlands, and urban. A description of each community is provided below.

California Annual Grassland

California annual grasslands are an upland vegetation community composed of a dense-to-sparse cover of mainly introduced annual grasses, usually less than three feet in height. They sometimes include remnants of native perennial grasses, and often include a diverse assemblage of native annual forbs (wildflowers). California annual grasslands (approximately three acres total) are found throughout the western portions of the studied project limits on mesic soils (soils that retain adequate moisture year round), adjacent to roadside or in patches between coast live oak woodland and disturbed sites along SR-84. Common annual grass species in these patches include various brome species (*Bromus spp.)*, wild oats (*Avena fatua*), foxtail barley (*Hordeum marinum ssp. gussoneanum*), yellow star thistle (*Centaurea solstitialis*), poison hemlock (*Conium maculatum*), and other non-native herbs.

Many wildlife species use grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and escape cover. Characteristic reptiles that breed in annual grassland habitats include the western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus oregonus*). Mammals typically found in this habitat include the black-tailed jackrabbit, California ground squirrel (*Otospermophilus beechyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), American badger (*Taxidea taxus*), and coyote (*Canis latrans*). Birds commonly known to breed in annual grasslands include short-eared owl (*Asio flammeus*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*). This habitat also provides important foraging habitat for the turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus)*, American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and prairie falcon (*Falco mexicanus*) (Mayer and Laudenslayer 1988). Special-status species that may occur in grassland habitats include California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), western burrowing owl (*Athene cunicularia hypugaea)*, pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), and San Joaquin kit fox (*Vulpes macrotis mutica*).

Coastal Oak Woodlands

Coastal oak woodland (approximately three acres total) is a common vegetation community within the project study limits, and occurs on the north- and west-facing slopes above Alameda Creek. The dominant hardwood species are California bay laurel (*Umbellularia californica*) and coast live oak (*Quercus agrifolia*). Common tree associates in this habitat include madrone (*Arbutus menziesii*), California buckeye (*Aesculus californica*), and big leaf maple (*Acer macrophyllum*). Poison oak (*Toxicodendron diversilobum*) and snowberry (*Symphoricarpos spp*.) are common understory associates. Although this vegetation community contains native species, it is still a disturbed community due to the proximity of SR-84.

The dense understory and thick layer of leaf litter found within this woodland type provide habitat for many common species of amphibian, reptile, and small mammal. At

least 60 species of mammals may use oaks in some way, and as many as 110 species of birds have been observed during the breeding season in California habitats where oaks form a significant part of the canopy or subcanopy. Quail, turkeys, squirrels, and deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in significant declines in their populations (Mayer and Laudenslayer 1988). Special-status species that may occur in oak woodland habitats include California red-legged frog, foothill yellow-legged frog (*Rana boylii*), California tiger salamander, Alameda whipsnake, pallid bat, western mastiff bat, and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*).

Valley Foothill Riparian

The valley foothill riparian community (approximately eight acres total) within the project study limits is characterized by mature riparian forest with 40 to 80 percent canopy cover, often dominated by winter deciduous trees (trees that shed leaves annually during the winter months). The majority of the community occurs along the edges of Alameda Creek and northern boundary of the project study limits. Dominant over-story species include western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), big leaf maple, and coast live oak. Sub-canopy species include arroyo willow (*Salix lasiolepis)*, red willow (*Salix laevigata*), and blue elderberry (*Sambucus mexicana*). Understory species include poison oak, Himalayan blackberry (*Rubus discolor*), and wild grape (*Vitis californica*).

Riparian habitats provide food, water, migration and dispersal corridors, escape, nesting, and thermal cover for an abundance of wildlife. At least 50 amphibians and reptiles occur in lowland riparian systems. Bats also use riparian woodlands as foraging and roosting habitat. This habitat supports many permanent residents, but also provides habitat for transient or temporal visitors. In one study conducted on the Sacramento River, 147 bird species were recorded as nesters or winter visitors. Additionally, 55 species of mammals are known to use California's Central Valley riparian communities (Mayer and Laudenslayer 1988). Special-status species that may occur in riparian woodlands include California red-legged frog, California tiger salamander, foothill yellow-legged frog, yellow warbler (*Dendroica petechial brewsteri*), pallid bat, western mastiff bat, and San Francisco dusky-footed woodrat.

Although the vegetation and aquatic communities were classified using *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988), certain areas within the valley foothill riparian community include California sycamore woodlands (Saywer et. al. 2009), a specialized alliance which is recognized with S3 Ranking by the State of California Natural Communities List (CDFW 2010). An S3 ranking is defined by CDFW as "vulnerable in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation from the State (CDFW 2014b).” California sycamore woodlands occur in gullies, intermittent streams, springs, seeps, stream banks, and terraces adjacent to floodplains that are subject to high-intensity flooding. As a result of this inundation, few understory plants typically grow within this sub-habitat.

Coastal Scrub

Coastal scrub (approximately one-acre total) is the dominant vegetation community on the south-facing hills within the project study limits. Two types of coastal scrub are present within the project study limits:

- Coyote brush (*Baccharis pilularis*) scrub;
- California sagebrush (*Artemisia californica*) scrub.

Coyote brush scrub, common in more recently disturbed sites, is found in the ecotones between coastal oak woodland and California annual grasslands. Associate species include non-native grasses and small forbs. California sagebrush scrub is found on rocky, steep slopes. Patches of the California sagebrush scrub community are found on the southwestern boundary of the project study limits, above SR-84. Common species in this area include sticky monkey flower (*Diplaucus [= Mimulus] aurantiacus*), soap plant (*Chlorogalum pomeridianum*), poison oak, and elegant clarkia (*Clarkia unguiculata*). Within the costal scrub community on the southern portion of the project study limits is a small clump of Tasmanian blue gum eucalyptus (*Eucalyptus globulus*) near the southern project boundary, where approximately five individual trees are situated adjacent to SR-84.

Numerous bird, mammal, and reptile species utilize scrub habitats. Wildlife found in scrub habitat includes species such as white-crowned sparrow (*Zonotrichia leucophrys*), western fence lizard, whipsnakes (*Masticophis spp.*), gopher snake (*Pituophis catenifer*), and deer mouse (*Peromyscus maniculatus*). Special-status species that may occur in scrub include Alameda whipsnake, pallid bat, and western mastiff bat.

Riverine

The riverine community (approximately three acres total) is typically characterized by intermittent or continually running water. The riverine community within the project study limits is characterized as the active floodplain of Alameda Creek, including the cobble and boulder margins and islands within Alameda Creek. Riverine habitat contains vegetation such as torrent sedge (*Carex nudata*) shadowed by over-story trees, including white alder (*Alnus rhombifolia*), black walnut, Fremont cottonwood, and western sycamore. Tules (*Schoenoplectus spp.*), rushes (*Juncus spp.*), and a variety of strictly hydrophytic vegetation may also occur within this habitat.

Open water areas within large creeks or rivers provide resting and escape cover for many species of waterfowl. In addition, osprey (*Pandion haliaetus*), bald eagles (*Haliaeetus leucocephalus*), herons, various shorebirds, and belted kingfisher (*Megaceryle alcyon*) may forage over open water, or along the banks of creeks and rivers. Many species of insectivorous birds (i.e., swallows, swifts, flycatchers) catch their prey on the wing while over open water. Common mammals found in riverine habitats include river otter (Lontra canadensis), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), and beaver (*Castor canadensis*). Special-status species that may occur in riverine habitats include California red-legged frog, foothill yellow-legged frog, river lamprey (*Lampetra ayresii*), Pacific lamprey (*Entosphenus tridentatus*), steelhead (*Oncorhynchus mykiss irideus*), Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), western

pond turtle (*Emys marmorata*), tricolored blackbird (*Agelaius tricolor*), yellow warbler, pallid bat, and western mastiff bat.

Fresh Emergent Wetland

The fresh emergent wetland vegetation community (approximately 0.6 acre total) is typically characterized by colonial hydrophytic vegetation in areas that are perennially wet, or inundated to the point of creating anaerobic soils. The fresh emergent wetlands within the project study limits are restricted to areas where the riparian and riverine habitats converge. This category is synonymous with the 'palustrine emergent wetland' and 'riverine emergent wetland' defined in the jurisdictional delineation for this project (USACE 2010). A 'palustrine emergent wetland' includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 %. A 'riverine emergent wetland' includes all wetlands and deepwater habitats contained within a channel except those defined as palustrine wetlands. Dominant species within the fresh emergent wetland are typically monocots such as tule, chairmaker's bulrush (*Schoenoplectus americanus*), and bur reed (*Sparganium eurycarpum ssp. eurycarpum).*

Common wildlife that could occur in freshwater marsh habitat include wading birds such as great blue heron (*Ardea herodias*) and green heron (*Butorides virescens*), as well as passerines such as sparrows and towhees. Freshwater marsh can provide breeding habitat for many amphibian species, including Pacific chorus frog (*Pseudacris regilla*) and western toad (*Bufo boreas*). Reptiles, such as aquatic garter snake (*Thamnophis atratus*) and western pond turtle, spend the majority of their life cycles in and around freshwater marsh habitats. Special-status species that may occur in fresh emergent habitats include California red-legged frog, foothill yellow-legged frog, California tiger salamander, western pond turtle, tricolored blackbird, yellow warbler, pallid bat, and western mastiff bat.

Urban / Barren

The term urban/barren (approximately three acres total) is used to describe the existing SR-84 roadway and shoulders, as well as the slope paving between PM 13.5 and 13.65. For purposes of this study, only the vegetation and aquatic communities that occur under the existing Alameda Creek Bridge – rather than the paved surface area of the bridge itself – were considered when discussing the urban impacts. Therefore, the area of vegetation under the existing paved bridge deck was counted in the total for the vegetation communities, and not in the urban/barren classification.

Urban habitats are capable of supporting a number of bird species associated with urban environments, and which are known to be tolerant of disturbance by human activities, such as wrentits (*Chamaea fasciata*), bushtits (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), chestnut-backed chickadee (*Poecile rufescens*), and California quail (*Callipepla californica*). Common mammals found in this environment are black-tailed deer (*Odocoileus hemonius*) and black-tailed jackrabbit (*Lepus californicus*). Gopher snake and western fence lizard also occur in this zone (Mayer and Laudenslayer

1988). Due to the disturbed nature of this habitat, it is not generally considered suitable for special-status species.

2.3.1.2 Environmental Consequences

All Build Alternatives

Each of the Build Alternatives would result in some measure of impact on natural communities within the project limits. The type and extent of permanent and temporary impacts vary depending upon Build Alternative and habitat (Table 11).

Table 11. Land Cover Acreages affected by the Alameda Creek Bridge Replacement

Alternative 1 Impacts

Land Cover Type	Permanent Impact	Temporary Impact	Total Impact
Annual Grassland	0.4	0.5	**0.9**
Barren	0.1	0.2	**0.3**
Coastal Oak Woodland	0.7	0.8	**1.5**
Coastal Scrub	0.6	0.3	**0.9**
Fresh emergent wetland	0.002	0.3	**0.3**
Riverine	0	0.2	**0.2**
Urban	0.2	0.4	**0.6**
Valley Foothill Riparian	0.8	1.8	**2.6**
Total:	**2.8**	**4.5**	**7.3**

Alternative 2 Impacts

Land Cover Type	Permanent Impact	Temporary Impact	Total Impact
Annual Grassland	0.5	0.4	0.9
Barren	0.1	0.2	0.3
Coastal Oak Woodland	0.5	0.9	1.4
Coastal Scrub	0.3	0.4	0.7
Fresh emergent wetland	0.0	0.3	0.3
Riverine	0.0	0.3	0.3
Urban	0.2	0.4	0.6
Valley Foothill Riparian	0.7	1.7	2.4
Total:	**2.3**	**4.6**	**6.9**

Alternative 3A Impacts

Land Cover Type	Permanent Impact	Temporary Impact	Total Impact
Annual Grassland	0.5	0.4	0.9
Barren	0.1	0.2	0.3
Coastal Oak Woodland	0.7	0.8	1.5
Coastal Scrub	0.4	0.4	0.8
Fresh emergent wetland	0.0	0.3	0.3
Riverine	0.0	0.3	0.3
Urban	0.3	0.5	0.8
Valley Foothill Riparian	0.8	2.0	2.8
Total:	**2.9**	**4.9**	**7.8**

Alternative 3B Impacts

Land Cover Type	Permanent Impact	Temporary Impact	Total Impact
Annual Grassland	0.4	0.5	0.9
Barren	0.1	0.2	0.3
Coastal Oak Woodland	0.6	0.6	1.2
Coastal Scrub	0.4	0.4	0.8
Fresh emergent wetland	0.0	0.3	0.3
Riverine	0.0	0.3	0.3
Urban	0.3	0.5	0.8
Valley Foothill Riparian	0.3	1.6	1.9
Total:	**2.1**	**4.4**	**6.5**

While the proposed project may result in the permanent loss of wetlands and other waters and various habitat types, including live coast oak woodlands, the Alameda Creek Bridge Replacement Project would improve the hydrologic regime of the Alameda Creek channel. Benefits include the removal of existing Alameda Creek Bridge footings and removal of invasive giant reed populations. These actions will improve riparian habitat by restoring the Alameda Creek to a more natural morphology and facilitating the development of linear in-stream wetlands along the channel banks.

A total of 1,135 trees were recorded within the project area and the majority of trees (1,051) are considered native to California. This number of trees represents the total

number of trees within the project area and not the number of trees that will be impacted by the proposed project. The number of trees located within temporary or permanent impact areas differs depending on the Build Alternative and are present in Tables 12 and 13. Trees located in permanent impact areas are likely to be removed during project activities. Some trees located in temporary impact areas may be preserved pending on the specific activity occurring near them. To be conservative, Caltrans is accounting for removal of all trees in temporary impact areas. During construction Caltrans will make an effort to reduce impact to trees in temporary impact areas to the greatest extent possible.

Table 12. Impacts to Trees for Build Alternatives 1 and 2.

Species	Alternative 1 Permanent Impacts	Alternative 1 Temporary Impacts	Alternative 1 Total Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts	Alternative 2 Total Impacts
Arroyo willow	0	11	**11**	6	5	**11**
Big-leaf maple	8	13	**21**	6	12	**18**
Black acacia	1	3	**4**	1	3	**4**
Blue elderberry	1	4	**5**	2	2	**4**
Box elder	0	1	**1**	0	1	**1**
California bay tree	43	56	**99**	25	36	**61**
California buckeye	6	3	**9**	0	2	**2**
Coast live oak	56	64	**120**	48	52	**100**
Eucalyptus species	8	4	**12**	12	0	**12**
Fremont cottonwood	0	12	**12**	3	9	**12**
Italian alder	0	1	**1**	0	1	**1**
N. CA black walnut	1	2	**3**	0	1	**1**
Ngaio	0	1	**1**	0	0	**0**
Plum species	1	1	**2**	0	1	**1**
Red willow	2	26	**28**	6	21	**27**
Western sycamore	25	38	**63**	11	35	**46**
White alder	0	23	**23**	4	19	**23**
Total	**152**	**263**	**415**	**124**	**200**	**324**

Table 13. Impacts to Trees for Build Alternatives 3A and 3B

Species	Alternative 3A Permanent Impacts	Alternative 3A Temporary Impacts	Alternative 3A Total Impacts	Alternative 3B Permanent Impacts	Alternative 3B Temporary Impacts	Alternative 3B Total Impacts
Arroyo willow	4	7	**11**	0	5	**5**
Big-leaf maple	7	12	**19**	4	11	**15**
Black acacia	2	2	**4**	3	1	**4**
Blue elderberry	3	1	**4**	0	1	**1**
Box elder	0	1	**1**	0	1	**1**
California bay tree	37	32	**69**	22	20	**42**
California buckeye	7	1	**8**	7	1	**8**
Coast live oak	59	48	**107**	50	49	**99**
Eucalyptus species	12	0	**12**	6	0	**6**
Fremont cottonwood	1	11	**12**	0	9	**9**
Italian alder	0	1	**1**	0	1	**1**
N. CA black walnut	0	2	**2**	0	2	**2**
Plum species	0	1	**1**	0	1	**1**
Red willow	5	22	**27**	0	21	**21**
Western sycamore	16	36	**52**	16	35	**51**
White alder	1	22	**23**	0	18	**18**
Total	**154**	**199**	**353**	**108**	**176**	**284**

The removal of trees as result of the Alameda Creek Bridge Replacement Project could have a potentially significant impact to natural communities. To mitigate for this potentially significant impact, measures were developed to provide replacement for trees within the project area, to the maximum extent possible. Caltrans will provide tree replacement on-site for upland trees at a 1:1 ratio in the existing SR-84 alignment after the construction of the Alameda Creek Bridge Replacement Project. However, there may not be sufficient space to replant all trees at this location. Depending on the Build Alternative selected and the number of upland trees able to be planted on-site, there may be a need for off-site mitigation planting (at a location to be determined). Mitigation for trees removed from the riparian zone will be mitigated at a 3:1 ratio and will be replanted within the Alameda Creek watershed, with as many riparian mitigation trees planted on-site as possible. Depending on the Build Alternative selected and the number of riparian trees able to be planted on-site, there may be a need for off-site mitigation planting. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements. Mitigation Measure TREES-1

will be implemented to reduce impacts to natural communities by ensuring trees are replanted on-site and within the Alameda Creek watershed to the maximum extent possible. Although the project will result in temporary disturbances and loss of natural communities, the project will restore habitat loss through on-site replanting activities and the enhancement of riparian habitat. The old SR-84 alignment will be remediated and replanted with appropriate native vegetation and trees to account for community habitat impacts that may result from the Alameda Creek Bridge Replacement Project.

The Alameda Creek Bridge Replacement Project could have a potentially significant impact to natural communities. However, after mitigation, the Alameda Creek Bridge Replacement Project will have a less-than-significant impact to natural communities.

No-Build Alternative
The No-Build Alternative would not impact natural communities within the project limits.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Caltrans will implement the general measures described in Section 2.3.7 (Project Design Avoidance and Minimization Measures) as part of the Alameda Creek Bridge Replacement Project to avoid and minimize effects to natural communities. Specific measures to account for tree loss are provided below:

TREES-1. Caltrans will provide tree replacement on-site at a minimum 1:1 ratio in the existing SR-84 alignment for upland trees. Depending on the Build Alternative selected and the number of upland trees able to be planted on-site, there may be a need for off-site mitigation planting (at a location to be determined). Mitigation for trees removed from the riparian zone will be mitigated at a 3:1 ratio and will be replanted within the Alameda Creek watershed, with as many riparian mitigation trees planted on-site as possible. Depending on the Build Alternative selected and the number of riparian trees able to be planted on-site, there may be a need for off-site mitigation planting. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements.

2.3.2 Wetlands

2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the CWA (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and 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 allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. 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 which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the SWRCB, the RWQCB and the CDFW. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code (FGC) require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. 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 exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Section 2.2.2 Water Quality contains further details about the CWA Section 401 permit request.

2.3.2.2 Affected Environment

A preliminary investigation of jurisdictional waters for approximately 11.1 acres around the Alameda Creek Bridge was completed in 2009 (Caltrans, 2014k). This investigation was subsequently verified and revised by the Caltrans Liaison at the USACE in 2010 (Caltrans, 2014k). This revised investigation noted 0.4 acre of jurisdictional wetlands and 2.1 acres of other waters of the U.S. within the previous project study limits. An additional field investigation on June 11, 2014 delineated potential waters of the U.S., including wetlands and water features in new areas of the project limits (approximately 9.8 acres). This investigation served as an amendment to the field verifications completed in 2010. The field delineation was conducted during the early summer (June 2014). The winter of 2013-2014 was among the top three driest water years on record in California, and 2013 was the all-time driest calendar year. However, the identification of wetlands is based on hydric soil characteristics, direct hydrologic indicators, and vegetation types. This combination of criteria allowed investigators to determine presence of wetlands under the low-precipitation conditions.

The field delineation identified approximately 3.8 acres of potential-jurisdictional water features within the 9.8 acres of new areas of the current project area, including approximately 0.2 acre of wetlands and 3.6 acres of other waters. Based on criteria as described in 33 CFR 328.3, all of the mapped potential waters of the U.S. within the new areas of the project area are considered jurisdictional. The jurisdiction of individual features, as discussed in this report, should be verified by the USACE. Combined with the previous delineation, there are a total 6.2 acres of potentially jurisdictional wetlands or other water features in the project area.

Table 14. Wetlands and Other Waters in the Project Study Limits

Feature Type	Feature Name	Area (acres)	Area (ft^2)
USACE (2010)			
Wetlands	N/A	0.4	15,682
Other Waters of U.S.	N/A	2.1	89,734
GANDA (2014)			
Wetlands			
Fresh emergent wetland	FE-1	0.03	1,525
Fresh emergent wetland	FE-2	0.03	1,481
Fresh emergent wetland	FE-3	0.1	2,787
Fresh emergent wetland	FE-4	0.04	1,568
Fresh emergent wetland	FE-5	0.03	1,481
Fresh emergent wetland	FE-6	0.03	1,481
Other Waters of the U.S.			
Perennial creek	PC-1	3.4	148,583
Perennial creek	PC-2	0.2	7,100
Wetland Total		**0.6**	**26,005**
Other Waters of the U.S. Total		**5.6**	**245,417**
Total		**6.2**	**271,422**

2.3.2.3 Environmental Consequences

All Build Alternatives

Within the project study limits, there are 6.2 acres of potentially jurisdictional wetland or water features. Of this acreage, all Build Alternatives would result in some level of temporary and permanent impacts.

Table 15. Impacts to Wetlands and Other Waters

Type	Temporary Impacts (Acres)				Permanent Impacts (Acres)				Total Impacts (Acres)			
Alternative	1	2	3A	3B	1	2	3A	3B	1	2	3A	3B
Wetland	0.3	0.3	0.3	0.3	0.002	0.0	0.0	0.001	0.3	0.3	0.3	0.3
Other Waters	0.9	1.0	1.0	0.8	0.0	0.2	0.1	0.001	0.9	1.2	1.1	0.8
Total	**1.2**	**1.3**	**1.3**	**1.1**	**0.002**	**0.2**	**0.1**	**0.002**	**1.2**	**1.5**	**1.4**	**1.1**

All Build Alternatives will result in minor permanent loss of wetlands and other waters. Build Alternative 2 will result in the largest amount of permanent impacts to other waters while Alternatives 1 and 3B are the alternatives with the least amount of impacts to wetlands and other waters. Although all Build Alternatives result in some permanent

wetland or other waters loss, overall net long-term impacts on wetland and water features associated with the Alameda Creek Bridge Replacement Project are positive. On-site restoration efforts, included as part of the project, propose the removal of the existing Alameda Creek Bridge (including in-stream columns) and removal of the invasive giant reed populations within the project area. Additionally, all temporarily impacted wetlands and other waters would be restored and revegetated when the project is complete. The project's minimal permanent impacts to wetlands and other waters, combined with on-site restoration efforts will reduce the Alameda Creek Bridge Replacement Project's impacts to a less than significant level to wetlands and other waters.

In addition to the on-site restoration efforts included as part of the project, all Build Alternatives propose to remove the existing footings and concrete wall of an older bridge, located upstream of the existing Alameda Creek Bridge. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. The removal of the concrete weir will beneficially impact Alameda Creek by allowing the stream to take on a more natural morphology, in addition to facilitating the development of linear in-stream wetlands along the banks, further reducing project impacts to wetlands and other waters. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal Endangered Species Act (ESA) consultation and the following permits: California Department of Fish and Wildlife (CDFW) 1602 Streambed Alteration Agreement and Clean Water Act (CWA) Section 404 and 401 permits. The removal of the weir is not considered mitigation for any level of CEQA significance, but is applied in the analysis in this document as a minimization measure where appropriate.

While the Alameda Creek Bridge Replacement Project will temporarily impact wetlands and other waters within the project limits, the project ultimately improve the long-term health of wetland and other water features in this section of Alameda Creek. The Alameda Creek Bridge Replacement Project would result in a less-than-significant impact to wetlands and other waters.

No-Build Alternative

The No-Build Alternative would result in no wetland or other waters loss. The No-Build Alternative would not remove the concrete weir and the invasive giant weed populations in the project vicinity would not be removed from the channel. Alameda Creek would not be restored to a more natural morphology.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans will implement the general measures described in Section 2.3.7 (Project Design Avoidance and Minimization Measures) as part of the Alameda Creek Bridge Replacement Project to avoid and minimize effects to wetlands and other waters. Specific measures to account for wetlands and other waters loss are provided below:

WETLANDS-1. Compensatory mitigation under the CWA at a minimum one-to-one ratio is required for all permanent wetland impacts. Proposed compensation for wetland impacts include removal of the concrete weir upstream of the existing bridge, removal of

current in-stream bridge columns for the existing bridge, removal of invasive giant reed populations within the project area, and restoring and re-vegetating all temporarily impacted wetlands.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see Section 2.3.5 Threatened and Endangered Species in this document for detailed information about these species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California FGC, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at FGC, Section 1900-1913, and CEQA, CA PRC, Sections 2100-21177.

2.3.3.2 Affected Environment

The following analysis is based on the Natural Environment Study prepared for the Alameda Creek Bridge Replacement Project (Caltrans, 2014k). Based on literature and database searches, prior botanical surveys, and familiarity with the region, a total of 38 plant species were initially evaluated, and 25 species were determined to have the potential to occur within the project study limits. Rare plant species occurrences within 5 miles of the project study limits include Congdon's tarplant (*Centromadia parryi ssp. congdonii*), Santa Clara red ribbons (*Clarkia concinna ssp. automixa*), most beautiful jewelflower (*Streptanthuus albidus ssp. peramoenus*), slender-leaved pondweed (*Stuckenia filiformis ssp. alpine*), and chaparral harebell (*Campanula exigua*). In 2009, URS Corporation completed a rare plant survey for a previous iteration of the project, which documented no rare plants (Caltrans, 2014k). For the proposed project, a rare plant survey was conducted within the project study limits in May and July 2014, and no special-status plants were observed.

2.3.3.3 Environmental Consequences

All Build Alternatives

The completion of both the 2009 and May and July 2014 plant surveys indicate there is a low potential for rare plant occurrences in the project study limits. Due to a delay in obtaining access permits, there are potential limitations with the spring 2014 surveys

since they were conducted late in the blooming period. Avoidance and minimization measures will be implemented to ensure additional surveys occur prior to project construction. In the event that protected species are discovered, appropriate agency coordination and protective measures will be established.

No-Build Alternative

The No-Build Alternative would not change existing conditions and would not result in impacts to plant species. The No-Build Alternative would not involve the removal of invasive giant reed populations within the project limits.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans will implement the general measures described in Section 2.3.7 (Project Design Avoidance and Minimization Measures) as part of the Alameda Creek Bridge Replacement Project to avoid and minimize effects to plant species. Specific measures to avoid and minimize impacts to plant species are provided below:

PLANT-1. Additional seasonally-timed special-status plant surveys will occur prior to project construction. If protected species are discovered, appropriate agency coordination and protective measures will be established.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, NMFS, and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state ESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5 below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act
- State laws and regulations relevant to wildlife include the following:
- California Environmental Quality Act
- Sections 1600 – 1603 of the California FGC
- Sections 4150 and 4152 of the California FGC

2.3.4.2 Affected Environment

The following analysis is based on the Natural Environment Study prepared for the Alameda Creek Bridge Replacement Project (Caltrans, 2014k). Wildlife studies were completed in the project study limits in spring and summer 2014, including a reconnaissance bat survey, wildlife assessment, and bat roosting habitat survey. Based on literature and database searches, past wildlife studies, and familiarity with the region, a total of 63 wildlife species were initially considered to potentially occur within the

project area. Following the wildlife studies, 42 of these species were dropped from consideration based on lack of suitable habitat. Three federal and/or state-listed species (discussed in Section 2.3.5), and six California species of special concern were considered to have at least a moderate potential to occur in the project area.

California Species of Special Concern with Moderate/High Potential to Occur

- River lamprey (*Lampetra ayresii*)
- Western pond turtle (*Emys marmorata*)
- Yellow warbler (*Dendroica petechial brewsteri*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*)

Other Special-Status Animals with Moderate/High Potential to Occur

- Pacific lamprey (*Entosphenus tridentatus),* CDFW special animal
- Hoary bat (*Lasiurus cinereus*), CDFW special animal
- Long-eared myotis (*Myotis evotis*), CDFW special animal
- Fringed myotis (*Myotis thysanodes*), CDFW special animal
- Yuma myotis (*Myotis yumanensis*), CDFW special animal
- Migratory birds, Migratory Bird Treaty Act and California FGC

River lamprey (California species of special concern) and Pacific Lamprey (CDFW special animal)

The river lamprey is a California species of special concern, and the Pacific lamprey is on CDFW's special animals list. Both of these species are anadromous fish. Adults are predatory, attaching to and feeding on other fish (most commonly herring and salmon) while inhabiting marine coastal and estuarine waters (Caltrans, 2014k). Spawning takes place in gravelly riffles during the spring, with adults dying after spawning. Ammocetes (lamprey larvae) partially bury themselves in silty backwaters and eddies to feed on algae and microorganisms (Leidy 2007). Although they are generally anadromous, river lampreys and Pacific lampreys are thought to be capable of completing their life cycle in fresh water in cases where they are landlocked (Caltrans, 2014k).

Currently, fish passage between Alameda Creek and San Francisco Bay is blocked within the City of Fremont by a concrete grade control structure operated by the ACWD. This structure, located approximately 3.75 miles downstream from the Alameda Creek Bridge, is commonly referred to as "the BART weir" because of its proximity to the BART system tracks. The most recent confirmed observation of a river lamprey in Alameda Creek occurred in 1966. However, anadromous Pacific lampreys have been recently documented upstream of the project area within the Alameda Creek watershed, which indicates that Pacific lampreys are capable of traversing the BART weir (Caltrans, 2014k). Pacific and river lamprey are difficult to differentiate using morphological clues, and therefore it is possible that some of the sightings of Pacific lamprey in Alameda Creek may have been river lamprey. A lamprey of indeterminate species was observed during the fish habitat assessment conducted in 2011 for this project (Caltrans, 2014k). Since river lamprey may be capable of traversing the BART weir structure in the same

manner as the Pacific lamprey, and suitable spawning and rearing habitat exists within Alameda Creek, both species are considered to have a moderate potential to occur within the project area. The planned restoration of fish passage at the BART weir, as discussed in Section 2.4.4.8, would allow these species greater access to Alameda Creek.

Western pond turtle (California species of special concern)

The western pond turtle is a California species of special concern. Western pond turtles range throughout California, from southern coastal California and the Central Valley, north to the Cascade and eastern Sierra Nevada mountain ranges. Western pond turtles occur in a variety of permanent and intermittent aquatic habitats, such as ponds, marshes, rivers, streams, and ephemeral pools. They require slack or slow water habitat for feeding as well as suitable dry habitat such as rocks or fallen logs for basking and hauling out. In addition to appropriate aquatic habitat, these turtles require an upland nesting site in the vicinity of the aquatic habitat, often within 200 meters (656 feet). Nests are typically dug in grassy, open fields with soils that are high in clay or silt. Egg-laying usually takes place between March and August (Caltrans, 2014k).

There are six occurrences of western pond turtle within five miles of the project area (Caltrans, 2014k). The nearest of these was recorded approximately 1.5 miles east of the project area, in a reach of Alameda Creek upstream from the Alameda Creek Bridge. This record includes two occurrences in the exact same area; one was a museum specimen collected in 1961, and the other was an adult male found near Alameda Creek in 2006. There is another occurrence recorded in 2007 approximately 2.3 miles southwest of the project area near the point where SR 237 crosses over Alameda Creek in Fremont. Within the project area, foraging and basking habitat is present in slower-moving reaches of Alameda Creek, though faster moving and heavily shaded reaches are not suitable for this species. Suitable nesting habitat is also present in the project area in south-facing areas where grasslands with hard-packed soils are adjacent to Alameda Creek. Therefore, the western pond turtle is considered to have a moderate potential to occur within the project area. No individuals were observed within the project area and no nesting behavior was observed during field surveys.

San Francisco dusky-footed woodrat (California species of special concern)

The San Francisco dusky-footed woodrat is a California species of special concern and is locally common in undisturbed portions of habitat throughout its range. This subspecies occurs only in the southern half of the Bay Area (south of Golden Gate through the Santa Cruz Mountains to the Pajaro River and in the East Bay, south of the Suisun Bay along the western slope of the Diablo Range). As a unique subspecies, this designation was confirmed by genetic studies based on mitochondrial DNA (Caltrans, 2014k), although the range may extend slightly farther south along the inner coast range. Woodrats feed mostly on woody plants such as coast live oak, other oaks, big-leaf maple, coffeeberry (*Rhamnus crocea*), alder (*Alnus* spp.), elderberry (*Sambucus* spp.), toyon (*Heteromeles arbutifolia*), and poison oak (Johnston and Cezniak 2004). Woodrats are active mainly at night, when they venture out to collect food (Caltrans, 2014k).

A nocturnal lifestyle allows them to avoid high daytime temperatures and predators. They build large stick nests referred to as "houses" that are typically made of twigs and leaves at the base of a tree, within a set of large logs or tree branches, or in a shrub such as poison oak or toyon. Some houses are constructed off the ground in the lower branches of large trees, typically live or blue oak (*Quercus douglasii*). Houses are usually built under the canopy of trees and the abundance of houses may be limited by the availability of house-building materials (Caltrans, 2014k). Dusky-footed woodrats live in loosely-cooperative societies and have a matrilineal (mother-offspring associations; through the maternal line) social structure (Caltrans, 2014k). Females generally remain close to their birth den, while males disperse away from their birth den and are highly territorial and aggressive, especially during the breeding season. Woodrats have a maximum dispersal range of one mile (Caltrans, 2014k). The breeding season of dusky-footed woodrats can extend from February through November (Caltrans, 2014k).

Active woodrat houses are well distributed throughout the project area. Location data for woodrat houses was collected during a tree survey conducted by Garcia and Associates (GANDA) in May and June 2014. A total of 21 houses were located within the project area. These houses were constructed primarily at the base of large trees. In addition, there is a California Natural Diversity Database (CNDDB) occurrence approximately two miles east of the project area, where many houses and individuals were recorded along Alameda Creek in 2006 (Caltrans, 2014k). Based on the presence of numerous woodrat houses, this species is considered to have a high potential to occur within the project area.

Roosting Bats

Bats are widespread within California, and may be found in any habitat. They are nocturnal aerial predators of insects and other arthropods, and often forage over open water, marshes, and other moist, open areas where flying insects tend to congregate. Different bat species have different roosting requirements and roosts can be found in a variety of habitats and locations. Day roosts, used from sunrise to sunset, provide a protected and sheltered location for bats to rest and sleep within a short flight to foraging areas and a site to raise their young (Caltrans, 2014k). Day roosts are an important habitat feature, which are believed to be limited in the landscape, and heavily influence the local geographic distribution of bats (Caltrans, 2014k). During the day, bats may use three types of roosts: crevices, cavities, and foliage. Crevice and cavity roosts may be found in natural and human-made features such as caves, cliffs, rock outcrops, trees, mines, buildings, bridges, and tunnels. During the breeding season (April through September), crevice and cavity roosting species typically gather in groups of mothers and young (maternity colonies) that may number in the thousands or even tens of thousands of individuals. In contrast, foliage-roosting bats may be solitary or occur in small groups while breeding. Roosts used during the day and as maternity roosts tend to be well-hidden and require precise temperature and humidity conditions that favor the growth of the young.

Night roosts, which are used from approximately sunset to sunrise, are primarily sites where animals congregate to rest and digest their food between foraging bouts (Caltrans, 2014k). Bats often use separate roosts at night as temporary resting locations in between

foraging bouts. Night roosts are often located in more open but protected areas such as overhangs on buildings and recessed areas on the undersides of bridges where warm air is trapped, and the concrete and steel thermo-regulate and retain heat better. Eight special-status bat species have potential to occur within the project area based on range, habitat, and recorded occurrences in the region. CNDDB occurrences are reported in the individual species descriptions below. Bats in general may be under-reported to the CNDDB relative to their actual abundance in the environment because they are nocturnal, difficult to detect, and difficult to positively identify and count when detected.

Pallid Bat (California species of special concern)

The pallid bat is a California species of special concern. It is a medium-sized bat that occurs throughout much of the state. They may occur in a wide variety of grasslands, shrublands, and woodlands, though they are generally found in dry, open areas at lower elevations. They typically fly low while foraging for prey, which are caught on the ground or gleaned off of foliage. Prey species include beetles, orthopterans, homopterans, moths, spiders, scorpions, and solpugids (Caltrans, 2014k). The species is capable of taking heavy-bodied insects such as June beetles and Jerusalem crickets as well (Caltrans, 2014k). Pallid bats make day roosts within crevices and cavities in caves, rocky outcrops, crevasses, mines, tree hollows, bridges, and buildings. Night roosts are typically in more open areas such as under porches and open buildings. Pallid bats are particularly sensitive to disturbance from humans at roost sites (Caltrans, 2014k). There is one occurrence of pallid bat recorded within five miles of the project area. It was recorded in 2001, but this occurrence is considered sensitive, and its specific locality is suppressed by the CNDDB. It is located somewhere within the La Costa Valley quad, which includes the San Antonio Reservoir and Sunol Regional Park areas (Caltrans, 2014k).

At least 13 pallid bats were observed using the Alameda Creek Bridge for night roosting during the bat roosting habitat survey in July 2014, and the riparian corridor within the project area is suitable foraging habitat for this species. Suitable roosting habitat may also occur in trees within the project area. Based on their confirmed presence in the project area and the presence of suitable foraging habitat, pallid bats are considered to have a high potential to occur within the project area.

Townsend's Big-eared Bat (California species of special concern)

Townsend's big-eared bat is a California species of special concern and is also a candidate for listing as Threatened or Endangered under CESA. The candidacy was announced by the California Fish and Game Commission on November 13, 2013, and CDFW will determine whether or not listing is warranted within one year of that announcement (Caltrans, 2014k). Townsend's big-eared bat is found throughout California except at high elevations. This species is dependent on cave-like roosting habitat and prefers to forage in native vegetation. Maternity colonies have been found in caves, mines, and buildings (Caltrans, 2014k), and they will hibernate during the winter in roosts which are cold, but not below freezing. This species feeds primarily on small moths, though beetles and other insects may be taken as well. They capture prey both in flight and by gleaning insects from foliage. This species is highly sensitive to disturbance at roost sites (Caltrans, 2014k). There is one occurrence of Townsend's big-eared bat

within five miles of the project area. This occurrence was recorded in 1943 approximately 3.5 miles south of the project area, in the vicinity of Mission San Jose (Caltrans, 2014k).

Both of the abutments of the Alameda Creek Bridge contain semi-enclosed spaces with low ceilings that could be used by Townsend's big-eared bats for roosting. However, there is significant evidence of human activity in this space, including graffiti and trash, which greatly reduces the probability that this space would be used for roosting due to the species' sensitivity to disturbance. For this reason, roosting habitat on the bridge is marginal for Townsend's big-eared bat. However, trees within the project area may have suitable habitat for this species, and suitable foraging habitat is present throughout the project area and the rest of Niles Canyon. Based on the presence of suitable roosting and foraging habitat, Townsend's big-eared bat is considered to have a moderate potential to occur within the project area. This species was not detected during the bat roosting habitat survey in July 2014.

Western Red Bat (California species of special concern)

The western red bat is a California species of special concern. It is widely distributed throughout California and known to occur in a variety of habitats, including forested canyons, riparian zones and arid areas where they primarily roost in trees and sometimes shrubs (Caltrans, 2014k). This non-colonial species roosts in foliage, under overhanging leaves. Western red bats are commonly associated with cottonwood/sycamore and willow riparian habitats (Pierson et al. 2006; Pierson and Rainey 2002). There are no recorded occurrences of western red bat in the CNDDB within five miles of the project area (Caltrans, 2014k).

Western red bats may forage throughout the project area, and they may roost in trees within any of the vegetated habitats. Because this species roosts in foliage, they are not expected to roost on the bridge itself. Based on the presence of suitable foraging and tree roosting habitat, western red bats are considered to have a moderate potential to occur within the project area. This species was not detected during the bat roosting habitat survey in July 2014.

Hoary Bat (CDFW special animal list)

The hoary bat is included on CDFW's special animals list. It is a widespread species found in a variety of habitats throughout California. This solitary bat is most commonly found in association with forested habitats near water (Caltrans, 2014k). Roosting sites are generally in dense foliage of both coniferous and deciduous trees, at the ends of branches 10-40 feet above the ground, and with open flying space below (Caltrans, 2014k). Moths are the primary food source for hoary bats (Caltrans, 2014k). Females give birth to young in mid-May through early July. There are no recorded occurrences of hoary bat in the CNDDB within five miles of the project area (Caltrans, 2014k).

Hoary bats may forage throughout the project area, and they may roost in trees within any of the vegetated habitats. Because this species roosts exclusively in foliage, they are not expected to roost on the bridge itself. Based on the presence of suitable foraging and

roosting habitat, hoary bats are considered to have a moderate potential to occur within the project area. This species was not detected during the bat roosting habitat survey in July 2014.

Long-eared Myotis (CDFW special animal list)

The long-eared myotis is included on CDFW special animal list. It can be found throughout California except in the Central Valley and southern deserts. They may occur in all brush, woodland, and forest habitats, though coniferous woodlands and forests seem to be preferred. Roosts are made in buildings, crevices, under tree bark, and in snags. This species roosts singly or in small groups, with nursery colonies ranging from 12-30 individuals. Long-eared myotis prey on a variety of insects and other small arthropods, which are captured in the air, gleaned from foliage, or occasionally taken from the ground (Caltrans, 2014k). There are no recorded occurrences of long-eared myotis in the CNDDB within five miles of the project area (Caltrans, 2014k).

Long-eared myotis may roost in crevices within the Alameda Creek Bridge, or in tree crevices or cavities throughout the project area. This species may also forage throughout the project area. Two acoustic detections that are attributed to either long-eared myotis or fringed myotis were recorded within the project area during the July 2014 survey. Based on the presence of suitable roosting and foraging habitat, and the possible acoustic detection of this species, long-eared myotis is considered to have a moderate potential to occur within the project area.

Fringed Myotis (CDFW special animals list)

The fringed myotis is included on CDFW special animal list. It occurs throughout California except for the Central Valley and southern deserts. They may occur in a wide variety of habitats, although pinyon-juniper, valley foothill hardwood, and hardwood-conifer habitats are apparently preferred. Caves, mines, buildings, and crevices are all used for roosting, and maternity colonies can contain up to 200 individuals. Fringed myotis feed mostly on beetles, but other insects and arthropods are also taken. They feed over water, over open areas, and by gleaning from foliage (Caltrans, 2014k). There are no recorded occurrences of fringed myotis in the CNDDB within five miles of the project area (Caltrans, 2014k).

Fringed myotis may roost in crevices within the Alameda Creek Bridge, or in tree crevices or cavities throughout the project area. This species may also forage throughout the project area. Two acoustic detections that are attributed to either long-eared myotis or fringed myotis were recorded within the project area during the July 2014 survey. Based on the presence of suitable roosting and foraging habitat, and the possible acoustic detection of this species, fringed myotis is considered to have a moderate potential to occur within the project area.

Yuma Myotis (CDFW's Special Animals List)

The Yuma myotis is included on CDFW special animal list. It is a common species occurring throughout California except in the arid Mojave and Colorado Desert regions. They feed on a variety of small insects, and generally forage over water sources such as rivers, lakes, ponds, and stock tanks, most often in open woodland or forest areas. Roosting habitat includes crevices in caves, large trees, mines, buildings, tunnels, and bridges. During the April through September breeding season the females gather into maternity colonies that number in the hundreds to thousands of individuals. Night roosts may be located in more open areas (Caltrans, 2014k). There is one occurrence of Yuma myotis recorded within five miles of the project area. It was recorded in 2006 approximately 1.2 miles southeast of the project area, in a drainage in the hills just south of Niles Canyon (Caltrans, 2014k).

Three Yuma myotis maternity colony roost locations were found in expansion joints of the Alameda Creek Bridge during the bat roosting habitat survey in July 2014. Yuma myotis may also roost in trees within the project area. Suitable foraging habitat is present throughout the project area, especially where the creek pools and the water is slow-moving. Based on their confirmed presence in 2014, the Yuma myotis is considered to have a high potential to occur during the construction period.

Migratory Birds

Under the federal Migratory Bird Treaty Act (MBTA) and California FGC Sections 3503-3505, 3513, and 3800, migratory birds, their nests, and eggs are protected from disturbance or destruction. Removal or disturbance of active nests would be in violation of these regulations. All birds are protected under the MBTA and California FGC except for two non-native species, the European starling (*Sturnus vulgaris*) and the house sparrow (*Passer domesticus*).

Migratory bird species may nest in any of the habitat types within the project area except for paved road surfaces and riverine aquatic areas. Riparian woodlands are particularly attractive for nesting birds. Numerous species could also nest within oak woodlands, coastal scrub, and grassland areas. Even barren areas may be used by ground-nesting birds such as killdeer for nesting.

During the wildlife habitat assessment, several mud nests constructed by cliff swallows (*Petrochelidon pyrrhonota*) were observed on the northeast side of the Alameda Creek Bridge. Cliff swallows were observed flying into and out of some of these nests, indicating that they were active and likely contained eggs or chicks at the time of the survey. Cliff swallows nest colonially, and return to the same nesting areas year after year. Other common bird species that may nest on the bridge include but are not limited to black phoebe (*Sayornis nigricans*), northern rough-winged swallow (*Stelgidopteryx serripennis*), and house finch (*Carpodacus mexicanus*), all of which nest variously on ledges, in crevices, or on sheltered vertical surfaces.

In addition to common bird species, several special-status birds have at least some potential to nest and/or forage within the project area, including those listed below:

- Cooper's hawk (*Accipiter cooperii*), CDFW special animal
- White-tailed kite, CDFW fully protected
- Yellow warbler, California species of special concern
- Heron and Egret Rookeries, CDFW special animals
  - Great blue heron
  - Great egret (*Ardea alba*)
  - Snowy egret (*Egretta thula*)
  - Black-crowned night heron (*Nycticorax nycticorax*)

There are three CNDDB occurrences of nesting Cooper's hawks recorded within five miles of the project area. All three were recorded in 2006 in the hills just south of Niles Canyon, and the closest occurrence is approximately 0.5 mile south of the project area (Caltrans, 2014k). Cooper's hawks may nest in any of the tall trees in the oak woodland and riparian habitats within the project area, and may forage throughout the area. Based on the presence of suitable nesting and foraging habitat, Cooper's hawks are considered to have a moderate potential to occur within the project area.

There are no CNDDB records of white-tailed kite nesting within five miles of the project area (Caltrans, 2014k). However, white-tailed kites are a common nesting and winter resident bird in the Bay Area. White-tailed kites may nest in trees throughout the project area. Although grasslands are present within the project area, they are of marginal quality for foraging due to their small size. White-tailed kites typically forage in more open areas, so the relatively small patches of open grassland within the project area are of marginal quality for foraging. Based on the presence of suitable nesting habitat and marginally suitable foraging habitat, white-tailed kites have a moderate potential to occur within the project area.

There are no occurrences of yellow warbler recorded in the CNDDB within five miles of the project area (Caltrans, 2014k). However, riparian woodland along Alameda Creek constitutes suitable nesting habitat for this species, and they may forage in trees and shrubs anywhere within the project area. Based on the presence of suitable nesting and foraging habitat, yellow warbler is considered to have a moderate potential to occur within the project area.

There are two occurrences of great blue heron rookeries within five miles of the project area recorded in the CNDDB. The first is located approximately two miles east of the project area near the east end of Niles Canyon, where two active nests were observed along Alameda Creek in 2002. The other is a record of nine nests observed in 1990 in the Quarry Lakes Regional Recreation Area in Fremont, approximately 3.2 miles southwest of the project area (Caltrans, 2014k). Another great blue heron rookery with an unknown number of nests has been documented near the Sunol Water Temple, three miles east of the project area (Caltrans, 2014k), and a large rookery used by over a hundred nesting pairs of black-crowned night herons, great egrets, and snowy egrets is located at Lake Elizabeth, approximately 3.5 miles to the south (Caltrans, 2014k).

Suitable nesting habitat for herons and egrets is present in tall trees throughout the project area and the rest of Niles Canyon. Suitable foraging habitat is present along the banks of

Alameda Creek, and great blue herons, snowy egrets, and black-crowned night herons were all observed in or near the creek during field surveys conducted for this project. No heron or egret rookeries were observed during the wildlife habitat assessment, and there are no indications that any colonies have traditionally nested in this part of Niles Canyon. However, based on these species' ubiquity in the region and the presence of suitable nesting and foraging habitat, heron and egret rookeries are considered to have a moderate potential to occur within the project area.

2.3.4.3 Environmental Consequences

All Build Alternatives

River Lamprey and Pacific Lamprey

Direct impacts to lamprey may result from construction work within riverine or wetland portions of the project area. Indirect impacts may result from habitat exclusion, and construction activities may include water quality degradation from erosion or sediment loading. The water quality impacts are unlikely, given the proposed avoidance and minimization measures and implementation of Caltrans water quality BMPs (Caltrans 2010b). Implementing the project will result in the removal of existing bridge footings from the creek channel and the removal of invasive giant reed populations. This will beneficially impact Alameda Creek by allowing the stream to take on a more natural morphology and facilitating the development of linear in-stream wetlands along the banks. Impacts to river lamprey and pacific lamprey are less than significant. Furthermore, implementing the project will also result in the removal of the upstream concrete weir which will further reduce impacts to river lamprey and pacific lamprey.

Western Pond Turtle

Direct impacts to western pond turtle may result from relocation efforts and earth-moving activities in potential habitat. Indirect impacts may result from habitat exclusion, water quality degradation from erosion or sediment loading due to construction activities, and removal of potential basking habitat with the removal of the concrete weir. The water quality impacts are unlikely, given the proposed avoidance and minimization measures and implementation of Caltrans water quality BMPs (Caltrans, 2010b). The removal of potential basking habitat is minimal due to a substantial amount of alternative basking habitat available in the surrounding area. Implementing the project will result in the removal of existing bridge footings from the creek channel and removal of invasive giant reed populations. This will benefit Alameda Creek by allowing the stream to take on a more natural morphology and facilitating the development of linear in-stream wetlands along the banks. Impacts to western pond turtle are less than significant.

San Francisco Dusky Woodrat

Riparian and oak woodland habitats within the project area provide habitat for woodrats. Nests located in permanent impact areas will have to be removed and/or relocated. If any nests are located in the zone of temporary impact, they may not need to be removed depending on the type of project activities that will occur, but construction could disturb the woodrats enough to cause nest abandonment. The numbers of houses that are located within the temporary and permanent impact areas are summarized in Table 16.

Table 16. Permanent and Temporary Impacts to San Francisco Dusky-Footed Woodrat Houses.

Alternative	Permanent Impact (# of Houses)	Temporary Impact (# of Houses)	Total Impact (# of Houses)
1	6	6	**12**
2	6	5	**11**
3A	7	4	**11**
3B	5	3	**8**

Although the proposed project would result in the removal and/or relocation of several San Francisco dusky-footed woodrat houses, there will a negligible impact on the local woodrat population. Project design of the impact area will avoid sensitive habitat areas and woodrat nests to the maximum extent practicable. Impacts to San Francisco dusky-footed woodrat are less than significant. To further reduce impacts to woodrats, Caltrans' proposes to request a Memorandum of Understanding (MOU) with CDFW to develop and implement a relocation plan for the woodrat houses affected by the Alameda Creek Bridge Replacement project.

Roosting Bats

Project related construction work within riparian woodland habitats is likely to have temporary and permanent impacts on roosting bats. Ground disturbing activities and the operation of equipment near known roost sites under the current Alameda Creek Bridge have the potential to harass individual bats. Harassment of these individuals may result in the temporary avoidance of roost sites during project activities, including the *Yuma myotis* maternity roost. Removal of the existing Alameda Creek Bridge will permanently remove a known day and night roost site for several species of bats, including the *Yuma myotis* maternity roost. In addition to demolishing the bridge, implementing the project will result in the removal of existing bridge footings from the creek channel, removal of the upstream concrete weir and removal of invasive giant reed populations. This will benefit Alameda Creek and bat foraging habitat by allowing the stream to take on a more natural morphology and facilitating the development of linear in-stream wetlands along the banks.

Permanently removing a known day and night roost site for several species of bats, including the *Yuma myotis* maternity roost, could be a potentially significant impact to roosting bats. Measures were developed to provide on-site habitat for bats in the new bridge structure by the construction of new daytime crevice roosts and recessed night roosts out of concrete into the underside of the new bridge structure. Implementation of these mitigation measures will lessen the loss of day and night roosting habitat from the demolition of the existing bridge. Impacts to roosting bats would be less than significant with the implementation of mitigation measures that provide new bat habitat within the project limits. There is a possibility that bat populations roosting on the existing Alameda Creek Bridge may choose not to roost on the new Alameda Creek Bridge, however, Caltrans has had previous success with bats utilizing roosting structures installed on new bridges (Caltrans, 2004b). To increase the chances of the roosts being utilized, the

roosting structures that will be installed on the new Alameda Creek Bridge will be similar to the current roosts available to bats on the existing bridge and similar to the roost structures that have proven successful on other Caltrans bridges. Impacts to roosting bats are less than significant with mitigation.

Migratory Birds

The proposed project could result in temporary loss or disturbance of habitats that are used by nesting migratory birds. During project-related construction, common migratory birds may be temporarily displaced by habitat alteration or noise from construction equipment. However, implementation of the proposed avoidance and minimization measures is anticipated to prevent direct mortality of migratory birds. The proposed project may potentially remove or disturb a small amount of unoccupied habitat used by nesting or foraging migratory birds. This impact would be temporary in nature and limited to a relatively small area in relationship to the extensive nesting and foraging habitat adjacent to the project area. Because the new bridge will be constructed first, the loss of nesting habitat for cliff swallows on the current bridge would be minimized through the creation of potential new nesting substrate on the new Alameda Creek Bridge. As a result, impacts to migratory birds are less than significant.

No-Build Alternative

The No-Build Alternative would have no impact to special status and locally rare species as the existing bridge would remain in place and no habitat would be affected.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Caltrans will implement the general measures described in Section 2.3.7 (Project Design Avoidance and Minimization Measures) as part of the Alameda Creek Bridge Replacement Project to avoid and minimize effects to animal species. Specific measures to avoid and minimize impacts to animal species are provided below:

WOODRAT-1. Caltrans will request a MOU with CDFW to develop and implement a relocation plan for woodrat houses that will be affected by the proposed project.

BATS-1. To mitigate for the loss of day and night roosting habitat from the removal of the existing bridge, Caltrans will incorporate constructed daytime crevice roosts and recessed night roosts out of concrete into the underside of the new bridge structure.

BATS-2. A roosting bat exclusion plan will be implemented during the non-breeding season.

BATS-3. No more than two weeks prior to tree removal, a qualified biologist will conduct a pre-construction survey for crevice and cavity roosting habitat in trees within the project area that are 12 inches or greater in diameter at breast height. If active roosting habitat is identified, minimization measures will be identified through coordination with CDFW.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 CFR Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the FHWA, are required to consult with the USFWS and the NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a No Effect finding. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, CESA, California FGC Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2081 of the FGC prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the FGC as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by the CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the FGC.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

2.3.5.2 Affected Environment

A Natural Environment Study (NES) was completed for the Alameda Creek Bridge Replacement Project (Caltrans, 2014k). Three federally threatened and endangered species, the California red-legged frog, the Alameda whipsnake, and steelhead – California Central Coast DPS are located within the project limits are discussed in further detail below.

California Red-legged Frog

The California red-legged frog (CRLF) was federally listed as a threatened species on May 23, 1996 (Caltrans, 2014k). Revised critical habitat for this species was designated by USFWS on March 17, 2010 (Caltrans, 2014k). It is also a California species of special concern.

The project study limits are within the historic and current range of CRLF (Caltrans, 2014k). The proposed project is also within the boundary of the South and East San Francisco Bay Recovery Unit, based on the core area maps provided in the California Red-legged Frog Recovery Plan (Caltrans, 2014k). The proposed project is located outside of CRLF critical habitat. A review of the CNDDB (Caltrans, 2014k) indicated that a total of nine CNDDB occurrences of CRLF have been reported within a five-mile radius of the project study limits, the closest of which is approximately one mile from the project. These occurrences are shown on Figure 7. Occurrences within two miles of the project study limits, which is the maximum dispersal distance of CRLF recognized by the USFWS (Caltrans, 2014k), include:

- CNDDB occurrences 568 and 569 (2000) – One juvenile was collected in a stock pond in grazed grassland at Vargas Ranch, approximately 1 mile south of the project area (occurrence 569), and one larvae was collected in a stock pond also on Vargas Ranch, approximately 1.5 miles southeast of the project area (occurrence 568), both in May 2000.
- CNDDB occurrence 581 (2000) – Two larvae were observed and collected in a stock pond in grazed grassland, 1.3 miles north-northeast of the intersection of Morrison Canyon Road and Vargas Road, approximately 1 mile southeast of the project area, in June 2000.

No protocol-level surveys for CRLF were conducted within the project study limits, and no CRLFs were observed during the technical field studies related to the development of this document. There is potential aquatic and dispersal CRLF habitat within the project area. The fresh emergent wetland, riverine, and valley foothill riparian communities provide suitable aquatic and riparian habitat for the species. The fresh emergent wetland and valley foothill riparian communities likely provide the dense riparian vegetation that CRLF use for cover. The riverine habitat throughout the project area, which has an average depth of two to four feet in summer months, also contains overhanging vegetation and islands of fresh emergent wetlands within the middle of the active channel which contribute to the suitability of the habitat as aquatic habitat for CRLF.

The riverine habitat of Alameda Creek and associated fresh emergent wetlands within the project area do not provide suitable breeding habitat for CRLF. During the CRLF breeding season (November through April) Alameda Creek can experience flood events with high velocity flows that prevent successful breeding. Areas affected by such flows include the slow moving pools and wetland margins within the project area. Alameda Creek is known to support predatory, non-native fish that prey on CRLF tadpoles or eggs.

Because the project area does not contain suitable breeding habitat it is unlikely to support a high density of CRLF. However, CRLF may be present in low numbers during periods of movement, particularly when using upland communities adjacent to these

aquatic habitats, including California annual grassland, coastal oak woodland, and coastal scrub. The Alameda Creek corridor and its tributaries likely provide dispersal and refuge habitat for CRLF.

Given the proximity of recent CNDDB records to the project area connected by the relatively undisturbed riparian corridor of Alameda Creek, and the suitable aquatic and dispersal habitat within the project area, the species has the potential to occur within the project area. As a result, Caltrans has inferred that CRLF are present, and may use the project area as dispersal and foraging habitat.

Alameda Whipsnake

The Alameda whipsnake (AWS) is listed as threatened under both the FESA and CESA. It was federally listed in 1997 (Caltrans, 2014k), and state listed in 1971. The range of this species is primarily restricted to the inner Coast Range in western and central Contra Costa and Alameda Counties, though there are also records in San Joaquin and Santa Clara Counties (Caltrans, 2014k). AWS are 30 to 60 inches long, with dark brown or black on the back and wide orange stripes down the sides. The underside is also orange, becoming pink toward the tail (Caltrans, 2014k).

There are 31 recorded occurrences of AWS within the nine-quad CNDDB search area around the project area. Due to the sensitivity of the species, the specific localities of AWS occurrences are suppressed in CNDDB, and only the quad in which each occurrence is located is mapped. During trapping surveys for the Caltrans Tyler Ranch Project, 12 individual AWS were captured and released between May 8 and May 29, 2012. This trapping was conducted approximately two miles east of the project area. Caltrans reported these AWS occurrences to the CNDDB, but this data has not yet been entered into the public database. Critical habitat was designated for AWS in 2006 (Caltrans, 2014k), and 3.55 acres of critical habitat (Critical Habitat Unit 3 – Hayward Pleasanton Ridge) occur within the project area. The total area of Recovery Unit 3 is approximately 25,965 acres.

When designating critical habitat, USFWS is required to list the known primary constituent elements (PCE), which are habitat components essential to the conservation of the species and which may require special management considerations and protection (50 CFR §424.12). The PCEs for the AWS include the following:

> PCE 1 – Scrub/shrub communities with a mosaic of open and closed canopy
> PCE 2 – Woodland and annual grassland plant communities contiguous to lands containing PCE 1
> PCE 3 – Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and or PCE 2

All areas finalized as critical habitat for the AWS are considered occupied, within the subspecies' historic geographic range, and contain sufficient PCEs to support at least one life history function, as defined in by the published final rule designating critical habitat on October 2, 2006 (71 CFR 58191).

No protocol-level surveys for AWS were conducted in the project area, and no AWS were observed during the technical field studies related to the development of this document. The wildlife habitat assessment determined that suitable AWS habitat exists within the project area. The upland communities, including coastal scrub, coastal oak woodland, valley foothill riparian, and California annual grassland, provide suitable dispersal, foraging, and limited breeding habitat for the species. All of these communities likely provide suitable refuge areas, including limited small mammal burrows and rock outcrops, which the AWS may use during overland movements from March through November. The communities also likely support a western fence lizard population that could serve as a prey base for the AWS. Although the species is unlikely to use the riverine and fresh emergent wetland communities for reproduction or foraging, the Alameda Creek has been noted as a movement corridor connecting populations on either side of the Ala-680 freeway (Caltrans, 2014k). AWS may access Alameda Creek and travel along the east-west stream corridor of Alameda Creek from areas immediately outside of the project area.

Given the proximity of CNDDB records, the suitable habitat within the project area, and the project occurring within Critical Habitat Unit 3, Caltrans has inferred presence of AWS. Caltrans suspects that AWS largely are using the project area for dispersal and foraging. There is a very low potential for areas within the project area to be used as breeding habitat.

Steelhead – Central California Coast Distinct Population Segment (DPS)

The Central California Coast Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss irideus*) is a federally listed threatened species. Their range is defined by the NMFS as all naturally spawned populations from the Russian River south to Aptos Creek in Santa Cruz County, including drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers. Steelhead employs a variety of life history strategies that take advantage of the diversity of river systems and regional conditions to which they are adapted.

Currently, fish passage between Alameda Creek and San Francisco Bay is blocked within the City of Fremont by a concrete grade control structure operated by the ACWD. This structure, located approximately 3.75 miles downstream from the Alameda Creek Bridge, is commonly referred to as “the BART weir” because of its proximity to the BART system tracks. *Oncorhynchus mykiss* are known to occur within the Alameda Creek watershed (Caltrans, 2014k). Because these fish are prevented from leaving the watershed by the BART weir, they are not currently considered to be anadromous Central California Coast DPS steelhead and do not receive protection under the FESA. Instead, they are considered to be landlocked rainbow trout. ACWD is scheduled to install a fish ladder that will circumvent this structure in 2016 (Alameda County Water District, 2014). If that occurs, fish passage between San Francisco Bay and the Alameda Creek watershed would be restored, and *O. mykiss* within Alameda Creek will be included by NMFS as part of the federally threatened Central California Coast steelhead DPS.

Downstream of the project area, Alameda Creek has been extensively modified for flood control and groundwater recharge. Upstream of the project area, the creek has been modified by quarry activity and reservoir construction (Caltrans, 2014k). The SFPUC also regulates flow in Alameda Creek for flood protection and water management, which typically moderates flows during rain events (Caltrans, 2014k). These actions may influence the suitability of habitat for various life stages of steelhead.

In a genetic study conducted by Nielsen in 2002, rainbow trout within Alameda Creek were found to be most closely related to naturally-occurring steelhead spawning in Lagunitas Creek, Marin County, which is part of the federally threatened Central California Coast steelhead DPS. Rainbow trout in Arroyo Mocho, a stream which runs through urbanized areas of the Livermore Valley in the northern part of the Alameda Creek watershed, were found to be genetically distinct from other trout in the watershed. These fish are more closely related to stock from the Mount Whitney Hatchery in Inyo County, though it is unknown if this genetic association is due to historic undocumented stocking activities in Arroyo Mocho, or if the fish in Arroyo Mocho are a natural resident population from which the Mount Whitney Hatchery stock was originally derived (Caltrans, 2014k). Both the Alameda Creek population and the Arroyo Mocho population would move through the project area to access San Francisco Bay and further oceanic waters in the event that passage is restored at the BART weir.

A fish habitat assessment conducted by URS in 2011 (Caltrans, 2014k) found that no suitable steelhead spawning habitat was present within the project area downstream of the concrete weir, and that spawning habitat upstream was marginal due to the presence of fine sediments that could inhibit the necessary flow of oxygenated water to eggs. Rearing habitat for juveniles is present throughout the riverine habitat in the project area, provided that summer water temperatures remain relatively low.

This assessment also concluded that the potential for steelhead to occur in the project area was largely affected by downstream barriers. As mentioned earlier, the BART weir functions as a complete barrier to fish passage. In addition, several other structures downstream of the project area act as a barrier during moderate to low flow conditions. The middle and upper inflatable dams (located between the BART weir and where Alameda Creek crosses Mission Blvd.) are 13 feet high when inflated, and act as fish barriers during these periods (Caltrans, 2014k). Similar to the BART weir, other public agencies are planning the installation of fish ladders at both locations to allow for fish passage, and connect steelhead in Alameda Creek to San Francisco Bay. A USGS gauging station, located approximately one mile upstream of the Mission Blvd. crossing, can act as a potential barrier during moderate to low flow conditions in Alameda Creek (Caltrans, 2014k). The concrete weir located just upstream on the project area is likely to be a partial passage barrier to fish in Alameda Creek, particularly in low-flow conditions. At low-flow conditions, the weir's height above water prevents juvenile fish from physically moving upstream. As flows increase and water levels rise, fish are able to pass the barrier. The removal of these bridge footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following

permits: CDFW 1602 Streambed Alteration Agreement and CWA Section 404 and 401 permits.

2.3.5.3 Environmental Consequences

California Red-legged Frog

All Build Alternatives

The Niles Canyon corridor runs through a large tract of relatively undisturbed habitat within Alameda County. The hillsides surrounding this corridor include stock ponds, seasonal depression, and tributaries to Alameda Creek that support populations of CRLF. There are known CNDDB occurrences within the surrounding hillsides and CRLF are known to use localities within two miles of suitable breeding habitat. Given the proximity of the CNDDB occurrences and the presence of vegetated habitat, the project area has the potential to be used by CRLF. The species may also disperse through ruderal and barren areas, although it is less likely due to the lack of cover and suitable habitat.

As a result, direct effects to habitat for CRLF could occur. Habitat effects to CRLF are summarized in Table 17. Table 11 demonstrates the project impacts by land cover type. The barren road shoulder areas within the project area were not included in this calculation because these areas do not provide habitat for the species. Additionally, the barren road shoulder areas will remain barren, or will be revegetated maintaining the current dispersal characteristics for the species. Caltrans does not anticipate any effects to breeding habitat as there is no suitable CRLF breeding habitat within the project area. The work will be conducted during the dry season, when adult CRLF are not expected to be dispersing through the project area.

Direct effects to individual CRLF may occur throughout the project area as a result of construction activities, including site preparation, use of heavy equipment, placement of new permanent structures and the placement of temporary and permanent fills within dispersal and foraging habitat. Activities during construction could result in injury or death to the species in the construction area during these activities. All efforts to minimize direct effects will be made with the implementation of avoidance and minimization measures. There is a low potential for direct mortality of individuals due to excavation and grading activities with heavy equipment, due to the cryptic nature of the species. Indirect impacts may result from habitat exclusion, and construction activities could include water quality degradation from erosion or sediment loading. The water quality impacts are unlikely, given the proposed avoidance and minimization measures and Caltrans BMPs.

Table 17. Summary of Impacts to California Red-legged frog Habitat by Alternative

Land Cover	Temporary Impacts (Acres)				Permanent Impacts (Acres)				Total Impacts (Acres)			
Alternative	1	2	3A	3B	1	2	3A	3B	1	2	3A	3B
Annual Grassland	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.9	0.9	0.9	0.8
Coastal Oak Woodland	0.8	0.9	0.8	0.6	0.7	0.5	0.7	0.6	1.6	1.3	1.6	1.2
Valley Foothill Riparian	1.8	1.7	2.0	1.6	0.8	0.7	0.8	0.3	2.6	2.4	2.8	1.9
Fresh Emergent Wetland	0.3	0.3	0.3	0.3	0.002	0.001	0.001	0.001	0.3	0.3	0.3	0.3
Coastal Scrub	0.3	0.4	0.4	0.4	0.6	0.3	0.4	0.4	0.9	0.7	0.8	0.7
Total	**3.7**	**3.7**	**3.9**	**3.4**	**2.5**	**2.0**	**2.4**	**1.7**	**6.3**	**5.6**	**6.4**	**4.9**

Work in Alameda Creek will be conducted during the dry season, when adult CRLF are not expected to be dispersing through the project area. Efforts to further minimize direct effects to individual CRLFs during construction activities will occur with the implementation of project avoidance and minimization measures. Long-term impacts on CRLF habitat are expected to be beneficial as the Alameda Creek Bridge Replacement Project would remove the existing bridge (including in-stream columns) and remove invasive giant reed populations within the project area. This will allow the stream to take on a more natural morphology and facilitate the development of linear in-stream wetlands along the banks. Caltrans does not anticipate the project will increase barriers to wildlife movement or cause increased roadside mortality. All Build Alternatives would impact CRLF habitat to varying degrees, but all Build Alternatives will have a less-than-significant impact to individual CRLFs during construction and to CRLF habitat in the project area.

To further reduce impacts to CRLF, Caltrans will provide compensation for impacts to CRLF through on-site restoration of temporarily impacted areas (at a 1:1 ratio), and of compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. Proposed compensatory mitigation by Build Alternative is shown in Table 18. A portion of this proposed compensation will be covered by the on-site restoration of the current bridge columns and roadway approaches. This compensation may be used to satisfy the conditions of multiple agencies and jurisdictions, including FESA and CESA. The final compensation may be subject to change during the consultation and permitting processes.

Additionally, CRLF habitat would benefit from the removal of the former bridge footings and concrete wall (weir) located upstream of the existing Alameda Creek Bridge. The removal of the weir will allow the stream to take on a more natural morphology and further facilitate the development of linear in-stream wetlands along the banks. The removal of the weir is proposed as part of the Alameda Creek Bridge Replacement

Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA 404 and 401 permits.

Table 18. Proposed Compensation for Impacts to California Red-legged frog

Design Alternative	Total
Alternative 1 Compensation	
1:1 Ratio for Temporary	3.7
3:1 Ratio for Permanent	7.6
Total Compensation	**11.3**
Alternative 2 Compensation	
1:1 Ratio for Temporary	3.7
3:1 Ratio for Permanent	5.7
Total Compensation	**9.4**
Alternative 3A Compensation	
1:1 Ratio for Temporary	3.9
3:1 Ratio for Permanent	7.4
Total Compensation	**11.3**
Alternative 3B Compensation	
1:1 Ratio for Temporary	3.3
3:1 Ratio for Permanent	5.0
Total Compensation	**8.3**

In conclusion, impacts to California red-legged frog as a result of the Alameda Creek Bridge Replacment Project would be less than significant.

No-Build Alternative
The No-Build Alternative would not impact California red-legged frog habitat.

Alameda Whipsnake
All Build Alternatives
The Niles Canyon corridor in the project vicinity intersects a large tract of relatively undisturbed habitat within Alameda County that contains suitable AWS habitat and is known to support AWS. Because AWS are a highly mobile species and use a wide variety of habitats adjacent to scrub habitat, all vegetated upland communities within the project area have the potential to be used by AWS. The species may disperse through the barren areas, although it is less likely due to the lack of cover and suitable habitat. Within the project area, temporary and permanent impacts to AWS habitat are anticipated. These impacts are summarized in Table 19. The barren road shoulder areas within the project area were not included in this calculation, because these areas do not provide habitat for the species.

Direct effects to individual AWS may occur throughout the project area as a result of construction activities, including site preparation, use of heavy equipment, placement of new permanent structures and the placement of temporary and permanent fills within dispersal and foraging habitat. Activities during construction could result in injury or death in the construction area. All efforts to minimize direct effects will be made with the implementation of avoidance and minimization measures. There is a low potential for direct mortality of individuals, due to excavation and grading activities with heavy equipment. Although this is not anticipated, it is possible due to the cryptic nature of the species. Indirect impacts may result from temporary habitat exclusion and degradation, during periods of construction activities. Degradation of habitat from the proposed project will be off-set through on-site restoration.

Table 19. Summary of Impacts to Alameda Whipsnake by Alternative.

Land Cover	**Temporary Impacts (Acres)**				**Permanent Impacts (Acres)**				**Total Impacts (Acres)**			
Alternative	1	2	3A	3B	1	2	3A	3B	1	2	3A	3B
Annual Grassland	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.9	0.9	0.9	0.8
Coastal Oak Woodland	0.9	0.9	0.8	0.6	0.7	0.5	0.7	0.6	1.6	1.3	1.6	1.2
Valley Foothill Riparian	1.8	1.7	2.0	1.6	0.8	0.7	0.8	0.3	2.6	2.4	2.8	1.9
Coastal Scrub	0.3	0.4	0.4	0.4	0.6	0.3	0.4	0.4	0.9	0.7	0.8	0.7
Total	**3.5**	**3.4**	**3.6**	**3.1**	**2.5**	**2.0**	**2.4**	**1.7**	**6.0**	**5.3**	**6.1**	**4.6**

Impacts to critical habitat must not adversely modify the critical habitat to the point that it can no longer aid in the species' recovery. Within the project area, temporary impacts and permanent impacts are anticipated to AWS critical habitat from the proposed project (Table 20). Under Build Alternative 1 (the alternative with the greatest impacts), the total project related impacts to critical habitat is approximately 2 acres, which is less than one hundredth of a percent of the total area (~26,000 acres) of Critical Habitat Unit 3. Caltrans also anticipates a net beneficial effect to Niles Canyon riparian habitat due to removal and enhancement of the old roadway alignment. Due to the nominal disturbance to critical habitat within the proposed project area and an overall beneficial improvement, Caltrans does not anticipate an adverse modification to critical habitat for AWS.

Table 20. Summary of Impacts to AWS Critical Habitat Unit 3.

Alternative	Temporary Impacts (Acres)	Permanent Impacts (Acres)	Total Impacts (Acres)
1	0.8	1.2	**2.0**
2	0.8	0.4	**1.2**
3A	0.8	0.6	**1.4**
3B	0.8	0.6	**1.4**

Impacts to AWS could be potentially significant given the proposed Alameda Creek Bridge Replacement Project may directly affect individual AWS in the project area as a result of construction activities. Activities during construction, including site preparation, use of heavy equipment, placement of new permanent structures and the placement of temporary and permanent fills within dispersal and foraging habitat, could result in injury or death in the construction area. Avoidance and minimization measures listed in Section 2.3.7 Project Design Avoidance and Minimization Measures will lessen project impacts to AWS. In addition to avoidance and minimization measures, Caltrans developed measures to mitigate for the degradation of AWS habitat. Caltrans proposes mitigation for AWS through on-site restoration of temporarily impacted areas (at a 1:1 ratio), and of compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. Proposed mitigation by Build Alternative is shown in Table 21. A portion of this proposed mitigation will be covered by the on-site restoration of the existing Alameda Creek Bridge columns and roadway approaches. In addition to serving as mitigation for CEQA, this mitigation may be used to satisfy the conditions of multiple agencies and jurisdictions including FESA and CESA. The final mitigation requirements under FESA and CESA will be established during the consultation and permitting processes. These estimates are subject to change.

Table 21. Proposed Mitigation for Impacts to Alameda Whipsnake

Design Alternative	Total
Alternative 1 Compensation	
1:1 Ratio for Temporary	3.4
3:1 Ratio for Permanent Impacts	7.6
Total Compensation	**11.0**
Alternative 2 Compensation	
1:1 Ratio for Temporary	3.4
3:1 Ratio for Permanent Impacts	5.7
Total Compensation	**9.1**
Alternative 3A Compensation	
1:1 Ratio for Temporary	3.6
3:1 Ratio for Permanent Impacts	7.4
Total Compensation	**11.0**
Alternative 3B Compensation	
1:1 Ratio for Temporary	3.0
3:1 Ratio for Permanent Impacts	5.0
Total Compensation	**8.0**

All Build Alternatives would impact AWS habitat and Critical Habitat Unit 3 to varying degrees but project avoidance and minimization measures, in conjunction with the proposed mitigation, will reduce effects of all Build Alternatives on AWS to a less than significant level. The Alameda Creek Bridge Replacement Project will have a less-than-significant impact with mitigation to AWS.

No-Build Alternative
The No-Build Alternative would not impact Alameda whipsnake habitat or any Alameda whipsnake Critical Habitat Unit 3.

Steelhead- Central Californa Coast Distinct Population Segment (DPS)
All Build Alternatives
Direct effects to protected *O. mykiss* are not anticipated from the proposed project. Indirect impacts may result from habitat exclusion, and construction activities could include water quality degradation from erosion or sediment loading. The water quality impacts are unlikely, given the proposed avoidance and minimization measures and Caltrans BMPs. In addition to the main creek channel, riparian vegetation adjacent to the creek improves steelhead habitat by providing cover, structure in the form of woody debris, bank stability, and input of food sources. Temporary impacts to habitat in the project area for protected *O. mykiss* may result from installation of water diversion structures, placement of falsework, new bridge construction, and removal of the original bridge structure within the dry working environment. Riparian vegetation adjacent to the main creek channel also will be affected by the proposed project. Streamside trees and other vegetation will be removed for access. Removal of this vegetation will occur for

geotechnical analysis, installation of the new bridge structure, new bridge approaches, and the creation of retaining and soil-nail walls. Table 22 summarizes project effects to steelhead habitat.

Permanent effects to the riverine habitat are anticipated through the installation of new bridge columns. The new pier footprint will be smaller than the existing pier walls in the stream channel; there should be a reduction of hard structure. There are potential shade changes that could occur within the project area at Alameda Creek due to vegetation removal and changes to the bridge deck. Efforts to further minimize direct effects to individual steelhead during construction activities will occur with the implementation of project avoidance and minimization measures. Overall, potential long-term impacts on steelhead habitat associated with the replacement of Alameda Creek Bridge are expected to be beneficial. Implementing the Alameda Creek Bridge Replacement Project will result in the removal of existing bridge footings from the creek channel and the removal of invasive giant reed populations. The reduction of hard structure in Alameda Creek will allow the stream to take on a more natural morphology and remove a low-flow passage barrier to steelhead.

Table 22. Permanent and Temporary Effects to Steelhead Habitat

Land Cover	**Temporary Impacts (Acres)**				**Permanent Impacts (Acres)**				**Total Impacts (Acres)**			
Alternative	1	2	3A	3B	1	2	3A	3B	1	2	3A	3B
Fresh emergent wetland	0.3	0.3	0.3	0.3	0.002	0.001	0.001	0.001	0.3	0.3	0.3	0.3
Riverine	0.2	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3
Valley Foothill Riparian	1.8	1.7	2.0	1.6	0.8	0.7	0.8	0.3	2.6	2.4	2.8	1.9
Total	**2.3**	**2.3**	**2.6**	**2.2**	**0.8**	**0.7**	**0.8**	**0.3**	**3.1**	**3.0**	**3.4**	**2.5**

Permanent effects to steelhead habitat as a result of the proposed project would be off-set through the restoration of areas currently occupied by the existing bridge piers and abutments and the proposed removal of the upstream concrete weir. As a result of the restoration and enhancement efforts the riparian corridor will be restored on-site under the existing bridge deck, in all temporarily impacted areas, and in areas where invasive giant reed populations are removed. Caltrans proposes restoration of these areas with riparian woodland and fresh emergent wetland vegetation to off-set permanent effects from construction of the new bridge. Overall, construction impacts to individual steelhead and long-term impacts to steelhead habitat as a result of the Alameda Creek Bridge Replacement Project would be less than significant.

In addition, Caltrans has proposed the removal of the concrete weir above the existing Alameda Creek Bridge. Removal or modification of the fish barrier during low-flow conditions would provide further connectivity to the creek system for juvenile steelhead. The removal of the weir is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation and the following permits: CDFW 1602 Streambed Alteration Agreement and CWA 404 and 401 permits. Continued coordination and consultation with NMFS will occur to finalize the compensatory mitigation for this species under FESA. As of result of these on-site improvements, steelhead habitat, regardless of Build Alternative selection, would improve.

No-Build Alternative

The No-Build Alternative would not change the existing conditions of the project vicinity. The weir would remain in the creek and continue to pose as a barrier to fish passage.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

The avoidance and minimization measures listed in Section 2.3.7 (Project Design Avoidance and Minimization Measures) will reduce the potential effects to threatened and endangered species during project construction. These measures include, but are not limited to, biological monitoring, worker environmental awareness training, pre-construction surveys, prevention of wildlife entrapment, wildlife exclusion fencing, and season work windows. Specific measures are listed below for each species of concern.

CRLF-1. Caltrans will provide compensation for impacts to CRLF through on-site restoration of temporarily impacted areas (at a 1:1 ratio), and of compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. A portion of this proposed compensation will be covered by the on-site restoration of the current bridge columns and roadway approaches.

AWS-1. Compensation for the minor disturbance to AWS Critical Habitat Unit 3 for AWS will occur through on-site restoration of temporarily impacted areas (at a 1:1 ratio), on-site restoration and enhancement of the existing SR-84 roadway and through compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. A portion of the proposed compensation for permanent impacts will be covered by the on-site restoration of the current bridge columns and roadway approaches.

STEELHEAD-1. Permanent effects to steelhead habitat as a result of the proposed project would be off-set through the restoration of ripairian, wetland, and riverine areas currently occupied by the existing Alameda Creek Bridge piers and abutments and the removal of invasive giant reed populations in the project area. Additionally, all Build Alternatives propose to remove the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. The removal of these bridge and concrete wall footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for

project impacts under the federal ESA consultation. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. Removal or modification of the concrete weir during low-flow conditions would provide further connectivity to the creek system for juvenile steelhead.

2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of NEPA analysis for a proposed project.

2.3.6.2 Affected Environment

A total of 1,135 trees were recorded within the project study limits of which 84 non-native trees were identified; these included scattered, individuals of nine non-invasive varieties (e.g. Juniper, Australian pine) as well as more invasive species such as tree of heaven (*Ailanthus altissima*). Additionally, invasive giant reed populations are located within the project study limits.

2.3.6.3 Environmental Consequences

Al Build Alternatives

The proposed project will remove invasive giant reed populations located within the project footprint and replace it with native vegetation. The old alignment will be remediated and replanted with appropriate native vegetation/trees. Specifications regarding vegetation and tree replacement will be provided during the design phase of the project (estimated to be completed in 2016). Caltrans Standard Specifications will control the spread or introduction of invasive species in the project vicinity (Caltrans, 2010b). No impact associated with invasive species is anticipated as a result of the project

No-Build Alternative

The No-Build Alternative would not change existing conditions and would not remove the invasive giant reeds located within the project footprint.

2.3.6.4 Avoidance, Minimization, and/or Mitigation Measures

INVASIVE-1. The project will remove invasive giant reed populations located within the project footprint and be replaced with native vegetation.

2.3.7 Project Design Avoidance and Minimization Measures

To avoid and minimize effects to special-status species and their habitats within the project limits, Caltrans would implement the following general measures:

BIOLOGY-1.Permits. Caltrans will include a copy of the all relevant permits within the construction bid package of the proposed project. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the USFWS Biological Opinion (BO) and the CDFW Incidental Take Permit.

BIOLOGY-2.Biological Monitor Approval. Caltrans will submit the names and qualifications of the biological monitor(s) for USFWS approval prior to initiating construction activities for the proposed project.

BIOLOGY-3.Biological Monitoring. The agency-approved biologist(s) will be on-site during initial ground-disturbing activities, and thereafter as needed to fulfill the role of the approved biologist as specified in project permits. The biologist(s) will keep copies of applicable permits in their possession when on-site. Through the Resident Engineer or their designee, the agency-approved biologist(s) shall be given the authority to communicate either verbally, by telephone, email or hardcopy with all project personnel to ensure that take of listed species is minimized and permit requirements are fully implemented. Through the Resident Engineer or their designee, the agency-approved biologist(s) shall have the authority to stop project activities to minimize take of listed species or if he/she determines that any permit requirements are not fully implemented. If the agency-approved biologist(s) exercises this authority, the agencies shall be notified by telephone and email within 48 hours.

BIOLOGY-4.Worker Environmental Awareness Training. All construction personnel will attend a mandatory environmental education program delivered by an agency-approved biologist prior to working on the project.

BIOLOGY-5.Pre-construction Surveys. Prior to any ground disturbance, pre-construction surveys will be conducted by an agency-approved biologist for listed species. These surveys will consist of walking surveys of the project limits and, if possible, accessible adjacent areas within at least 50 feet of the project limits. The biologist(s) will investigate all potential cover sites. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris. Native vertebrates found in the cover sites within the project limits will be documented and relocated to an adequate cover site in the vicinity.

BIOLOGY-6.Prevention of Wildlife Entrapment. To prevent inadvertent entrapment of listed species during construction, excavated holes or trenches more than one foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional four-foot high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional four-foot high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately

place escape ramps or other appropriate structures to allow the animal to escape or the USFWS will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours.

BIOLOGY-7.Wildlife Exclusion Fencing. The limits of construction zones within suitable habitat for listed species will be delineated with high visibility wildlife exclusion fencing at least four feet in height to prevent wildlife from accessing the construction footprint. The fencing will be removed only when all construction equipment is removed from the site. No project activities will occur outside the delineated project area. Wildlife exclusion fencing is not required for construction activities occurring outside of suitable habitat for listed species.

BIOLOGY-8.Listed Species On Site. The Resident Engineer will immediately contact the agency-approved project biologist(s) in the event that an AWS or CRLF is observed within a construction zone. The Resident Engineer will suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or an agency approved protocol for removal has been established.

BIOLOGY-9.Work Window. All work within suitable aquatic habitat for steelhead and California red-legged frog will occur between June 1 and October 15, when there is less potential for an individual to enter the work area. All work within suitable upland habitat for California red-legged frog and AWS will occur between March 1 and November 30. During this time, AWS is typically active and able to move away from construction activities to avoid harm, and CRLF will have a lower potential for movements across upland habitat.

BIOLOGY-10.Work Window for Nesting Birds. To the extent practicable, clearing and grubbing activities will be conducted during the non-nesting season, from September 1 to February 14.

BIOLOGY-11.Pre-construction Surveys for Nesting Birds. Pre-construction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to the start of construction for activities occurring during the breeding season (February 15 to August 31).

BIOLOGY-12.Non-Disturbance Buffer for Nesting Birds. If work is to occur within 300 feet of active raptor nests or 50 feet of active passerine nests, a non-disturbance buffer will be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential disturbance.

BIOLOGY-13.Bat Day and Night Roost Avoidance. Specific day and night bat roost avoidance and minimization measure will be developed through technical assistance with CDFW and bat specialists.

BIOLOGY-14.Incorporation of Bat Roosting Habitat into New Bridge: Bridge elements and configurations that support night and day roosting should be installed where feasible in the new Alameda Creek Bridge. Bridge replacements should consider use of a similar bridge design when the roost is large, unique or supports a rare species. Critical issues include access, ventilation, and protection. Crevice roosts should be replaced with crevices of similar area and cavities should be replaced with cavities of similar parameters. If this is not possible due to engineering requirements, e.g., safety, replacement habitat may be considered. Supplemental habitat may also be considered when exclusion will occur for more than one season.

BIOLOGY-15.Exclusion of Bats from Existing Bridge: Prior to the de-construction of the existing Alameda Creek Bridge, a roosting bat exclusion plan will be developed and implemented. At a minimum, this plan should address how one-way exclusion devices will be used to allow bats to safely exit the current bridge prior to its removal. Exclusion of bats would only occur between October and March to avoid the reproductive season.

BIOLOGY-16.Water Diversion Structures. Cofferdam and/or water diversion will be constructed to exclude construction activities from adversely impacting the water quality of Alameda Creek while maintaining flow through the project area. The contractor will be required to submit a Water Diversion Plan to appropriate regulatory agencies for approval prior to construction.

BIOLOGY-17.Water Quality Inspection. Water quality inspector(s) will inspect the site after a rain event to ensure that the stormwater BMPs are adequate.

BIOLOGY-18.Vehicle Use. Project employees will be required to comply with guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

BIOLOGY-19.Night Work. To the extent practicable, nighttime construction will be minimized.

BIOLOGY-20.Night Lighting. Artificial lighting of the proposed project area during nighttime hours will be minimized to the maximum extent practicable.

BIOLOGY-21.Trash Control. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the work area.

BIOLOGY-22.Firearms. No firearms will be allowed in the project area except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

BIOLOGY-23.Pets. To prevent harassment, injury or mortality of sensitive species, no pets will be permitted on the project site.

BIOLOGY-24.Caltrans Standard BMPs. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The SWRQCB has issued a National Pollution Discharge Elimination System Statewide Storm Water Permit to Caltrans to regulate storm water and non-storm water discharges from Caltrans facilities. A SWPPP will be developed for the project, as one is required for all projects that have at least 1.0 acre of soil disturbance. The SWPPP complies with the Caltrans Storm Water Management Plan (SWMP). The SWMP includes guidance for Design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges.

The SWPPP will reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges and can be found at the following website: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

Protective measures will be included in the contract, including, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning are allowed into the storm drain or water courses.
b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses.
c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.
d. Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.
e. Coir rolls will be installed along or at the base of slopes during construction to capture sediment and temporary organic hydro-mulching will be applied to all unfinished disturbed and graded areas.
f. Work areas where temporary disturbance has removed the pre-existing vegetation will be restored and re-seeded with a native seed mix.
g. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls along toe of slopes or along edges of designated staging areas, and erosion-control netting (such as jute or coir) as appropriate.
h. A Revegetation Plan will be prepared for restoration of temporary work areas. Pavement and base will be removed; topography blended with the surrounding area; and topsoil will be salvaged from the new alignment area to be placed over the restored area, which will then be revegetated with native grassland species.

BIOLOGY-25.Monofilament Erosion Control. Plastic mono-filament netting (erosion control matting) or similar material will not be used for the project because CRLF and AWS may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

BIOLOGY-26.Concrete Waste and Stockpiles. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage feature.

BIOLOGY-27.Revegetation Following Construction. All areas that are temporarily affected during construction will be revegetated with an assemblage of native grass, shrub, and trees as appropriate. Invasive, exotic plants will be controlled within the project area to the maximum extent practicable, pursuant to Executive Order 13112.

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines which defines cumulative impacts as two or more individual effects which when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The No-Build Alternative is not a project. This section evaluates only the cumulative effects of the Build Alternatives. The No-Build Alternative would not contribute to cumulative environmental effects in combination with other projects.

2.4.2 Projects Considered for Cumulative Impact Analysis

Caltrans collected information on past, present, and reasonably foreseeable future projects through research and coordination with the County of Alameda, the City of Fremont, and landowners in the Niles Canyon corridor, including ACFCD, ACWD, SFPUC, and EBRPD. A summary of these past, present, and future actions listing the proponent, status, location, and description of the project is included in Table 23. List of Projects Considered for Cumulative Impact Analysis.

PG&E's Pipeline Pathways Program was considered for inclusion in this cumulative impact analysis. However, PG&E's Pipeline Pathways Program is still in the scoping and development process and has not officially begun the environmental process. Therefore, this project is not included as a project considered as part of the cumulative impact analysis.

Table 23. List of Projects Considered for Cumulative Impact Analysis

Project Proponent/Name	Project Status	Location	Project Description
Caltrans/Niles Canyon Short Term Improvements Project (also called the Niles Canyon Minor Safety Improvements Project)	Future project; project is currently in design. Anticipated construction date is summer 2015.	Niles Canyon Corridor, SR-84 from Mission Boulevard (SR-238) to I-680.	The project will conduct various safety improvements along the Niles Canyon corridor; all improvements will be made on paved surfaces. Off pavement work is not authorized.
Caltrans/Niles Canyon Safety Improvements Project	Future project; project is currently in the environmental phase. The draft Environmental Document is expected in 2015.	Niles Canyon Corridor, SR-84 from Mission Boulevard (SR-238) to I-680.	The project will conduct various safety improvements including the installation of rock drapery systems, curve correction, and the addition of spot shoulder widening and guard railing.
Caltrans/Niles 1	Past project; project was terminated.	Western portion of the Niles Canyon Corridor, SR-84 from Mission Boulevard (SR-238) to the Alameda Creek Bridge.	The project was terminated in 2011. However, prior to construction, approximately 150 native trees in the project limits were removed.
Caltrans/Pigeon Pass Realignment	Past project; construction completed.	SR-84, between I-680 and I-580.	The project realigned the two-lane state route facility to improve the horizontal and vertical alignment, added standard outside shoulders, a median buffer, and climbing lanes in each direction.
Caltrans/Arroyo de la Laguna Bridge Improvement	Future project; project is in the early planning stages and is expected to begin the environmental phase in Winter 2015.	SR-84, near the town of Sunol.	The project proposes to widen the bridge by three feet. Widening will be done to the extent feasible without adding any additional substructures.
Caltrans/I-680 Northbound HOV/Express Lane Project	Future project; project is currently in the	I-680, from Calaveras Road (SR- 237) to Vallecitos Road	The project proposes to reduce traffic congestion along northbound I-680 from

Project Proponent/Name	Project Status	Location	Project Description
	environmental phase. The draft Environmental Document was released in November 2014. .	(SR-84).	Stoneridge Drive Interchange in the City of Pleasanton to SR-237 in the City of Milpitas through construction of a HOV lane from SR-84 to SR-237. The construction of auxiliary lanes will occur from Washington Boulevard to Auto Mall Parkway, from South Mission Blvd (SR-262) to Scott Creek Road, and from Scott Creek Road to Jacklin Road. Additionally, there will be installation of ramp metering facilities on southbound on-ramps from Stoneridge Drive to Jacklin Road.
Alameda County Water District/Kaiser Fish Screen Project	Future project; construction is anticipated in 2015-2016.	In the City of Fremont, along the north side of the ACFCD Channel, upstream of ACWD Rubber Dam Number 1.	The project involves construction of a new diversion pipeline and cylindrical fish screen in order to abandon the existing unscreened pipeline. The replacement facility will be constructed about 530 feet downstream of the existing diversion pipe and 2,400 feet upstream of ACWD's Rubber Dam 1 where the Union Pacific Railroad and BART Bridges cross over Alameda Creek. The purpose of this action is to prevent fish in the vicinity of this diversion from being entrained into ACWD’s groundwater recharge basins.
Alameda County Water District/Niles Cone Saltwater Intrusion and	Future project; environmental phase approved in June 2014 and	Four locations on public lands operated and managed by the Don Edwards San	The project will install six groundwater monitoring wells at four sites in the southern and western sections of the

Project Proponent/Name	Project Status	Location	Project Description
Aquifer Characterization Project	construction date unknown.	Francisco Bay National Wildlife Refuge.	Niles Cone Groundwater Basin. The purpose of drilling these wells is to explore the subsurface geology in the sensitive area where Department of Water Resources has documented inferred major deposited channels to further evaluate the extent of brackish water near the Mowry Wellfield. The complete project will consist of below-ground well installation with at grade surface completion.
Alameda County Water District /Alameda County Flood Control District - Joint Lower Alameda Creek Fish passage improvements	Future project; construction planned for Summer 2016.	Alameda Creek, between Mission Boulevard and the Alameda County Flood Control District drop structure between the Union Pacific Railroad and BART Bridge.	The Alameda County Water District and Alameda County Flood Control District propose to construct a new fish ladder at Alameda County Water District's rubber dam 1 and Alameda County Flood Control's drop structure, a new fish ladder at ACWD's rubber dam 3, replace the existing rubber dam 1 bag, equipment and controls with new materials, and construct a new Shinn diversion and fish screening facility and decommission the existing unscreened. The purpose of these actions is to allow fish to migrate past the rubber dams, drop structure and diversion pipes in the reach of Alameda Creek between Mission Boulevard and Fernwood Court, Fremont, CA.

Project Proponent/Name	Project Status	Location	Project Description
City of Fremont/Old Canyon Road Bridge Foundation Protection Repair Project	Future project; Environmental Document circulated August 2014 for public comment.	City of Fremont on the Old Canyon Road, near Mission Boulevard and Niles Canyon Road. Project location is 0.1 mile northeast of SR-84.	The project would stabilize the Old Canyon Bridge footings by replacing the rock rip-rap and installing the cobble in the Alameda Creek channel.
City of Fremont/Mission Clay Quarry Amended Reclamation Plan	Past project; construction completed.	Mission Clay Products Quarry, 2225 Old Canyon Road, Fremont	The project is an amendment to the reclamation plan previously approved in 2005 for the former Mission Clay Products quarry and brick clay pipe manufacturing factory located in Niles Canyon. The approved reclamation plans affects 19-acres of the property and proposes to dismantle all remaining structures, break up and remove all impervious surfaces, clean up and dispose of all debris off site, re-grade disturbed areas to a topography that blends with the surrounding geography and is geologically stable, and revegetate all disturbed soils to prevent erosion and allow for the establishment of native plant communities consistent with the surrounding area. The proposed end use for the site continues to be "Open Space", consistent with the current City of Fremont General Plan land use and zoning designations.
City of Fremont/Stevenson Place General Plan Amendment	Future project; Environmental Document circulated in spring 2014 for	City of Fremont, south side of Stevenson Boulevard, west of Stevenson Place.	The proposed project includes a General Plan Amendment to change the land use designation for a 1.9-acre property from

Project Proponent/Name	Project Status	Location	Project Description
	public comment.		General Commercial to Medium Density Residential. The property is currently zoned Planned District, which allows for business park development. The applicant is proposing to rezone the Property to Preliminary Planned District. All development for the Preliminary Planned District would be in accordance with the Medium Density A preliminary conceptual plan has been provided by the applicant for the purposes of CEQA analysis. The conceptual plan would develop the 1.9-acre site with up to 66 units. The conceptual plan provided for the purpose of CEQA analysis includes 132 parking spaces, private driveways and 6,000 square feet of common open space. Other ancillary improvements would include exterior flatwork, underground utilities, landscaping and driveways. The project would also include a future subdivision map.
City of Fremont/Mission Boulevard Townhomes	Future project; Environmental Document circulated in spring 2014 for public comment.	City of Fremont, 39311 Mission Boulevard.	The project will rezone 1.91-acres located along Mission Boulevard to allow the development of 33-unit townhouse style condominium project.
City of Fremont/Shannon Townhomes	Future project; environmental document circulated in spring 2014 for review.	City of Fremont, 38861 and 38873 Mission Boulevard	The project will rezone 1.51-acres to create a 25-unit townhouse development subdivision.

Project Proponent/Name	Project Status	Location	Project Description
City of Fremont/Gwalani General Plan Amendment and Planned District	Future project; currently in the environmental phase.	City of Fremont, 38437 Mission Blvd	The project will demolish an existing 1,850-square foot single-family house and garage for the purpose of developing a 5,200-square-foot one story medical office building on a 0.46-acre lot.
Alameda County Flood Control and Water Conservation District/Floodwall Improvements Along Zone 3A Line D: Phase 2, Between Huntwood Avenue and Bart, Hayward, California or Ward Creek Project	Future project; environmental phase completed in April 2014. Anticipated construction date is unknown.	City of Hayward, between Huntwood Avenue and Hayward BART station.	The project will install floodwalls along approximately 1,630 linear feet of the Zone 3A, Line D channel (Ward Creek) between Huntwood Avenue, and the Union Pacific Railroads.
Alameda County/Sunol Fire Station	Future project; environmental phase completed July 2014. Anticipated construction date is unknown.	Town of Sunol on Paloma Way near Pleasanton- Sunol Road	The proposed project would include a pre-fabricated 2,000 square foot fire station that would house three fire fighters, as well as a 2,500 square foot garage adjacent to the main building that would house up to three firefighting apparatus. The main access to the facilities would be through unpaved roads covered with aggregate. The site would be completed with some concrete walkways and a deck attached to the station.
Alameda County/Maintenance and	Past project; construction completed.	Sunol Valley Golf Course	The project, located at Sunol Valley Golf Course in Alameda County,

Project Proponent/Name	Project Status	Location	Project Description
Facility and Irrigation Pond Improvement Project			includes improvement of the spillways at Pond 3 and Pond 4; relocation of the irrigation water pump system at Pond 5; relocation and improvements of the existing access road to Pond 3 to allow for heavy equipment access to the Pond 3 spillway; filling in the area below the existing spillway at Pond 3 to protect the petroleum pipeline from erosion; raising the level of the existing earthen dam at Pond 3 approximately 2 feet to allow for construction of new spillway (will not increase capacity of Pond 3); and stream channel restoration downstream of Pond as part of mitigation for the overall project.
San Francisco City and County - SFPUC/Sunol and Niles Dam Removal	Past project; construction completed in 2006.	The Sunol Dam is located in the Niles Canyon reach of Alameda Creek at river mile 16.2. SR-84 (Niles Canyon Road) parallels the creek through Niles Canyon, and lies to the north of the dam. Niles Dam is located on Alameda Creek at river mile 12.8, near the downstream end of Niles Canyon. SR-84 (Niles Canyon Road) lies directly adjacent to the dam site.	The project involves partial removal of Sunol and Niles Dams to remove barriers to fish passage and reduce or eliminate an existing public safety hazard and related SFPUC risk management concerns. In association with the removal of the dams, impounded sediment would be left in place to move downstream naturally over a period of several decades.

Project Proponent/Name	Project Status	Location	Project Description
Alameda County/Proposed Expansion/Deepening of Surface Mining Permit, Mission Valley Rock Company Quarry	Past project; environmental completed in 2002.	City of Fremont at the Quarry Lakes.	The project proposes to modify the original quarry and reclamation plan by expanding the amount of volume of material that could be removed. This expansion would involve both deepening of the existing pit from 140 feet to as much as 200 feet, and to expand the footprint of the quarry by six acres toward the east, onto the lands of SFWD and nearer to the streambed of Alameda Creek. The life of the quarry, currently ending by the year 2045, would not be extended. With the proposed expansion, the quarry pit would cover up to about 37-acres. A total of about 400,000 additional tons of marketable mineral commodities, over and above that already permitted, would be mined during the permit period, after which reclamation would occur. The ancillary use area would remain unchanged.
Alameda County Water District/ Alameda Creek Pipeline Number 1 Fish Screen and Lago Los Osos Pipeline Project	Past project; construction completed in Winter 2014.	City of Fremont, Mission Blvd to Isherwood Way.	The project consists of installation of fish screens for an existing water diversion, removal of an inflatable rubber dam fabric, modification of the dam's foundation to provide for fish passage, and construction of a pipeline under Alameda Creek to connect recharge basins on the north and south

Project Proponent/Name	Project Status	Location	Project Description
			sides of the Creek.
Alameda County Water District/Appian Tank Seismic Upgrade Project	Future project; construction planned for January 2015.	Various locations in Fremont and Union City.	The project will implement the Appian Tank Seismic Upgrade Project located within the cities of Fremont and Union City, CA. The proposed project consists of replacing the existing water storage tank in the Fremont city limits along with replacing a storm drain outfall and installing auxiliary improvements at the tank site. The existing access road would be rehabilitated, an existing water pipeline along the access road would be replaced by a new pipeline, and a new power line would be installed along the existing access road, which is located within the city limits of Union City and Fremont.
Alameda County Water District/Vallecitos Channel Repair	Future project; construction planned for winter 2014/2015.	City of Fremont, SR-84 at Vallecitos Lane	The project will improve an existing unlined water conveyance channel and adjacent access road. The purpose of the work is to repair localized bank damage, prevent further erosion, and restore channel hydraulics and water conveyance efficiency. The project involves the installation of vegetated soil lift revetment, installation of transverse log stabilizers, and installation of a low-flow channel.
San Francisco City and County - SFPUC/Geary	Past project; construction completed.	Sunol Ohlone Wilderness Park, approximately seven	The project involves the construction of a new 150-foot long concrete and

Project Proponent/Name	Project Status	Location	Project Description
Road Bridge Replacement Project		miles south of the town of Sunol.	weathered steel bridge that crosses Alameda Creek.
San Francisco City and County - SFPUC/New Irvington Tunnel Project	Currently in construction; construction anticipated to be completed fall 2015.	Sunol Valley, from the new Alameda West Portal on the west side of the Sunol Valley to the new Irvington Portal in the City of Fremont.	The proposed New Irvington Tunnel project is approximately 3.5 miles long, extending west from the new Alameda West Portal on the west side of the Sunol Valley to the new Irvington Portal in the City of Fremont. The new tunnel would be located south and approximately parallel to the existing tunnel, separated by a distance of approximately 100 feet to 700 feet from the existing tunnel. The final internal diameter of the tunnel would be between 8.5 feet and 10.5 feet. The depth of the tunnel would range from approximately 30 feet below ground surface at the portals to 700 feet below the techniques. The purpose of this project is to construct a new tunnel that would be built using modern earthquake engineering designs, materialis and technology resulting in more resistance to damage during major seismic events, allow the SFPUC to take the existing tunnel out of service for inspection, maintenance, and repairs, and improve overall system delivery reliability by providing a redundant tunnel in the event of a major seismic event or other

Project Proponent/Name	Project Status	Location	Project Description
			impact on the existing tunnel requiring maintenance and/or repair.
San Francisco City and County - SFPUC/Bay Development Pipeline Reliability (BDPL) Upgrade	Past project; construction completed.	The start point is in the City of Fremont, approximately 100 feet east of Mission Boulevard, and continues westward through Fremont and Newark and would cross the Bay to Menlo Park.	The project would be constructed as a 21 mile pipeline, parallel to, and within the existing right-of-way of Bay Development Pipeline Numbers 1 and 2, which originate at the Irvington Tunnel Portal in Fremont, pass through the cities of Fremont and Newark in Alameda County, cross the Bay at the Dumbarton Strait, and continue through the cities of East Pal Alto, Redwood City, Menlo Park, and unincorporated areas of San Mateo County. The project (also referred to as "BDPL No. 5") would include a seven-mile "reach" (or sub-segment) in the East Bay that begins approximately 100 feet east of Mission Boulevard, near the Irvington Tunnel Portal, and continues westward through the cities of Fremont and Newark to the Newark Valve Lot. A proposed five-mile tunnel would extend from the Newark Valve Lot to the Ravenswood Valve Lot in Menlo Park, crossing beneath the Bay. From the Ravenswood Valve Lot, BDPL No. 5 would extend nine miles westward to the Pulgas Tunnel Portal in unincorporated San Mateo County. The project would also

Project Proponent/Name	Project Status	Location	Project Description
			include: new facilities at six existing valve lot locations, including new concrete vale vaults and control buildings that house electrical control panels, isolation valves, mechanical equipment, and cross-connections between BDPL No. 5 and the existing BDPL No. 1 and 2; new flow-metering vaults at Driscoll Road in Fremont and Hassler Road in Redwood City; and a new fiber optic cable installed on existing towers between PG&E's Ravenswood Substation in Menlo Park and its Ames Substation in Mountain View.
Alameda County Resource Conservation District/Natural Resources Conservation Service/Stonybrook Creek Fish Passage Improvement Project	Future project; environmental document was circulated for public review and comment in winter 2014. Anticipated construction date is unknown.	Stonybrook Creek, SR-84 near Palomares Road	This proposed project consists of two culvert improvements that cross Stonybrook Creek along the County of Alameda maintained Palomares Road at Mile Posts 8.60 and 8.75. It has been determined that both culverts are barriers to all lifestages of anadromous fish, including federally listed Distinct Population Segment (DPS) Central Coast California steelhead trout (*Oncorhynchus mykiss*). The primary concerns that led the sponsor, the Alameda County Resource Conservation District (ACRCD), to propose the Stonybrook Creek project are: a)

Project Proponent/Name	Project Status	Location	Project Description
			presence of barriers to migration of anadromous Central Coast California steelhead and resident rainbow trout to identified spawning and rearing habitat in Stonybrook canyon and b) a concern for damage to public infrastructure and private property due to undersized crossings.
Alameda County Resource Conservation District/Arroyo de la Laguna Stream Restoration Project	Past project; restoration completed in 2011.	Arroyo de la Laguna stream; directly underneath and immediately downstream of Verona Bridge, between Pleasanton and Sunol.	The project will demonstrate bioengineered stream restoration practices on an incised, hydrologically altered system, affected by urban and agricultural development. The project site is on the Arroyo de la Laguna, south of City of Pleasanton, directly underneath and immediately downstream of Verona Bridge, corner of Verona Bridge and Foothill Road.

2.4.3 Resource Areas with No Contribution to Cumulative Impacts

The resources considered in the cumulative impact analysis follow Caltrans' Eight Step Guidance for identifying and assessing cumulative impacts (Caltrans, 2005). No cumulative impacts are anticipated for the following resource areas:

SELECTED BIOLOGICAL RESOURCES

- Plant species
- River Lamprey and Pacific Lamprey
- Western Pond Turtle
- San Francisco Dusky-Footed Woodrat
- Migratory Birds (Cooper's hawk, White-tailed kite, yellow warbler, heron and egret rookeries including great blue heron, great egret, snowy egret, and black-crowned night heron)

The amount and quality of these species' habitat impacted by the proposed project will not affect local populations. Project Design avoidance and minimization measures listed in Section 2.3.7 will reduce and avoid effects to these species' during project construction. Furthermore, impacts to the habitat of many of these species' from the Alameda Creek Bridge Replacement Project would be off-set through on-site restoration and enhancement activities. As a result, impacts to these species' as a result of the proposed project is anticipated to be minimal and will not result in the contribution of any cumulative effects to these species.

CULTURAL RESOURCES (ARCHEOLOGY)

The project vicinity does not contain any known archeological resources. While it is not anticipated that the proposed project will directly or indirectly impact archeological resources, avoidance and minimization measures are in place to protect archeological resources in the event of an inadvertent discovery. Cultural resource studies indicate the project will not impact archeological resources and therefore, there is no potential for cumulative impacts to cultural resources (archeology).

GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

Although the project will be constructed in a seismically active region, Caltrans' structures are designed using the Caltrans' Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. The Alameda Creek Bridge Replacement design incorporates features to reduce impacts as a result of geologic and seismic conditions. These design features include, but are not limited to, designing the new Alameda Creek Bridge to withstand a defined level of bedrock acceleration and driving piles below liquefiable layers. In consideration of building to SDC criteria, there is no potential for cumulative seismic impacts.

The soils located in the project vicinity are subject to severe erosion; project construction activities, such as grading and excavation, could impact the stability of existing soils and increase the overall potential for soil erosion. However, based on the review of reasonably foreseeable projects, no projects are proposed in the immediate project area.

No further impacts to the slope located in the project vicinity are anticipated, and there is no potential for cumulative impacts to the geology/soils/topography of the area.

HAZARDOUS WASTE/MATERIALS

The project will produce some hazardous waste during the project demolition activities. The disposal of materials containing ACM and LBP will be done in accordance with all federal and state rules and regulations. No cumulative hazardous waste/material impacts are anticipated as a result of the Alameda Creek Bridge Replacement Project.

LAND USE

Although the proposed project involves the acquisition of minor parcels from Alameda County, the SFWD, the ACWD, and the SFPUC, land use in the Niles Canyon corridor is protected by Alameda County's Save Agriculture and Open Space Lands Initiative and the City of Fremont's Measure T, the Hill Area Initiative. Niles Canyon is further protected from development by the fact that public agencies own the majority of the undeveloped lands in Niles Canyon. There are no immediate plans or trends for development in the Niles Canyon Corridor; approximately 131,700 square feet will be converted from open space to transportation use in order to construct the new alignment of the Alameda Creek Bridge. Based on the negligible change in land use for transportation purposes, and the fact that Niles Canyon is protected from development, no cumulative land use impacts are anticipated.

PALEONTOLOGY

The specific locations of the paleontological resources are unknown; impacts are not predetermined and cannot be quantified until after construction begins. In this case, it is possible that potentially sensitive geological units in the project area could be exposed during ground-disturbing construction activities. If no protective measures were employed, then paleontological resources may be destroyed by construction activities and/or left unrecorded for their scientific value. However, even if discoveries occur in the project area, sensitive geologic units cannot be quantified as a cumulative impact. A paleontological impact could be quantified as cumulative only if it occurred in the exact same project area and the exact same geologic units were to be affected by a past, future, or foreseeable project. Neither of these statements is true when applied to the proposed project. Therefore, direct or indirect cumulative impacts related to paleontological resources are not anticipated to result. In addition, the Alameda Creek Bridge Replacement Project proposes implementation of the mitigation measures that would effectively recover the scientific value of any fossils discovered during construction. No cumulative paleontological impacts are anticipated as a result of the Alameda Creek Bridge Replacement Project.

PARKS/RECREATIONAL FACILITIES

The Niles Canyon Railway is the only existing park and recreational facility identified within 0.5 miles of the project. During construction activities, noise levels will temporarily increase and passengers will experience temporary aesthetics/visual impacts while passing the project vicinity. No direct or long-term impacts to the Niles Canyon

Railway are expected. Therefore, the proposed project does not have the potential to contribute cumulative impacts on the parks/recreational facilities in the area.

TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES

From postmile 13.0 to postmile 13.6, the project would maintain the posted regulatory 45 mph speed limit on SR-84. Advisory signage recommending a lower speed on the bridge and its approaches would be removed. This increase in the length of roadway with a design speed that matches the regulatory speed limit is part of the new Alameda Creek Bridge design that will correct existing deficiencies of the facility.

The removal of the lower-speed advisory is not an impact as long as the facility is designed to accommodate the change in posted speed. The new Alameda Creek Bridge is designed to accommodate the 45 mph regulatory speed limit and design features of the new bridge have been incorporated to keep vehicular traffic at the posted speed 45 mph speed limit. One specific feature is the installation of a two-foot soft median barrier (suitable for a rumble strip). Centerline-rumble strips are an effective countermeasure to prevent head-on collisions and opposite direction sideswipes, also referred to as cross-over or cross-centerline crashes (U.S. Federal Highway Administration, 2011).

Additionally, the other two Caltrans projects planned for the Niles Canyon corridor will ultimately help to keep vehicular speed within the existing posted speed limits by implementing measures that intend to reduce motorist speed. The first project, the Niles Canyon Short Term Improvements Project, involves the application of approximately 58 sharrows or pavement markings to warn motor vehicles that bicyclists have a right to occupy the whole travel lane, the installation of optical speed bars designed to cause motorists to reduce speed, and the installation of median rumble strips at several locations. The second project, the Niles Canyon Safety Improvements Project, involves the installation of vehicle speed feedback signs throughout various locations in the Niles Canyon corridor, and the installation of two dynamic active warning systems at the Silver Springs Undercrossing and the Palomares Intersection. At the Silver Springs Undercrossing, the dynamic warning system will signal when traffic, not visible to the approaching motorists, has backed up within the undercrossing. At the Palomares intersection, the dynamic warning system will signal to motorists on SR-84 that vehicles on Palomares are waiting to make a left turn. The Niles Canyon Safety Improvements Project also involves a segment of curve correction at the curve located east of the Alameda Creek Bridge and the addition of curve warning signs. The numbers of motorists driving in excess of posted speeds is anticipated to be reduced by the application of these measures.

Out of all three Caltrans' proposed projects for the Niles Canyon corridor, the Alameda Creek Bridge Replacement Project is the only location in the Niles Canyon corridor where Caltrans proposes to remove the posted lower-speed advisory signs. The features of the Alameda Creek Bridge Replacement Project, in combination with the other planned improvements for Niles Canyon, will improve safety. No cumulative impacts to traffic and transportation/pedestrian and bicycle facilities are anticipated as a result of the proposed project.

UTILITIES/EMERGENCY SERVICES

The project involves the relocation of two utility power poles. No other direct or indirect impacts to utilities/emergency services are expected as a result of the Alameda Creek Bridge Replacement Project. The Niles Canyon corridor is mostly undeveloped land, owned by public agencies. A review of projects in the area indicate few actions affecting utilities/emergency services have occurred or will occur as a result of past, present, and future actions. No cumulative impacts to utilities/emergency services are anticipated.

2.4.4 Resources Considered for Cumulative Impact Analysis

2.4.4.1 Visual/Aesthetics

The project will have impacts to the visual/aesthetic quality of 0.6 miles of SR-84, a State Scenic Highway corridor. Therefore, visual/aesthetics is a resource considered for cumulative impact analysis. The Resource Study Area (RSA) for visual/aesthetics cumulative impact analysis is established from the SR-84/SR-238 intersection up to the SR-84/I-680 Interchange. This area was chosen as the RSA because it encompasses the Scenic Highway portion of SR-84, is consistently rural in nature, with rolling/steep hills and vegetation, and has little urban or commercial development visible from the highway. Based on research and historical data and recent trends, the overall health of the visual/aesthetic resources in the RSA is assumed to be stable with a minor decline over the past three years stemming from Caltrans' Niles 1 Project. In 2011, Caltrans' Niles 1 Project involved the removal of approximately 150 native trees on SR-84 between postmiles 12.1 to 13.3. Caltrans ended up terminating the project, but has yet to provide mitigation for these trees impacted during the preliminary construction efforts of the Niles 1 Project. Overall, the health of trees in the RSA is stable with a minor decline over the past three years stemming from Caltrans' Niles 1 Project.

In addition to the activism of grassroots groups, the passage of Measure D and Measure T and the adoption of a State Scenic Highway Corridor Plan are two critical trends contributing to the stability of the visual/aesthetic resources in the Niles Canyon Area.

The passage of Measure D, Save Agriculture and Open Space Lands Initiative in November 2000 has been critical in the preservation of agricultural land and open space in Alameda County. Approval of this citizen sponsored ballot measure amends the Alameda County General Plan and the regionally specific East County Area Plan (of which the Niles Canyon corridor is a part) to further restrict development. The initiative provides detailed land and site planning requirements that discourages contemporary sprawl development. Alameda County also has a number of site, building, and landscape design criteria that are part of the policy framework of the East County Area Plan and provide an added layer of protection to the scenic quality of the Niles Canyon Corridor. Similar to Alameda County's Save Agriculture and Open Space Lands Initiative, the City of Fremont electorate passed Measure T, also known as the Hill Area Initiative, in 2002. The Hill Area Initiative was incorporated into the City of Fremont's Municipal Code and protects open space and discourages over-development in the Fremont Hills. Development within the designated Hillside Area must conform to numerous special restrictions. Both Measures D and T protect the scenic quality of the Niles Canyon Corridor and preserve open space.

Another critical contribution to the stability of the visual/aesthetic quality of this portion of SR-84 was the development of a Scenic Corridor Protection Plan for the Niles Canyon Road and Paloma Way. The development of the plan began in 2003 with the Caltrans Advisory Committee unanimously approving the application submitted by the County of Alameda, the City of Fremont, and Union City. This application began the process of obtaining State Scenic Highway designation for the Niles Canyon and Paloma Way portion of SR-84. A scenic corridor protection plan was submitted to Caltrans in February 2007. The implementation of the Niles Canyon Corridor Protection Program protects and enhances the scenic resources along 7.2 miles of SR-84. The Program protects the scenic corridor from the encroachment of incompatible land uses, prohibits billboards and regulates on-site signs, regulates grading to prevent erosion and cause minimal alteration of existing contours, and preserves important vegetative features along the highway (Alameda County, 2007).

The historical context of the Niles Canyon Corridor indicates high value of its scenic beauty and frequent use in the past as a recreational destination. In a long-range historical context, trains through Sunol and Niles Canyon served as the easiest way to travel to and from Bay Area cities during the late 1800s. The Essanay Film Manufacturing Company set up a studio in the town of Niles from 1912-1916 and produced many films using the canyon's scenic backdrop. In the 1920s and 1930s, auto clubs promoted Niles Canyon as a day trip destination. The scenic beauty of Niles Canyon, and its accessibility from the urban areas of San Francisco and Oakland, led to the development of recreational picnic-grounds in the canyon (these recreational picnic-ground no longer exist) and hotels in Sunol. These factors demonstrate a historic stability in the health of visual/aesthetic resources in Niles Canyon.

All Build Alternatives will have visual/aesthetics impacts to 0.6 miles of the Niles Canyon Scenic Corridor. As a context sensitive solution, all Build Alternatives propose the use of the Texas Bridge Railing (C412), a see-through bridge railing to match the bridge railing of the existing Alameda Creek Bridge. Section 2.1.5 Aesthetics/Visual summarizes potential impacts to visual/aesthetics from the various key viewpoints.

Visual/aesthetic change from key viewpoint KVP-3 could be high for Build Alternative 1 and could result in a substantial change for motorists. Impacts could potentially be reduced to a moderately high level with mitigation, but residual impacts would remain substantial. A change in the visual/aesthetics from all other key viewpoints for Build Alternative 1 would be moderate, and not substantially altered from existing conditions. Under Build Alternative 2, resource change from all key viewpoints would be moderate resulting in a slight, but not substantial change, to the visual/aesthetics of the project location. Under Build Alternative 3A, resource change from key viewpoint KVP-3 would be moderately high with recommended and proposed mitigation and minimization measures. Impacts of Build Alternative 3A from all other key viewpoints would be moderate, and not substantially altered from existing conditions. Under Build Alternative 3B, resource change from all key viewpoints would be moderate or moderately low, and

would not substantially alter the visual/aesthetic quality of the project limits from the existing condition.

All Build Alternatives will impact trees. Trees located in permanent impact areas are likely to be removed during project activities. Some trees located in temporary impact areas may be preserved depending on the specific activity occurring near them. To be conservative, Caltrans is accounting for removal of trees in temporary impact areas. Caltrans will make an effort to reduce impacts to trees in temporary impact areas to the greatest extent possible during construction. For the purpose of cumulative impact analysis, Caltrans will use the summation of both temporary and permanent impacts for calculating project's impact to trees. The impacts to trees in the project study limits vary by Build Alternative as demonstrated in the following tables:

Table 24. Impacts to Trees for Build Alternatives 1 and 2.

Species	Alternative 1 Permanent Impacts	Alternative 1 Temporary Impacts	Alternative 1 Total Impacts	Alternative 2 Permanent Impacts	Alternative 2 Temporary Impacts	Alternative 2 Total Impacts
Arroyo willow	0	11	**11**	6	5	**11**
Big-leaf maple	8	13	**21**	6	12	**18**
Black acacia	1	3	**4**	1	3	**4**
Blue elderberry	1	4	**5**	2	2	**4**
Box elder	0	1	**1**	0	1	**1**
California bay tree	43	56	**99**	25	36	**61**
California buckeye	6	3	**9**	0	2	**2**
Coast live oak	56	64	**120**	48	52	**100**
Eucalyptus species	8	4	**12**	12	0	**12**
Fremont cottonwood	0	12	**12**	3	9	**12**
Italian alder	0	1	**1**	0	1	**1**
N. CA black walnut	1	2	**3**	0	1	**1**
Ngaio	0	1	**1**	0	0	**0**
Plum species	1	1	**2**	0	1	**1**
Red willow	2	26	**28**	6	21	**27**
Western sycamore	25	38	**63**	11	35	**46**
White alder	0	23	**23**	4	19	**23**
Total	**152**	**263**	**415**	**124**	**200**	**324**

Table 25. Impacts to Trees for Build Alternatives 3A and 3B.

Species	Alternative 3A Permanent Impacts	Alternative 3A Temporary Impacts	Alternative 3A Total Impacts	Alternative 3B Permanent Impacts	Alternative 3B Temporary Impacts	Alternative 3B Total Impacts
Arroyo willow	4	7	**11**	0	5	**5**
Big-leaf maple	7	12	**19**	4	11	**15**
Black acacia	2	2	**4**	3	1	**4**
Blue elderberry	3	1	**4**	0	1	**1**
Box elder	0	1	**1**	0	1	**1**
California bay tree	37	32	**69**	22	20	**42**
California buckeye	7	1	**8**	7	1	**8**
Coast live oak	59	48	**107**	50	49	**99**
Eucalyptus species	12	0	**12**	6	0	**6**
Fremont cottonwood	1	11	**12**	0	9	**9**
Italian alder	0	1	**1**	0	1	**1**
N. CA black walnut	0	2	**2**	0	2	**2**
Plum species	0	1	**1**	0	1	**1**
Red willow	5	22	**27**	0	21	**21**
Western sycamore	16	36	**52**	16	35	**51**
White alder	1	22	**23**	0	18	**18**
Total	**154**	**199**	**353**	**108**	**176**	**284**

Alameda County Planning Department indicated that Caltrans projects are the only reasonably foreseeable projects planned in the Niles Canyon corridor (Piñon-Robinson, 2014). Future projects within the RSA include Caltrans Niles Canyon Short Term Improvements Projects, Niles Canyon Safety Improvements Project, and the Arroyo de la Laguna Bridge Project. The Niles Canyon Short-Term Improvements Project will not result in the loss of any trees and will have negligible impacts to visual/aesthetics of the Canyon. The Niles Canyon Short Term Improvements Project has completed its environmental phase and is now in the design phase. The Niles Canyon Safety Improvements Project is currently in the environmental phase and the draft Environmental Document is anticipated to be released in 2015. The Niles Canyon Safety Improvements Project will require tree removal in Niles Canyon. The exact number of trees to be removed has not been determined yet as the project is still in environmental phase. Project-specific trees impacts and the associated mitigation will be documented in its own biological study, estimated to be completed in early 2015. Preliminary estimates indicate that less than 100 trees will be removed as part of this project. The Niles Canyon Safety Improvements Project also proposes the installation of two rock drapery systems, and two to three feet tall Type 6 retaining walls, minor rock cuts, signalization of the Sunol-Pleasanton Road/Palomares Road Intersection, as well as roadside signs

throughout the corridor. The Arroyo de la Laguna Bridge Project is currently in the early planning phase and impacts to trees and mitigation associated with the project have not yet been fully determined. Preliminary estimates indicate some tree and shrub removal will occur within the project limits. Per Caltrans' Office of Landscape Architecture, visual impacts from this project are anticipated to be minimal.

The result of the analysis indicate that the proposed project, in combination with the future Niles Canyon Safety Improvements Project and Arroyo de la Laguna Bridge Project, and Caltrans' Niles 1 Project, do have a cumulative impact to visual/aesthetic resources in the RSA. To determine the Alameda Creek Bridge Replacement project's contribution to a cumulative effect on the Niles Canyon Scenic Corridor, impacts of the proposed project were considered from both short-term and long-term timelines. The impacts of the Alameda Creek Bridge Replacement Project, when viewed alongside the visual/aesthetics impacts of both past and future projects, will contribute to a short-term decline in the health of the visual/aesthetic quality of 0.6 miles of the Niles Canyon Corridor. Although the proposed project will contribute to a short-term decline in the health of the resource, the project's long-term effect on the health of visual/aesthetic resources is negligible. Caltrans' Office of Landscape Architecture estimates the aesthetic quality of the area affected by the project will rebound after ten to fifteen year period, once replanting regrowth occurs. Additionally, all Build Alternatives propose the use if feasible of the Texas Bridge Railing (C412), a concrete see-through bridge railing, to match the character of the existing Alameda Creek Bridge.

Build Alternative 1 would result in a larger impact to visual/aesthetics than Build Alternatives 2, 3A, and 3B. Under Build Alternative 1, motorists south of the replacement bridge will experience a decline in the visual character and quality of the Niles Canyon area due to the prominence of the proposed uphill soil-nail retaining wall. Build Alternatives 2, 3A, and 3B will result in a smaller contribution to the cumulative impact on visual/aesthetics due to their limited visibility and scope. Build Alternative 1 will result in an increased visual/aesthetic impact as a result of the construction of the 1,090 linear feet long concrete soil-nail wall adjacent to the roadway and larger amount of tree removal. Additionally, there will be increased impact of constructing the Type 1 downslope retaining wall from the Alameda Creek area in comparison to the construction of the sidehill viaduct and piles from the roadway as proposed in Build Alternatives 3A and 3B. As a result, construction of the sidehill viaduct would have less impact to Alameda Creek vegetation. Build Alternative 3A would result in a larger impact on the health of visual/aesthetics as a result of the construction of the two rock cuts, totaling 840 linear feet. In comparison, the rock cut for Build Alternative 3B totals only 300 linear feet. Since revegetation does not incorporate replanting of trees on the resulting ¾:1 slope, the rock cut will be visually apparent until the grasses and wildflowers fill in over time. Build Alternative 2 involves the construction of a Type 1 downslope retaining wall and 470 linear feet of rock cut. Build Alternative 2 would result in a smaller impact to the health of the visual/aesthetics than Build Alternatives 1 and 3A, but would have a greater visual/aesthetic impact than Build Alternative 3B. Based on this analysis and review, there is a cumulative impact to visual/aesthetics within the RSA as a result of past, present, and future actions. Although the magnitude of visual/aesthetic impact varies per

Build Alternative for the Alameda Creek Bridge Replacement Project, none of the Build Alternatives will result in a significant contribution to visual/aesthetic cumulative impacts.

The proposed project will result in cumulative impacts to the health of visual/aesthetic resources in Niles Canyon. The Alameda Creek Bridge Replacement Project will account for a short-term decline in the visual/aesthetic quality for a 0.6 miles stretch of the scenic Niles Canyon corridor. Once planting and hydroseeding regrowth occurs, the long-term impacts to the visual/aesthetic quality of the RSA associated with the Alameda Creek Bridge Project will be negligible. No significant contributions to cumulative impacts to visual/aesthetic resources would be contributed from any of the Build Alternatives for the proposed Alameda Creek Bridge Replacement Project.

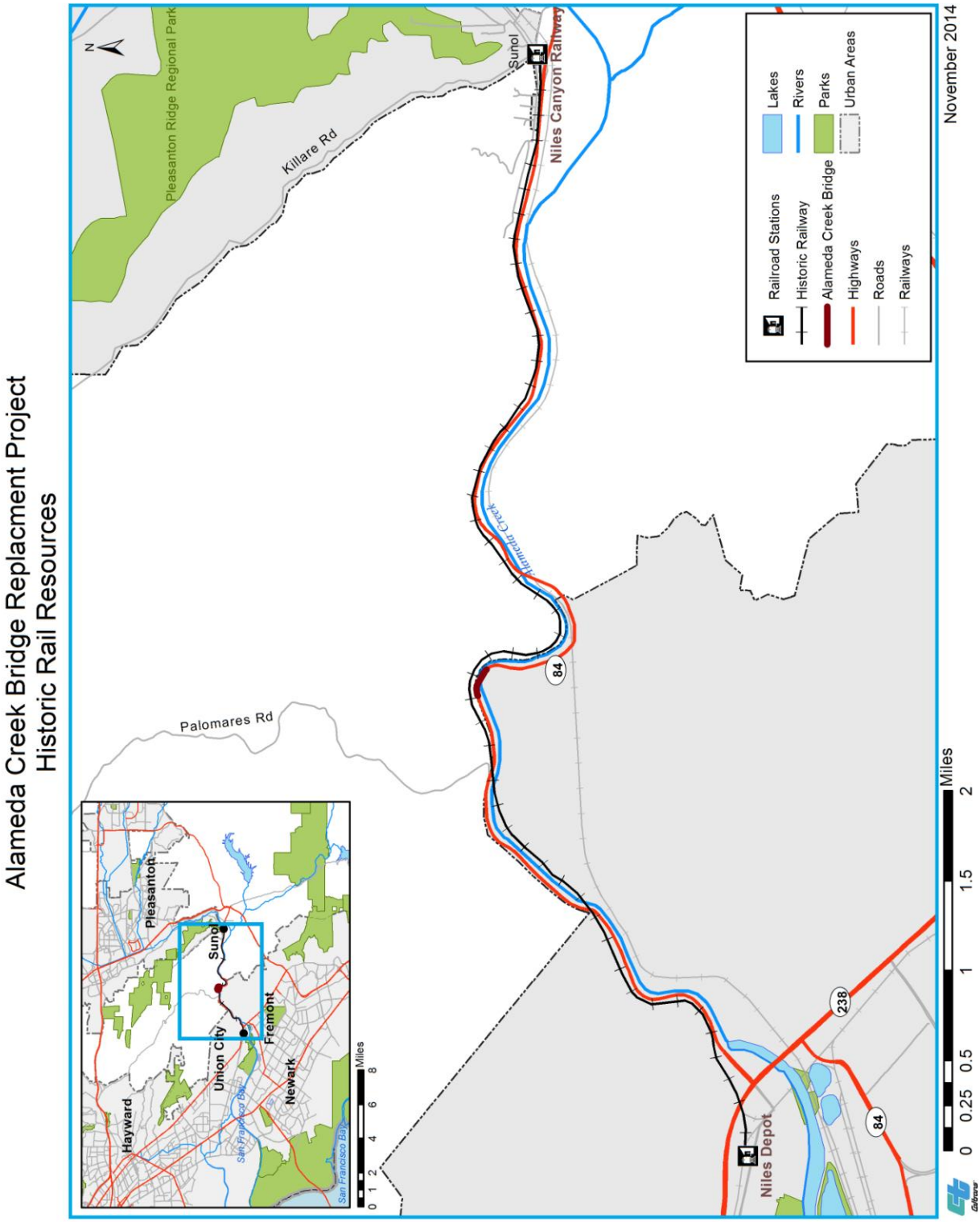
Additionally, it is assumed that the use of the Texas Bridge Railing (C412), a see-through railing that closely matches the existing Alameda Creek Bridge railing reduces the project's contribution to a cumulative impact on the health of the visual/aesthetic resources in the RSA.

2.4.4.2 Cultural Resources (Built/Architectural Resources)

Cultural resources (Built/Architectural Resources) are included in the resources to consider for cumulative impact assessment because all Build Alternatives will result in the demolition of the Alameda Creek Bridge, a local resource that is potentially eligible for inclusion on the Alameda County Register. The RSA for cultural resources (architectural history) was established from the Sunol Train depot to the Niles Train depot. This area was selected as the RSA because all the built resources of the NCTR Historic District, as well as all the built/architectural cultural resources within Niles Canyon proper, are located within these limits. The majority of this area is consistently rural in nature, with rolling/steep hills and vegetation, and has little urban or commercial development visible from the highway. The major cultural resources within this RSA include: the Niles Canyon Railroad, the Sunol Aqueduct and the Sunol Water Temple of Spring Valley Water Company's Alameda Creek System, Vallejo's Aqueduct, the Niles Canyon section of the Union Pacific Railroad, and the Niles Dam turnout structure.

The Alameda Creek Bridge has been determined not eligible for the NRHP (federal) and does not meet the criteria for inclusion in the CRHR (state). However, the Alameda Creek Bridge was identified as a local resource that is potentially eligible for inclusion on the Alameda County Register. Due to the bridge's local designation as a potentially historic resource, Caltrans is considering the bridge to be a historical resource under CEQA and the demolition of the Alameda Creek Bridge is considered to be a significant environmental impact.

Figure 29. Cultural Resources (Architectural History) Resource Study Area



Based on research and historical data and recent trends, the overall health of cultural resources (architectural history) in the RSA is assumed to be stable. Alameda County's Measure D, Save Agriculture and Open Space Lands Initiative, and the City of Fremont's Measure T, also known as the Hill Area Initiative, indirectly protect cultural resources. While both measures protect the scenic quality of the Niles Canyon Corridor and preserve open space, these measures also indirectly protect cultural resources by preventing extensive development in Niles Canyon.

Similar to Measures D and T, the stability of the health of cultural resources within this portion of SR-84 has been indirectly protected by the Scenic Corridor Protection Plan for the Niles Canyon Road and Paloma Way. The Niles Canyon Corridor Protection Program protects the scenic corridor from the encroachment of incompatible land uses, prohibits billboards and regulates on-site signs as to not detract from scenic views, makes development more compatible with the environment, regulates grading to prevent erosion and cause minimal alteration of existing contours, and preserves important vegetative features along the highway. The implementation of the Niles Canyon Corridor Protection Program protects and enhances the scenic resources, and indirectly shields cultural resources in the RSA.

The PLA's decision to preserve, restore, and revive the Niles Canyon Railway strengthened the protection of cultural resources within Niles Canyon. The PLA entered into an agreement with Alameda County and began rebuilding the historic rail line in 1987 (Niles Canyon Railroad, 2014). A year later, the PLA brought railroad passenger operations back to life in Niles Canyon. The Niles Canyon Railway currently provides train rides to the public year-round between Sunol and the Niles community of Fremont (Niles Canyon Railroad, 2014). The successful revival of the Niles Canyon Railroad culminated in the listing of the NCTR Historic District on the NRHP in October 2010. The NCTR Historic District qualifies for protection under Section 106 and indirectly protects other cultural resources in its vicinity.

In the past thirty years, few proposals or projects have resulted in adverse impacts to cultural resources within Niles Canyon. In June of 2000, the City of Fremont issued a permit to demolish the remaining manufacturing facilities of the Mission Clay Factory and a non-operational segment of the Sunol Aqueduct. However, the review of past projects indicate that most have not adversely impacted cultural resources in the RSA (including the Niles Canyon Railroad, the Sunol Aqueduct and the Sunol Water Temple of Spring Valley Water Company's Alameda Creek System, Vallejo's Aqueduct, the Niles Canyon section of the Union Pacific Railroad, and the Niles Dam turnout structure).

All Build Alternatives will result in a substantial adverse change to the Alameda Creek Bridge. All Build Alternatives propose to demolish and replace a bridge considered significant by Alameda County. Other reasonably foreseeable actions that will affect cultural resources (architectural history) include Caltrans' Niles Canyon Safety Improvements Project. The Niles Canyon Safety Improvements Project proposes to replace the bridge railing on the Alameda Creek Bridge and Overhead (Bridge 33-0039, built in 1947). Another Caltrans project includes addressing the scour mitigation at

Arroyo de la Laguna Bridge on SR-84, however, this bridge is not eligible for the NRHP or for the CRHR. Within the cultural resource RSA, the Niles Canyon Safety Improvements Project is the only identified reasonably foreseeable project with the potential to affect cultural resources (architectural history).

This cumulative impact analysis examined the potential for cumulative impacts to historic bridges within the RSA. Five historic bridges are located within the RSA; three are railroad bridges (Dresser Bridge, Silver Springs truss bridge, and Farwell Bridge) and the other two are vehicular bridges (Alameda Creek Bridge and Overhead (Bridge 33-0039) and the Alameda Creek Bridge (Bridge 33-0036)[13]. The Alameda Creek Bridge and Overhead (Bridge 33-0039) is eligible for the NRHP.

The Alameda Creek Bridge (Bridge 33-0036) is not eligible for the NRHP or for the CRHR, but is eligible for the Alameda County Register, and is treated as a historical resource under CEQA. As discussed throughout this document, the Alameda Creek Bridge Replacement Project (Bridge 33-0036) will result in a substantial adverse change to the resource. In addition to the demolition of the Alameda Creek Bridge (Bridge 33-0036), Caltrans is proposing to replace the bridge railing of the Alameda Creek Bridge and Overhead (Bridge 33-0039) in a separate project. Preliminary consultation with the SHPO indicates concurrence with Caltrans' determination that the replacement of the bridge railing will result in "no adverse effect" to the Alameda Creek Bridge and Overhead (Bridge 33-0039). The impacts to two historic vehicular bridges in the RSA indicate a potential for a cumulative impact to vehicular bridges of Niles Canyon. The contribution of the Alameda Creek Bridge Replacement Project (Bridge 33-0036) to the cumulative impact on the historic vehicular bridges is significant given the project will result in a substantial adverse change. This contribution is significant because there are only two historic vehicular bridges located in the RSA and the proposed project will result in a substantial adverse change to one of these two historic bridges. Design considerations such as the use of a see-through bridge railing that suggests the period character of the existing bridge is proposed, but ultimately, the Alameda Creek Bridge Replacement Project (Bridge 33-0036) will result in the demolition of a bridge eligible for the local Alameda County historic register.

For the purpose of this cumulative impact analysis, it is assumed the Texas Bridge Railing (C412), a modified see-through barrier railing that emulates the original architectural design of the 1928 Alameda Creek Bridge, will be approved by Caltrans Headquarters.

2.4.4.3 Water Quality and Stormwater Runoff

Water quality is included in the resources to consider for cumulative impact analysis because the proposed project will require a 401 Water Quality Certification and involves impacts to a 303(d) impaired water. The RSA established for this cumulative impact analysis is defined as the Alameda Creek watershed, an area of roughly 633 square miles

[13] For the purpose of clarification throughout this analysis, the Alameda Creek Bridge and Overhead is identified as Bridge 33-0039 while the Alameda Creek Bridge, the bridge that this project proposes to replace, is identified as Bridge 33-0036.

stretching from Mount Diablo in the north to Mount Hamilton in the south, and east to Altamont Pass. While the discussion of the health and historical context of the resource focuses on the entire Alameda Creek watershed, the identification and review of reasonably foreseeable projects in the area focuses on the Alameda Creek, upstream to its confluence with Calaveras Reservoir and downstream to the San Francisco Bay and its tributaries.

Alameda Creek was listed as a 303(d) impaired water in 1998 for diazinon, a pollutant found in urban runoff and storm sewers (RWQCB, 2014). Although the Alameda Creek is listed as an impaired waterbody, the health of water quality is assumed to stable based on research, historical data, and recent trends. The ACWD continuously samples, analyzes, and monitors the quality of water in Alameda Creek at a special monitoring facility located at the mouth of Niles Canyon near Mission Boulevard and at other key locations throughout the watershed (ACWD, 2014). The ACWD works with property owners and other agencies to encourage proper use of watershed lands to ensure water quality in Alameda Creek is protected and maintained. The Alameda Creek watershed lands include 30,000 acres of primary watershed lands for SFPUC that provides water for 2.4 million customers in the Bay Area (San Francisco Planning Department, 2000). An EIR for the Alameda Watershed Management Plan was certified in August 2000 by the San Francisco Planning Department. This planning document provides a policy framework for SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on watershed lands. The protection of the watershed by Alameda County and the SFPUC indicates stability in the health of the Alameda County watershed.

A review of past projects in the RSA within the last ten years include the Sunol and Niles Dam Removal Project, the Geary Road Bridge Removal Project, the Arroyo de la Laguna Stream Restoration, and the Alameda Creek Pipeline No. 1 Fish Screen and Lago Los Osos Pipeline Project. Of these projects, the Arroyo de la Laguna Stream Restoration and the Alameda Creek Pipeline No. 1 Fish Screen and Lago Los Osos Pipeline Project are stream restoration or fish passage improvement projects with no anticipated adverse impacts to water quality. The Geary Bridge Replacement Project resulted in a less-than-significant impact on water quality (San Francisco Planning Department, 2012) and the Sunol and Niles Dam Removal Project removed a barrier to fish passage. Approximately 40,000 cubic yards of impounded sediment was left in place to move downstream naturally over a period of several decades as a result of the dam removal; impacts to water quality were determined to be less than significant (San Francisco Planning Department, 2005). Projects presently in construction include SFPUC's New Irvington Tunnel Project, which was determined to have a less-than-significant impact to water quality (San Francisco Planning Department, 2009).

While the current health of the Alameda Creek watershed is stable, the watershed has been severely modified from its natural flow regime by occurrences like the construction of the BART weir in Fremont, the Calaveras Dam, the San Antonio, and Del Valle reservoirs (Stanford, et. al., 2013). The operation of these reservoirs and other water conveyance facilities has altered natural flow regimes in streams below the dams and has

impaired water quality. A critical event transforming the Alameda Creek watershed land use was the construction of the Transcontinental Railroad. The construction of a railroad through Niles Canyon in 1869 made it an important regional transportation corridor (Stanford, et. al., 2013). The construction of the railroad through Niles Canyon began attracting new settlers. These new settlers in the Alameda County began modifying the Alameda Creek watershed by developing wells in artesian zones to access the groundwater and direct the path of overflow from Alameda Creek so that sediment would fill low points and deposit over the tidal marsh, converting it to farmland (Stanford, et. al., 2013).

In addition to the Transcontinental Railroad, the water system developed by the Spring Valley Water Company (SVWC) severely altered the Alameda Creek watershed lands. The SVWC provided water from Alameda Creek to the City of San Francisco through canyon channels that transported the water. The SVWC also directed water across gravels so that it would percolate into groundwater aquifers (Stanford, et. al., 2013). In 1888, SVWC began piping Alameda Creek water from Niles to San Francisco (Stanford, et. al., 2013). While severe modifications to the Alameda County watershed occurred as early as the late 1800's, the post World War II era also contributed to large scale changes to the water quality in the area. Population explosions in the cities Livermore, Dublin, Pleasanton, Fremont, Union City, and Newark in 1950s resulted in large scale housing and community developments that further damaged parts of the Alameda Creek watershed and impaired water quality (Stanford, et. al., 2013).

The Alameda Creek Bridge Replacement project proposes to divert Alameda Creek from June 1 to October 15 for the necessary construction seasons. Additionally, Caltrans proposes to remove the remnant bridge footings and concrete wall (weir) located upstream of the existing Alameda Creek bridge. These old footings act as a weir on the Alameda Creek and create a barrier to fish passage. Caltrans proposes to remove the bridge footings (weir) as a mitigation strategy for CDFW's 1602 streambed impacts, CWA 404 and 401 impacts, and federally endangered steelhead – California Central Coast DPS.

All Build Alternatives of the Alameda Creek Bridge Replacement Project will temporarily impact water quality within the immediate project limits of Alameda Creek. The installation and removal of stream diversion elements will result in the temporary discharge of sediment and a temporary increase in-stream turbidity. Impacts to water quality associated with the installation and removal of stream diversion will be short term and temporary occurrences that will not adversely impact Alameda Creek's water quality. The proposed removal of the weir will have some temporary impacts associated with sediment dispersal through Alameda Creek. However, the long term impacts of the weir's removal will promote beneficial uses of Alameda Creek by ensuring full fish passage through the project site, restoring the Alameda Creek to a more natural condition, and eliminating the backwater effect created by the weir. Appropriate avoidance, minimization, and mitigation measures will be implemented to ensure no adverse impacts to water quality as a result of the weir removal.

Future projects identified in the RSA include the Arroyo de la Laguna Bridge Project, I-680 HOV Lanes Project, ACWD-ACFCD Joint Lower Alameda Creek Fish Passage Improvements, the Kaiser Fish Screen Project, Old Canyon Road Bridge Foundation Protection Repair Project, Ward Creek Flood Control Project (Floodwall Improvements Along Zone 3A Line D: Phase 2, Between Huntwood Avenue and Bart, Hayward, California), Appian Tank Seismic Upgrade Project, Vallecitos Channel Repair, and Stonybrook Creek Fish Passage Improvement Project. Many of these projects involve fish passage improvements or improving Alameda County flood control facilities. Some of these projects will temporarily impact water quality, however, no adverse long-term impacts to water quality are expected through the implementation of specific project avoidance and minimization measures.

The proposed Alameda Creek Bridge Replacement Project will result in the implementation of seasonal creek diversion as well as increasing the paved surface in the project area. Although all Build Alternatives would result in an increase in paved surface in the project area, the stormwater treatment system, either a biorention system or biostrips, selected during the design phase of the project would address both water treatment and hydromodification requirements. Additionally, the removal of the concrete weir located upstream of the Alameda Creek Bridge is proposed to serve as compensatory mitigation for federal ESA consultation and the following permits: CDFW 1602 and CWA 401 and 404. All Build Alternatives of the Alameda Creek Bridge Replacement Project will temporarily impact water quality and contribute some sedimentation dispersal and increased turbidity within the immediate project limits of Alameda Creek. However, with the implementation of water quality avoidance, minimization and mitigation measures and the stormwater system (to be selected during the project's design phase), no long-term adverse impacts to water quality are expected.

Some future projects in the RSA that will temporarily impact Alameda Creek watershed water quality, but will not degrade or result in a decline in the health of Alameda Creek watershed. Although the proposed Alameda Creek Bridge will result in some sedimentation dispersal and increased turbidity, these impacts are relatively minor in comparison to the annual sediment load of Alameda Creek and would not affect the stability of the health of the resource.

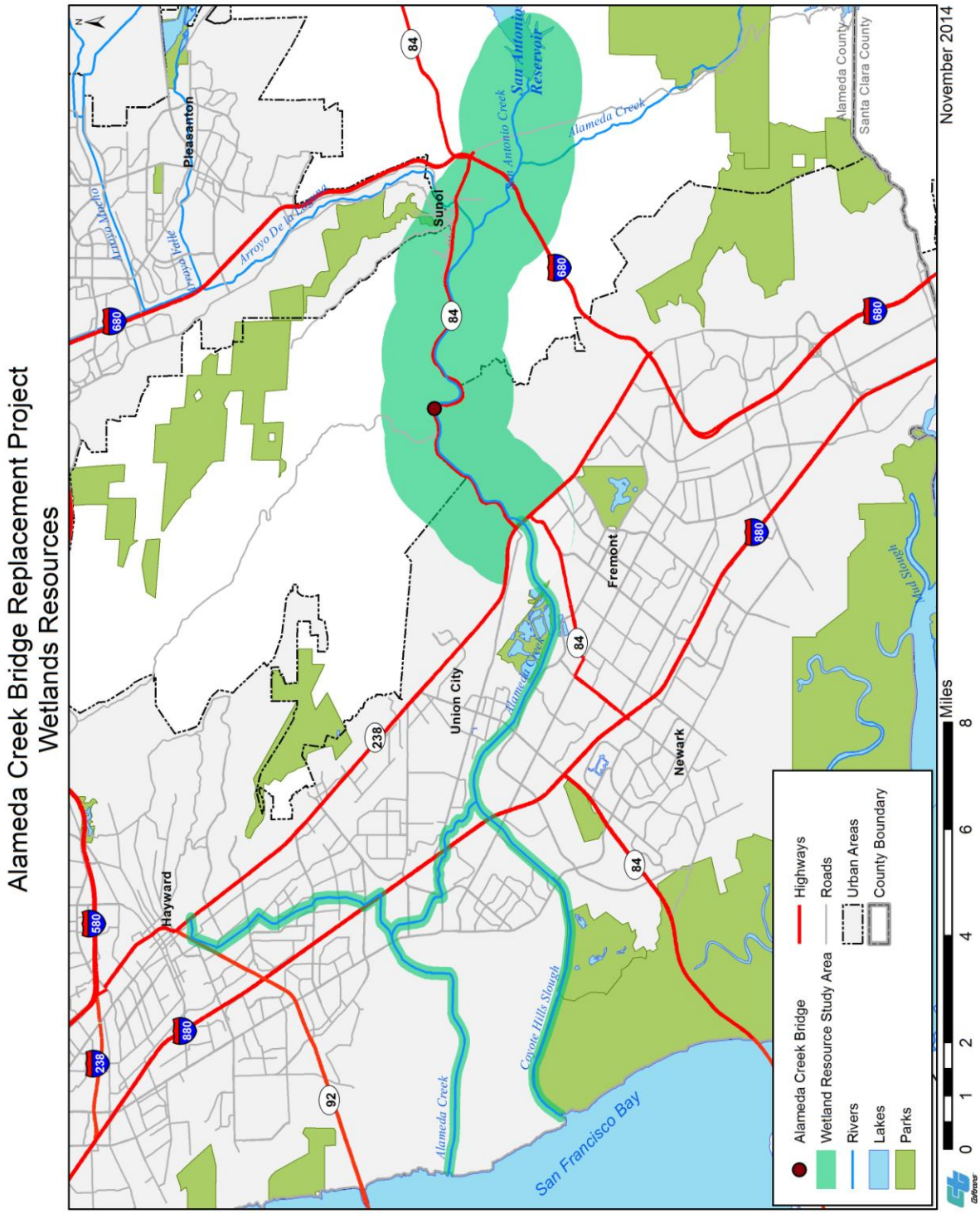
The results of this analysis indicate the proposed project, in combination with past, present, and future actions, would not affect the health of resource and ultimately, there is no cumulative impact to water quality. The Alameda Creek Bridge Replacement Project, including the proposed weir removal, will result in some sediment dispersal and increased turbidity, however, these impacts are short term and will not result in cumulative impact to the health of water quality in combination with reasonably foreseeable actions.

The Alameda Creek Bridge Replacement Project will not result in an adverse contribution to cumulative impacts to water quality. No additional mitigation measures are proposed besides those listed in Section 2.2.1 Hydrology/Floodplains and Section 2.2.2 Water Quality and Stormwater Runoff.

2.4.4.4 Biological Environment: Wetlands and Other Waters

The Alameda Creek Bridge Replacement Project will impact a 303 (d) listed water body and require CWA 404 and 401 permits. As a result, impacts to wetlands and other waters will be considered as part of this project's cumulative impact analysis. The RSA of jurisdictional wetlands and other waters analysis includes Alameda Creek upstream to its confluence with Calaveras Reservoir and downstream to the San Francisco Bay and its tributaries.

Figure 30. Wetlands and Other Waters Resource Study Area



Based on research, historical data, and recent trends, the overall health of the resource is assumed to be stable. The ownership of watershed lands by Alameda County and the SFPUC directly protect the land from development and indirectly protect wetlands and other waters located within their jurisdiction. In addition to the ownership by public agencies, the passage of Alameda County's Measure D, Save Agriculture and Open Space Lands Initiative, and the City of Fremont's Measure T also indirectly protect and contribute to the stability of wetland and other waters health within the RSA. While aiming to protect the scenic quality of the Niles Canyon Corridor and preserve open space, these measures indirectly protect wetlands by preventing development in Niles Canyon.

A review of past projects from the past ten years in the RSA include the Sunol and Niles Dam Removal Project, the Geary Road Bridge Removal Project, the Arroyo de la Laguna Stream Restoration, and ACWD's Alameda Creek Pipeline No. 1 Fish Screen and Lago Los Osos Pipeline Project. Of these projects, the Arroyo de la Laguna Stream Restoration and the Alameda Creek Pipeline No. 1 Fish Screen and Lago Los Osos Pipeline Project are stream restoration or fish passage improvement projects with no anticipated adverse or permanent impacts to wetlands through the implementation of avoidance and minimization measures. The Geary Bridge Replacement Project resulted in 0.01 acre of permanent impacts to wetlands and 0.5 acre of temporary impacts to permanent features (San Francisco Planning Department, 2012). The Sunol and Niles Dam Removal projects removed a barrier to fish passage; approximately 40,000 cubic yards of impounded sediment was left in place to move downstream naturally over a period of several decades (San Francisco Planning Department, 2005). This project resulted in 0.5 acres of permanent impacts to wetlands and other waters. Projects presently in construction include SFPUC's New Irvington Tunnel Project, which involves 0.02 acres of permanent impacts to wetlands and 0.33 temporary impacts to wetlands (San Francisco Planning Department, 2009).

The Alameda Creek Bridge Replacement Project will result in permanent and temporary impacts to wetlands and other waters. Permanent and temporary impacts to wetlands and other waters of the United States vary per Build Alternative and displayed in Table 15 in Section 2.3.2.

Implementation of the project will result in the removal of existing bridge footings from the creek channel, the removal of the upstream concrete weir, and the removal of invasive giant reed populations. This will beneficially impact Alameda Creek by allowing the stream to take on a more natural morphology and facilitating the development of linear in-stream wetlands along the banks.

Future projects identified in the RSA include the Arroyo de la Laguna Bridge Project, I-680 HOV Lanes Project, the Kaiser Fish Screen Project, the ACWD-ACFCD Joint Lower Alameda Creek Fish passage improvements, Old Canyon Road Bridge Foundation Protection Repair Project, Ward Creek Flood Control Project (Floodwall Improvements Along Zone 3A Line D: Phase 2, Between Huntwood Avenue and Bart, Hayward, California), Appian Tank Seismic Upgrade Project, Vallecitos Channel Repair, and

Stonybrook Creek Fish Passage Improvement Project. Many of these projects involve fish passage improvements or improving Alameda County flood control facilities; avoidance and minimization measures to avoid impacts to jurisdictional wetlands or waters are included in the environmental documents for many of these projects.

The following table summarizes potential impacts to wetlands and other waters in the RSA as a result of past, present, and future projects:

Table 26. Impacts to wetlands and other waters in the RSA

Project Proponent	Project	Project status	Temporary Impacts to wetlands and other waters	Permanent Impacts to wetlands and other waters	Total Impacts to wetlands and other waters
Caltrans	Alameda Creek Bridge Replacement Project	In environmental phase	Between 1.1 acres to 1.3 acres*.	Between 0.002 acres to 0.2 acres*.	Between 1.1 acres to 1.5 acres*.
Caltrans	Arroyo de la Laguna	In planning phase	Unknown	Unknown	Unknown
Caltrans	Interstate 680 HOV Lanes Project	In environmental phase	0.2 acres	0.1 acres	0.26 acres
SFPUC	Geary Bridge Replacement Project	Currently in construction	0.5 acre	0.01 acre	0.51 acres
SFPUC	Sunol and Niles Dam Removal	Construction completed.	Unknown	0.5 acres	0.5 acres and temporary impacts
SFPUC	New Irvington Tunnel Project	Currently in construction	0.3 acres	0.02 acre	0.4 acres
Total Impacts			**Between 2.2 acres to 2.3 acres.**	**Between 0.5 acres to 0.8 acres**	**Between 2.8 acres to 3.1 acres**

* Varies by Build Alternative

Wetlands located in permanent impact areas are likely to be lost during project activities. Wetlands located in temporary impact areas would all be restored post-construction. Compensatory mitigation at a minimum one-to-one ratio is required by the Army Corp of Engineers for all permanent impacts; as a result, this analysis will focus on permanent

impacts to wetlands to quantify the potential cumulative impacts of the Alameda Creek Bridge on wetlands in the RSA.

Build Alternatives 1 and 3B will result in .002 acres of permanent impacts to wetlands and other waters, Build Alternative 2 will result in 0.171 acres of permanent impacts to wetlands and other waters, and Build Alternative 3A will result in 0.1 acres of impacts to wetlands and other waters. Out of the past, present, and reasonably foreseeable projects, Build Alternative 2 (the alternative with the largest amount of permanent wetland impacts) would account for less than 25% of all permanent wetland impacts in the RSA while Build Alternatives 1 and 3B (the alternatives with the least amount of permanent wetland impacts) would account for less than 1% of all permanent wetland impacts in the RSA. These permanent wetland impacts from the Alameda Creek Bridge Replacement Project will be cumulatively minor; additionally the implementation of the project will result in the removal of existing bridge footings from the creek channel, the removal of the upstream concrete weir, and the removal of invasive giant reed populations. This will beneficially impact Alameda Creek by allowing the stream to take on a more natural morphology and facilitating the development of linear in-stream wetlands along the banks. The Alameda Creek Bridge Replacement Project will not result in a significant contribution the decline of the health of the resource in the RSA.

Furthermore, the results of this analysis indicate that there is no trend in the decline of the health of the resource as a result of past and present projects and that there will be no future decline in the health of the wetlands in the RSA as a result of reasonably foreseeable projects. Therefore, there is no cumulative impact to wetlands within the RSA nor will the Alameda Creek Bridge Replacement Project make a significant contribution to potential cumulative impacts which would degrade the quality of wetlands and other waters in the RSA.

The Alameda Creek Bridge Replacement Project will not result in a cumulative impact to wetlands. No additional mitigation measures are proposed besides those listed in Section 2.3.2.

2.4.4.5 Biological Environment: Natural Communities

The project will impact oak woodlands, riparian habitat, and other trees on approximately 0.6 miles of SR-84 from postmile 13.0 to postmile 13.6. This cumulative impact analysis specifically focuses on the scale of tree removal as a result of the proposed Alameda Creek Bridge Replacement Project. The RSA for the cumulative effect analysis for trees includes the Niles Canyon corridor, SR-84 from Mission Boulevard (SR-128) to just west of the town of Sunol. The RSA was chosen because these limits define one continuous corridor for oak woodland and riparian habitat.

Based on research, historical data, and recent trends, the health of this resource is assumed to be stable due to the surrounding lands being officially designated watershed lands and owned by public resource agencies. Additionally, the passage of Alameda County's Measure D and the City of Fremont's Measure T protect the scenic quality of

the Niles Canyon Corridor and preserve open space. These measures indirectly protect trees by preventing development in Niles Canyon.

In 2011, Caltrans' removed 150 native trees on SR-84 between postmiles 12.1 to 13.3 in preparation for the now-defunct Niles 1 Project. Although Caltrans terminated the project, the decline in the health of the resource still exists as Caltrans has yet to provide mitigation for these trees. A review of past projects in the RSA indicated trees were also removed as a result of the Sunol and Niles Dam Removal, but avoidance, minimization, and mitigation measures for the project included replacement of all trees at a minimum of 1.1:1. Overall, the health of trees in the RSA is assumed to be stable with a minor decline over the past three years stemming from Caltrans' Niles 1 Project and the lack of mitigation for this project's impact to trees.

All Build Alternatives will involve a loss of trees in the RSA. Build Alternative 1 will result in temporary and permanent impacts to 415 trees, Build Alternative 2 will result in temporary and permanent impacts to 324 trees, Build Alternative 3A will result in temporary and permanent impacts to 353 trees, and Alternative 3B will result in temporary and permanent impacts to 284 trees. Trees located in permanent impact areas are likely to be removed during project activities. Some trees located in temporary impact areas may be preserved depending on the specific activity occurring near them. To be conservative, Caltrans is accounting for removal of trees in temporary impact areas. During construction, Caltrans will make an effort to reduce impacts to trees in temporary impact areas to the greatest extent possible. For the purpose of cumulative impact analysis, Caltrans will use the summation of both temporary and permanent impacts for calculating the project's impact to trees. The impacts to native trees in the project study area vary by Build Alternative, as identified in Tables 24 and 25 in Section 2.4.4.1.

Two reasonable and foreseeable projects within the RSA have been identified as projects with the potential to impact trees. These two projects are Caltrans' Niles Canyon Safety Improvements Project and Caltrans' Arroyo de la Laguna Bridge Project. The Arroyo de la Laguna Bridge Project is currently in the early planning phase and impacts to trees and mitigation associated with the project have not yet been determined. Preliminary estimates indicate some tree and shrub removal will occur within the Arroyo de la Laguna Bridge Project project limits. The Niles Canyon Safety Improvements Project will require tree removal in Niles Canyon, however, the exact number of trees has not been determined yet as the project is still in environmental phase. Project-specific effects to trees and the associated mitigation will be documented in its own biological study, estimated to be completed in early 2015. Preliminary estimates indicate that less than 100 trees will be removed as part of this project; 100 trees will be used as the consideration for the purpose of this cumulative impact analysis.

Oak woodland and riparian habitat serve important functions in the ecosystem by preventing erosion and providing habitat, shade, and cover to wildlife. The removal of incremental amounts of trees by various past, present, and future projects could potentially change habitat types in Niles Canyon and result in a conversion to ruderal or

grassland habitat. The following table summarizes potential impacts to trees in the RSA as a result of past, present, and future projects:

Table 27. Impacts to trees in the RSA

Proponent	Project	Project status	Impacts to trees
Caltrans	Alameda Creek Bridge Replacement Project	In environmental phase	Between 285-415 trees* *Varies by Build Alternative
Caltrans	Niles Safety Improvements Project	In environmental phase; draft environmental document expected in 2015	100 trees
Caltrans	Niles 1 Project	Project terminated	150 trees
Caltrans	Arroyo de la Laguna Bridge Project	In planning phase	Unknown
SFPUC	Sunol and Niles Dam Removal Project	Complete	Impacted tree numbers not quantified in Sunol and Niles Dam Removal EIR, but trees were replaced at a 1.1:1 ratio and will be monitored for a minimum five year period.
TOTAL			**550-650 trees**

The results of the analysis indicate that Alameda Creek Bridge Replacement Project, in combination with past, present, and reasonably foreseeable action, have the potential to contribute to cumulative impacts on trees in the Niles Canyon corridor.

As identified in Section 2.3.1, Caltrans will provide tree replacement on-site at a 1:1 ratio in the existing SR-84 alignment for upland trees. Depending on the Build Alternative selected and the number of upland trees able to be planted on-site, there may be a need for off-site mitigation planting (at a location to be determined). Mitigation for trees removed from the riparian zone will be mitigated at a 3:1 ratio and will be replanted within the Alameda Creek watershed, with as many riparian mitigation trees planted on-site as possible. Depending on the Build Alternative selected and the number of riparian trees able to be planted on-site, there may be a need for off-site mitigation planting. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements.

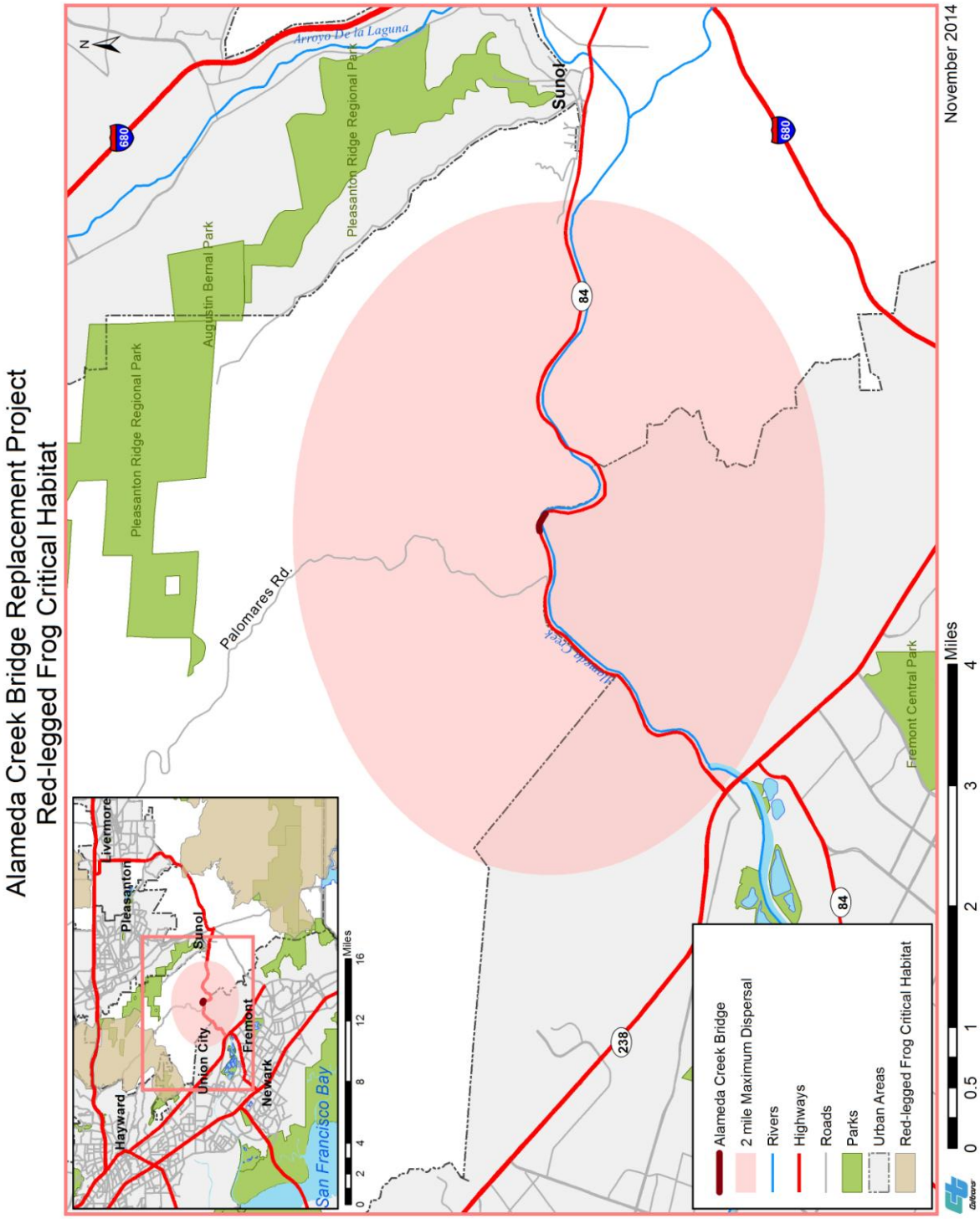
The result of this analysis indicate that, although the Alameda Creek Bridge Replacement Project would result in the loss of trees, the implementation of project specific mitigation efforts would ensure trees are replanted within the project area and Alameda Creek watershed, to the maximum extent possible. This would reduce the project's contribution to cumulative impacts on the health of trees in Niles Canyon. Furthermore, although 550-650 trees will be removed from the RSA as a result of past, present, and reasonably foreseeable actions, there is no indication that the overall health of the trees within the Niles Canyon corridor is currently in decline or anticipated to decline. The land use protections of the Niles Canyon corridor and the corridor's establishment as watershed lands insulate the canyon from development and indirectly protect trees.

Although the Alameda Creek Bridge Replacement Project would result in the removal of trees within the RSA, there is no general decline in the health of the resource in the RSA. No additional mitigation measures are proposed besides those listed in Section 2.3.1.

2.4.4.6 Biological Environment: California Red-legged frog

The CRLF is identified as a resource to consider for cumulative impact analysis because the Alameda Creek Bridge Replacement Project will require a Biological Opinion from USFWS for project impacts to this federally threatened species. The RSA for CRLF is defined by the maximum dispersal distance of individual (two miles) around the project limits (USFWS, 2002).

Figure 31. California Red-Legged Frog Resource Study Area



Based on research, historical data, and recent trends, the health of the species' within the RSA is assumed to be stable since the listing of the CRLF in 1996. Although historic urban development, particularly road and highway construction, has fragmented CRLF and made them more vulnerable to decline, habitat within the RSA has remained mostly intact and undeveloped. The land use in Niles Canyon is predominately owned by public resource agencies and delineated as watershed lands. The passage of Alameda County's Measure D and the City of Fremont's Measure T indirectly help to protect CRLF habitat within the RSA. Both measures aim to protect agricultural and open space and protect overdevelopment in the surrounding Fremont Hills and Niles Canyon Corridor. With land use planning designations insulating the majority of the RSA from development, the health of California red-legged frog was determined to be stable.

A review of past projects occurring in the last ten years within the RSA indicated the Sunol and Niles Dam Removal Project was the only project with impacts to CRLF. Impacts to CRLF were mitigated through restoration of all temporarily disturbed areas (San Francisco Planning Department, 2005). In a longer-range historical context, while much of Alameda County was rapidly developing and urbanizing during the 1950s and 1960s, the land use in the RSA remained mostly intact and undeveloped due to the ownership of surrounding lands by public resource agencies and the area's delineation as watershed lands.

The proposed Alameda Creek Bridge Replacement Project will impact CRLF habitat in the project limits. Indirect impacts may result from temporary habitat exclusion and degradation during periods of construction activities. Impacts to habitat from the proposed project will be off-set through on-site restoration and enhancement, as well as providing compensatory mitigation by purchasing off-site credits at a conservation bank. The impacts to CRLF by each Build Alternative are identified in Table 17 in Section 2.3.5.

Although the project will have impacts to CRLF habitat, the potential long-term impacts to CRLF habitat are expected to be beneficial. Implementing the project will result in the removal of existing Alameda Creek Bridge footings from the creek channel, the removal of the upstream concrete weir, and the removal of invasive giant reed populations. This will allow the stream to take on a more natural morphology and facilitate the development of linear in-stream wetlands along the banks. Caltrans does not anticipate the project will increase barriers to wildlife movement or cause increased roadside mortality.

Several reasonably foreseeable actions will occur within the RSA. These include the Niles Canyon Safety Improvements Project, the Stonybrook Fish Passage Improvement Project, and the Old Canyon Bridge Replacement Project. The Stonybrook Fish passage Improvement Project and the Old Canyon Bridge Replacement Project both identify measures that avoid and minimize impacts to CRLF habitat. The Niles Canyon Safety Improvements Project is the only reasonably foreseeable project in the RSA that will provide compensatory mitigation through permitting requirements for impacts to CRLF; other projects will avoid impacts to CRLF through the implementation of project

avoidance and minimization measures. Specific impacts have not yet been determined as the Niles Canyon Safety Improvements Project is still in the environmental phase. Project-specific effects to the CRLF and the associated compensatory mitigation will be documented in the draft environmental document, anticipated for release to the public in 2015.

The results of this analysis indicate there is no cumulative impact to the health of CRLF in the RSA as a result of past, present, and future actions and that the Alameda Creek Bridge Replacement Project will not contribute to the degradation or decline in the health of the species. The Sunol and Niles Dam Removal Project was the only past project identified within the RSA that resulted in impacts to CRLF habitat; impacts for this project were mitigated by restoring temporarily disturbed areas in the project area. Additionally, the only reasonably foreseeable project within the RSA is the Niles Canyon Safety Improvements Project indicating that the health of CRLF habitat will not be degraded by future actions and projects. The amount and quality of habitat being impacted by the Alameda Creek Bridge Replacement Project will be mitigated through a combination of on-site enhancements and restoration, and off-site compensation. Impacts from the Alameda Creek Bridge Replacement Project will not affect the persistence of local populations of CRLF in the Alameda Creek watershed. Ultimately, the project is expected to have a beneficial effect on the Alameda Creek and riparian habitat with the removal of existing bridge footings from the creek channel, the removal of upstream concrete weir, and removal of invasive giant reed populations. These elements will allow the stream to take on a more natural morphology and facilitate the development of linear in-stream wetlands along the banks, which will enhance CRLF habitat. Caltrans does not anticipate any cumulative effects to CRLF as a result of the proposed project.

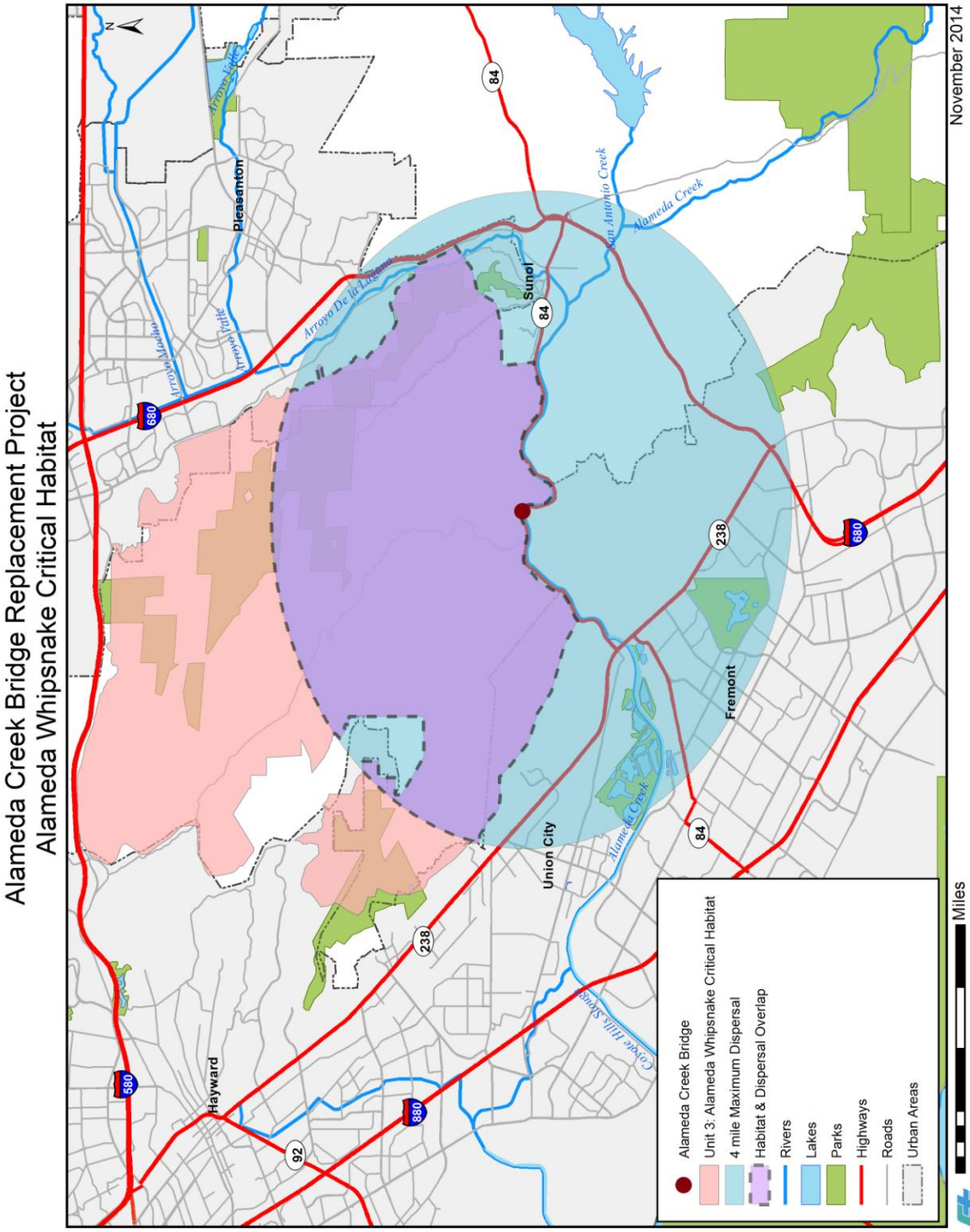
The results of the analysis indicate that there is no cumulative impact to CRLF within the RSA, given the lack of past and future projects that have or will occur in the RSA that may result in a decline in the health of resource. Additionally, the proposed Alameda Creek Bridge Replacement project is anticipated to have a beneficial impact on the Alameda Creek contributing to the stability of the health of the CRLF within the RSA.

The Alameda Creek Bridge Replacement Project will not result in a cumulative impact to CRLF or its habitat. No additional measures are proposed besides those listed in Section 2.3.5.4.

2.4.4.7 Biological Environment: Alameda Whipsnake

AWS is identified as a resource to consider in cumulative impact analysis because the Alameda Creek Bridge Replacement Project would impact AWS Critical Habitat Unit 3 and would require an ITP from the CDFW. Additionally, impacts to AWS are considered in cumulative impact analysis because prior to their listing in 1997, AWS populations within the region declined from the loss of habitat as a result of urban expansion and development (USFWS, 2011). The RSA for AWS extends four miles in all directions from the limits of the project limits. A four-mile buffer from all limits of the project limits was selected as the RSA because four miles is defined as the maximum dispersal distance of AWS individuals from scrub habitat per USFWS (USFWS, 2011).

Figure 32. Alameda Whipsnake Resource Study Area



Based on research, historical data, and recent trends, the health of the species' in the RSA is assumed to be stable since the AWS listing in 1997. The passage of Alameda County's citizen sponsored ballot initiative Measure D, Save Agriculture and Open Space Lands Initiative, in November 2000, and the city of Fremont's Measure T, also known as the Hill Area Initiative, passed in 2002, help protect AWS habitat within the RSA. Both Alameda County's Save Agriculture and Open Space Lands Initiative and the City of Fremont's Hill Area Initiative aim to protect agricultural and open space and protect overdevelopment in the surrounding Fremont Hills and Niles Canyon Corridor. Although historic urban development, particularly road and highway construction, has fragmented AWS populations and made them more vulnerable to decline, habitat within the RSA has remained mostly intact and undeveloped given the ownership of the surrounding lands by public resource agencies and the area's delineation as watershed land. With land use planning designations insulating the majority of the RSA from development, the health of AWS was determined to be stable. The designation of AWS Critical Habitat Unit 3 in southern Alameda County in 2006 further contributed to the stability of the resource.

In a longer range historical context, while much of Alameda County was rapidly developing and urbanizing during the 1950s and 1960s, the land use in the RSA remained mostly intact and undeveloped due to the ownership of surrounding lands by public resource agencies and the area's delineation as watershed lands.

Various projects including the Caltrans' Niles 1 Project (terminated in 2011), Alameda County Resource Conservation District's Arroyo de la Laguna Stream restoration, Alameda County Water District's Alameda Creek Pipeline No. 1 Fish Screen and Lago Los Osos Pipeline Project, and SFPUC's Sunol and Niles Dam Removal have all occurred within the RSA established for AWS. Avoidance and minimization measures were implemented as part of each project to avoid impacts to AWS habitat or no impacts to AWS habitat occurred as a result of each project. As previously mentioned, the USFWS designated AWS Critical Habitat Unit 3 in southern Alameda County in 2006. No impacts to AWS Critical Habitat Unit 3 in the RSA have occurred in the past eight years using 2006 as the baseline year for reviewing past projects. Current projects in construction in the RSA include SFPUC's New Irvington Tunnel project, which involves the construction of an eight-foot-in-diameter tunnel to transmit water between the Sunol Valley and Fremont. Construction of the 3.5-mile-long project involves approximately 73.9 acres of impacts to whipsnake habitat; of these 73.9 acres, 71.1 acres are temporary impacts and 2.8 acres are permanent impacts (San Francisco Planning Department, 2009). Permanent impacts are areas where new facilities are constructed that result in a permanent loss of sensitive biological resources. No impacts to Critical Habitat Unit 3 for AWS are anticipated as a result of SFPUC's New Irvington Tunnel Project (San Francisco Planning Department, 2009).

The proposed Alameda Creek Bridge Replacement Project would impact AWS habitat within the project limits. Indirect impacts may result from temporary habitat exclusion and degradation during periods of construction activities. Impacts to habitat from the proposed project would be off-set through some on-site restoration and enhancement, as well as providing compensatory mitigation by purchasing off-site credits at a mitigation

bank. The impacts to AWS by each Build Alternative are identified in Table 17 in Section 2.3.5.

The proposed project would also impact AWS Critical Habitat Unit 3, identified in Table 18 in Section 2.3.5.

Several reasonably foreseeable actions will occur within the RSA. Caltrans is the project proponent for the following reasonably foreseeable actions: the Arroyo de la Laguna Bridge Project, Niles Canyon Safety Improvements Project, I-680 HOV/Express Lane Project, and the 680 Freeway Performance Initiative in Alameda County.

- The Arroyo de la Laguna Bridge Project is currently in the early planning phase and impacts to AWS habitat and mitigation associated with the project have not yet been determined. The project will involve impacts to Alameda whipsnake habitat but will not impact any AWS Critical Habitat Unit 3 as the project area is outside of critical habitat limits.
- Impacts to AWS habitat from the Niles Canyon Safety Improvements Project is preliminarily estimated at 13.5 acres (this preliminary estimate combines both permanent and temporary impacts). According to preliminary estimates, the project will impact approximately one-acre of Alameda whipsnake Critical Habitat Unit 3.
- Impacts to AWS habitat from the I-680 HOV Lanes Project is estimated at 18.98 acres (11.7 acres were identified as permanent impacts and 7.3 acres were identified as temporary impacts). The project involves no impacts to AWS Critical Habitat Unit 3.
- Impacts to AWS habitat from the Freeway Performance Initiative on I-680 is estimated at 9.9 acres (3.1 acres were identified as permanent impacts and 6.8 acres were identified as temporary impacts).The project involves no impacts to AWS Critical Habitat

All Build Alternatives would have temporary and permanent impacts to AWS habitat, however, this cumulative impact analysis will focus on impacts to AWS Critical Habitat Unit 3. This analysis will focus on the Alameda Creek Bridge Replacement Project and past, present, and future project impacts to AWS Critical Habitat Unit 3 in the RSA because Critical Habitat Unit 3 is a federally designated area that contains features essential to the AWS conservation. All Build Alternatives would have direct impacts to AWS Critical Habitat Unit 3 with Build Alternative 2 resulting in the least amount of impacts. Under Build Alternative 1, the total project related impacts to critical habitat is 2.0 acres, under Build Alternative 2, the total project related impacts to critical habitat is 1.2 acres, under Build Alternative 3A, the total project related impacts to critical habitat is 1.4 acres, and under Build Alternative 3B, the total project related impacts to critical habitat is 1.4 acres. Total project related impacts to Critical Habitat Unit 3 using Build Alternative 1 (the alternative with the greatest impacts) is less than one hundredth of a percent of the total area (~26,000 acres) of Critical Habitat Unit 3 for AWS.

In addition to the Alameda Creek Bridge Replacement Project, four projects are identified as reasonably foreseeable within the RSA. All of these projects would have

impacts to AWS habitat, but only one project, the Niles Canyon Safety Improvements Project would involve impacts to Critical Habitat Unit 3 for AWS. Preliminary estimates indicate that less than one acre of Critical Habitat Unit 3 would be impacted by the Niles Canyon Safety Improvements Project.

The Alameda Creek Bridge Replacement would impact less than one hundredth of a percent of the total 26,000 acres of Critical Habitat Unit 3 for AWS. Furthermore, Caltrans anticipates a net beneficial effect to Niles Canyon riparian habitat due to removal and enhancement of the old roadway alignment. Due to the nominal disturbance to critical habitat within the proposed project construction area and an overall beneficial improvement, Caltrans does not anticipate an adverse modification to critical habitat for AWS. Only one reasonably foreseeable project within the RSA would impact AWS Critical Habitat – Unit 3. Impacts from the Niles Canyon Safety Improvements Project are also estimated to impact less than one hundredth of a percent of the total 26,000 acres of Critical Habitat Unit 3 for AWS.

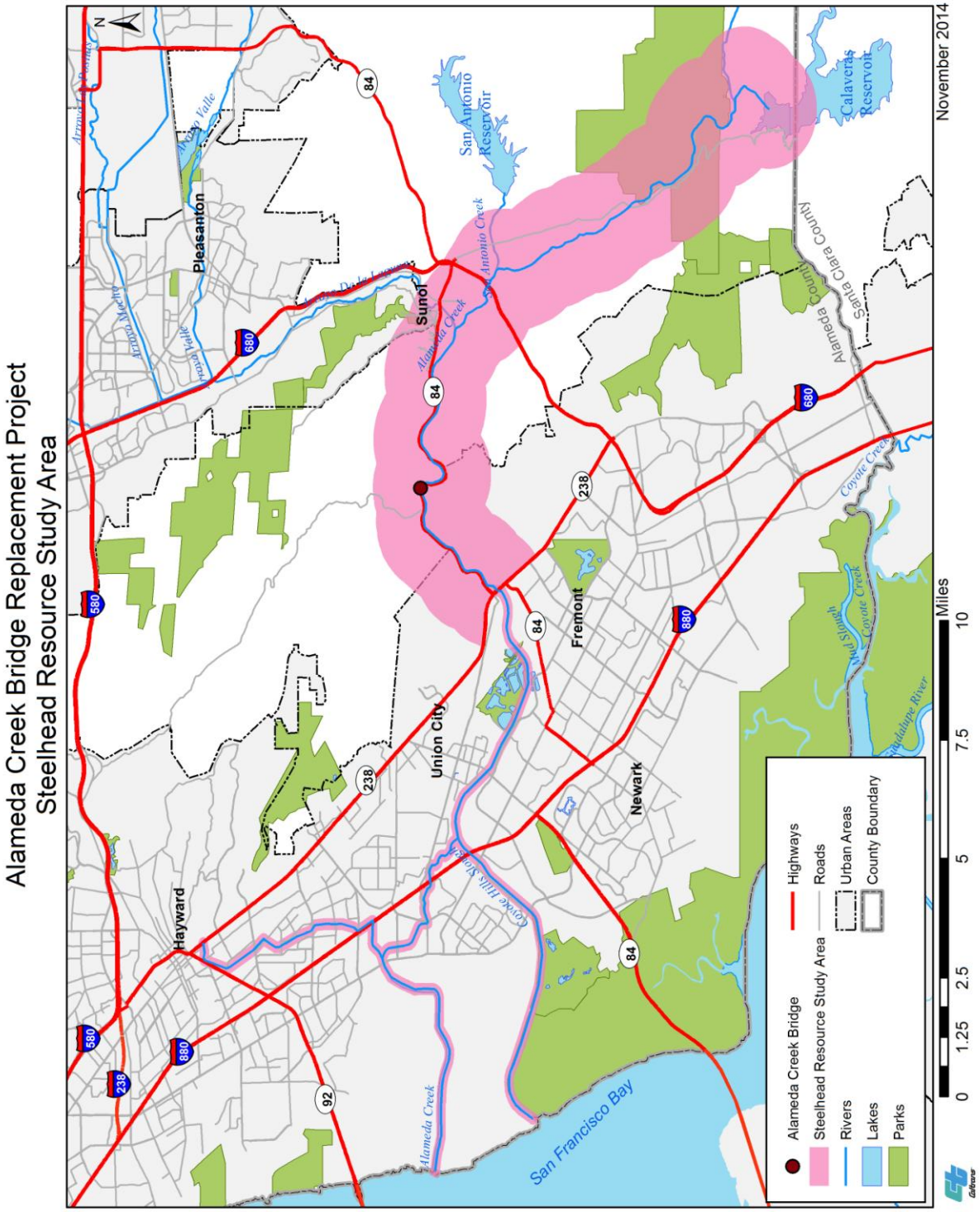
The results of the analysis indicate that All Build Alternatives for the Alameda Creek Bridge Replacement Project would impact less than one hundredth of a percent of AWS Critical Habitat Unit 3. The stable health of the species within the RSA in the context of past historical data, as well as reasonably foreseeable actions, indicate that the project would not affect the health of the resource.

The Alameda Creek Bridge Replacement Project would not result in a significant contribution to cumulative impacts to the AWS or its habitat. No additional mitigation measures are proposed besides those listed in Section 2.3.5.4.

2.4.4.8 Biological Environment: Steelhead Central California Coast DPS

The proposed project will have impacts on steelhead - Central California DPS Steelhead habitat. Over the past several decades, steelhead species in Alameda Creek have been in decline, however, recent fish passage improvement projects indicate an effort to restore the species in their historic Alameda Creek habitat. Impacts to steelhead habitat will be considered as part of the Alameda Creek Bridge Replacement Project's cumulative impact analysis because of the project's impacts to the species' habitat as well as the history of steelhead decline in Alameda Creek. The RSA selected for steelhead cumulative impact analysis includes CDFW's steelhead distribution layer within Alameda Creek and its tributaries, along with a one mile buffer (for upper Alameda Creek) and a 1/10 mile buffer (for urbanized areas in lower Alameda Creek) (CDFW, 2012).

Figure 33. Steelhead – Central California Coast DPS Resource Study Area



Based on research, historical data, and recent trends, the health of the steelhead Central California DPS is assumed to be improving. Within the last 10 years, several projects have been implemented to restore fish passage through Alameda Creek to the San Francisco Bay. These past and present projects include the SFPUC's Sunol and Niles Dam Removal Project and ACWD's Alameda Creek Pipeline Number 1 Fish Screen and Lago Los Osos Pipeline Project. Additionally, Alameda Creek Alliance's involvement and advocacy work to remove barriers to fish passage have drawn attention to restoring salmon and steelhead trout to the Alameda Creek. The multitude of fish passage improvement projects in the RSA and the advocacy work of the Alameda Creek Alliance indicate an ongoing effort to improve the health of steelhead habitat.

The overall health of the Central California Coast DPS steelhead in the RSA has been in decline since the 1950s. Until the 1950s, native fish species accounted for over 90% of total fish species within freshwater environments of the Alameda Creek watershed. By 1953-1969, the percentage of total species represented by native species had dropped to 61%, and by 1972-1987, the percentage of native species had further dropped to 46% of total species (Stanford, et. al., 2013). Native fish species currently comprise about 46% of the total fish species found in the watershed (19 of 41 total fish species) (Stanford, et. al., 2013). Occurrences like the construction of the BART weir in Fremont, the Calaveras Dam, and San Antonio and Del Valle reservoirs have severely modified Alameda Creek's quality of habitat. The operation of these three reservoirs and other water conveyance facilities altered natural flow regimes in streams below the dams, further degrading suitable steelhead spawning and rearing habitat in the lower Alameda Creek in Niles Canyon. Specifically, the City of Fremont's BART weir blocks fish passage between Alameda Creek and San Francisco Bay. The BART weir is a concrete grade control structure operated by the ACWD and is a located approximately 3.75 miles downstream from the Alameda Creek Bridge. Built in 1972, the BART weir imposes a major barrier to fish passage by preventing fish from leaving the Alameda Creek watershed. As a result, they are considered to be landlocked rainbow trout and do not receive protection under the FESA as anadromous Central California Coast DPS steelhead.

Alterations to the quality of the Alameda Creek habitat in the past sixty years indicate a severe decline in health of the species within the RSA. However, recent project trends to improve fish passage through Alameda Creek, and interest from conservation groups indicate the health of the resource is gradually improving. A future project by ACWD, ACFCD, and Water Conservation District plans to install a fish ladder at the existing BART weir, which currently blocks fish passage between Alameda Creek and the San Francisco Bay. The removal of this barrier to fish passage would allow the landlocked rainbow trout to be considered Central California Coast DPS steelhead and receive protection under FESA.

No take of steelhead is anticipated from the proposed Alameda Creek Bridge Replacement Project through the use of avoidance and minimization measures and the diversion of Alameda Creek. Indirect impacts may result from habitat exclusion and degradation of water quality from erosion or sediment loading as a result of construction activities. The water quality impacts are unlikely, given the proposed avoidance and

minimization measures and Caltrans BMPs. All Build Alternatives would permanently impact steelhead habitat. Permanent effects to the riverine habitat are anticipated through the installation of new bridge columns. The new pier footprint of all Build Alternatives would be smaller than the existing pier walls in the stream channel; there would be a reduction of hard structure within the stream channel. Proposed removal of the upstream weir should also reduce the amount of concrete structure. There are potential shade changes that could occur within the project area at Alameda Creek due to vegetation removal and changes to the bridge deck. Implementing the project would result in the removal of existing bridge footings from the creek channel and additional mitigation for the project would result in removal of the upstream concrete weir and removal of invasive giant reed populations. This would allow the stream to take on a more natural morphology and remove a low flow passage barrier to steelhead. Permanent and temporary effects to steelhead habitat are identified in Table 19 in Section 2.3.5.

The following projects within the RSA were identified as reasonably foreseeable and could involve potential effects to steelhead:

- Caltrans' Arroyo de La Laguna is currently in the early planning phase; impacts to steelhead and mitigation associated with the project have not yet been determined.
- Caltrans' I-680 HOV Lane Project involves impacts to steelhead associated with a bridge widening over Alameda Creek. The project impacts and associated mitigation will be documented in a project-specific biological study which is expected to be completed in winter 2014. Fish passage design and avoidance and minimization measures will be incorporated into the proposed project to ensure movement up and down gradient of the bridge and that impacts to steelhead are minimized.
- ACWD-ACFCD Joint Lower Alameda Creek Fish Passage Improvement. This project involves various improvements to fish passage in lower Alameda Creek including, but not limited, to the installation of a new fish ladder at the BART weir and a fish screening facility.
- City of Fremont's Old Canyon Bridge Replacement Project. This project has no effect on steelhead because it will be completed prior to the downstream fish passage project. Only temporary impacts will occur within Alameda Creek and the site will be restored to original conditions post-construction.
- ACFCD's Floodwall Improvements along Zone 3A (Ward Creek Flood Control Project). There will be no effects to steelhead due to downstream barriers preventing steelhead access to the project area.
- Alameda County Conservation District/Natural Resources Conservation Service's Stony Creek Fish Passage Improvement Project. This is a fish passage improvement project that will allow movement of steelhead past previous fish barriers.

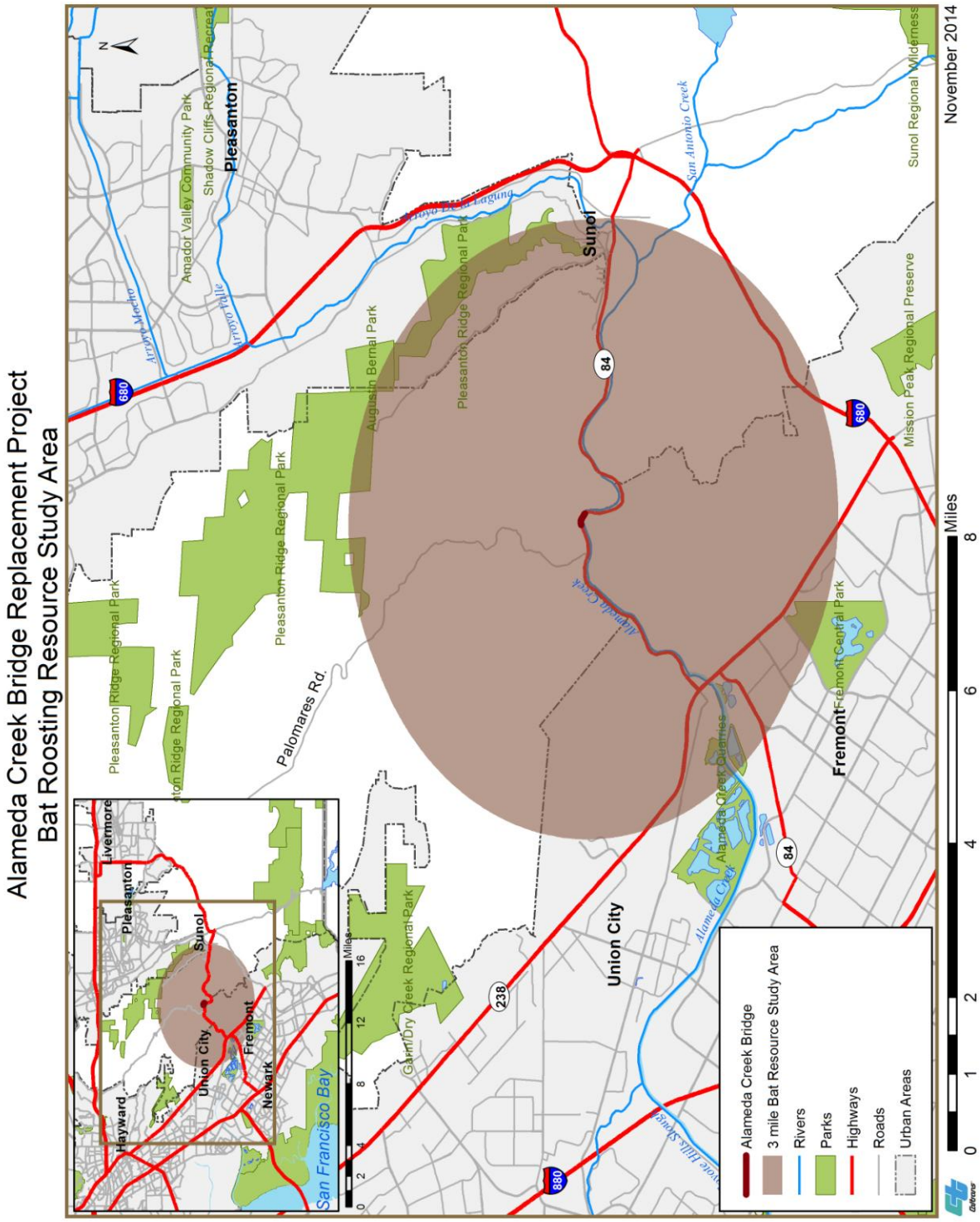
All Build Alternatives would contribute a positive cumulative effect to the resource and continue the general trend of improving the health of the species' habitat within the RSA. Although the proposed project would have short-term, temporary impacts to steelhead habitat, these temporary impacted areas would be restored after the project's construction.

The Alameda Creek Bridge Replacement Project would not result in an adverse contribution to cumulative impacts to the Central Coast DPS steelhead or its habitat. No additional mitigation measures are proposed besides those listed in Section 2.3.5.

2.4.4.9 Biological Environment: Roosting Bats

Roosting bats are identified as a resource to consider in this cumulative impact analysis because the demolition of the Alameda Creek Bridge would permanently remove a known day-and-night roost site for several species of bats, including the *Yuma myotis* (a species on CDFW's Special Animal List). The bats currently occurring at the project location do not have federal or state threatened or endangered species status, meaning that compensatory mitigation is not required for roosting bats. Eight special-status bat species have the potential to occur within the project's study limits based on range, habitat, and recorded occurrences in the region. Of these eight special-status bat species, the pallid bat has the largest known foraging range (three miles from a roost site) so the RSA for roosting bats was set at three miles from the roost site.

Figure 34. Roosting Bats Resource Study Area



General current population trends for the majority of bat species are unknown, as quantitative information on the population status of bats is scarce. However, declines of bat populations are increasingly documented and roost and habitat loss is a major threat to the continued survival of many species of bats (Fenton 1998, Altringham 1998). Bats in general may be under-reported to the CNDDB relative to their actual abundance in the environment because they are nocturnal, difficult to detect, and difficult to positively identify and count when detected. In addition to the lack of overall knowledge about bats, roosting bats do not have federal or state threatened or endangered species status. As described previously in this document's biological-environment cumulative-impact analysis sections, multiple county, state, and local programs, plans, and policies protect the Niles Canyon corridor from development. In consequence, the health of bat populations within the RSA is assumed to be stable.

Past projects identified in the RSA with potential impacts to roosting bats include the Niles Canyon 1 Project, the Sunol/Niles Dam Removal Project, Alameda Creek Pipeline Number 1 Fish Screen and Lago Los Osos Pipeline Project, and the Mission Valley Rock Expansion. The Niles 1 Project was terminated before the start of construction. Before project construction was terminated, approximately 150 trees in the project limits were removed. The impacts on roosting bats from the removal of these trees is unknown, however, it is assumed to be negligible given the extent of habitat provided by trees in the RSA. The Sunol/Niles Dam Removal Project and the Alameda Creek Pipeline Project included BMPs to avoid and minimize impacts to bats. The Mission Valley Rock Expansion mitigated for loss of bat roosting habitat as a result of project impacts through a Reclamation Plan to restore and increase the quality of habitat available to bats.

Additionally, three projects in the RSA are considered reasonably foreseeable and will impact bat species; these projects include the Old Canyon Road Bridge Foundation Protection Repair Project, the Niles Canyon Safety Improvements Project, and the Stonybrook Creek Fish Passage Improvement Project. Impacts to bats and the need for mitigation associated with the Niles Canyon Safety Improvements Project have not yet been determined, but the project may temporarily disrupt potential day and night roost habitat during tree removal. The Old Canyon Bridge Foundation Protection Repair Project includes pre-construction surveys for bats and will avoid roosts if they are found. The Stonybrook Fish Passage Improvement Project proposes to implement avoidance and minimization measures to avoid impacts to bats.

The demolition of the Alameda Creek Bridge would permanently remove a known day-and-night roost site for several species of bats. The Alameda Creek Bridge Replacement Project's contribution to cumulative impacts on roosting bats could be considered significant if there were other reasonably foreseeable projects in the RSA with impacts to roosting bats. However, the reasonably foreseeable projects in the RSA do not directly impact roosting bats through the implementation of project avoidance and minimization measures. Given the multiple county, state, and local programs, plans, and policies that protect the Niles Canyon corridor from development, it is assumed that the health of the resource is stable and that there is no cumulative impact occurring to roosting bats in the RSA. Furthermore, a continuity of bat habitat within the project limits would be provided

as the new Alameda Creek Bridge incorporates roosts specifically designed and built as habitat for bats. Caltrans will install the same amount of bat roosting habitat on the new Alameda Creek Bridge that is currently present on the existing bridge. As identified in Section 2.3.4, the construction of new daytime crevice roosts and recessed night roosts out of concrete into the underside of the new bridge structure will mitigate for the loss of day and night roosting habitat from the demolition of the existing bridge.

During the first two construction seasons of the new Alameda Creek Bridge, bat roosting habitat in the existing Alameda Creek Bridge would not be directly disturbed. However, the operation of equipment near known roost sites under the existing Alameda Creek Bridge has the potential to harass individual bats. Harassment of these individuals may result in the temporary avoidance of roost sites during project activities. Removal of the existing Alameda Creek Bridge during the third construction season would permanently remove a known day and night roost sites for several species of bats, including the *Yuma myotis* maternity roost. However, as stated above, bat habitat would be provided on the new Alameda Creek Bridge ensuring a continuity of habitat within the project limits at all times during construction activities.

While the new Alameda Creek Bridge would incorporate bat roosting habitat into the new Alameda Creek Bridge design, there is a possibility that bat populations roosting on the existing Alameda Creek Bridge may choose not to roost on the new Alameda Creek Bridge. Caltrans has had previous success with bats utilizing roosting structures installed on new bridges (Caltrans, 2004b). The roosting structures that would be installed on the new Alameda Creek Bridge would be similar to the current roosts available to bats on the existing bridge and similar to the roost structures that have proven successful on other Caltrans bridges. This increases the likelihood that bats would successfully migrate over to utilize the new Alameda Creek Bridge for roosting. It is assumed that the Alameda Creek Bridge's contribution to cumulative impacts on bats is not significant given the continuity of bat habitat provided in the project limits, the small number of projects in the Niles Canyon corridor that will impact bats, and the existing land use protections in Niles Canyon preventing extensive development. Furthermore, with the creation of suitable day and night roosting habitat on the new bridge, the restoration and enhancement of foraging habitat along the creek's riparian corridor, and the implementation of avoidance and minimization measures during construction, it is assumed that the Alameda Creek Bridge Replacement's contribution to cumulative impacts on bats would not be significant.

No additional avoidance, minimization, and/or mitigation measures are proposed for roosting bats besides those listed in Section 2.3.4 Animal Species.

Chapter 3 - Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners to determine the necessary scope of the environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency consultation and public participation for the Alameda Creek Bridge Replacement Project have been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings, interagency coordination meetings, and scoping meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

3.1 Scoping Process

3.1.1 Notice of Preparation

A Notice of Preparation (NOP) for the Alameda Creek Bridge Replacement EIR was published with the State Clearinghouse on February 27, 2014, in compliance with CEQA (the California State Clearinghouse number is 2010082001). The posting of the NOP initiated a 30-day public scoping period, during which federal, state, and local agencies as well as members of the public had the opportunity to provide comments on potential issues to be addressed in the EIR. Members of grassroot community groups and private individuals were notified of the NOP through email and through postcards mailed to the addresses that they had provided to Caltrans. Two scoping meetings were held, one in Sunol and a second in Fremont.

3.1.2 Advertising of Public Meetings

The scoping meetings were advertised in a variety of formats two weeks prior to the scheduled dates. Distribution methods included postcard mailings, letter notifications and email notifications to the Niles Canyon Stakeholder Listserve. Information was also posted on the Caltrans Niles Canyon Projects website (http://www.dot.ca.gov/dist4/nilescanyon/.). The advertisements provided public meeting logistics, explained the purpose of the public meetings, gave the schedule for the public scoping comment period, outlined additional ways to comment, and provided methods for obtaining more project information.

3.1.3 Scoping Meetings

The first meeting occurred in Sunol at the Glenn Elementary School, located at 11601 Main Street, from 7 pm – 9 pm. The second meeting was held in Fremont at the Niles Elementary School, located at 37141 Second Street, from 7 pm – 9 pm. The first public meeting was an open house style format with various informal display boards about the Alameda Creek Bridge Replacement Project and representatives from Caltrans present to answer project questions. Members of the public at the first scoping meeting requested a change in format for the second meeting. The second meeting at the Niles Elementary School included a project presentation given by the Caltrans Project Manager, Jack Siauw, followed by a formal question-and-answer session with a panel of project personnel. Sixteen people attended the first scoping meeting in Sunol and forty-nine people attended the second scoping meeting in Fremont.

Both scoping meetings displayed poster boards highlighting the different alternatives for members of the public to view. Project personnel from various fields, including landscape architecture, environmental analysis, biology, water quality, and engineering, were in attendance to speak with meeting attendees and address any questions and concerns related to the project. At both scoping meetings, attendees were asked to sign in, provided with a project informal handout, and informed of the meeting format and how to submit a comment about the project. The handout sheets contained information about the project, information about the CEQA process, and contact information for the project. The handouts and posters contained the following formation:

- The purpose of the meeting;
- Project description
- Project goals and need;
- Cost and funding for the project;
- Schedule for the environmental document;
- Similarities and differences among the four proposed alternatives; and
- Contact information for more information and to submit comments.

3.1.4 Opportunities for Public and Agency Comment

Members of the public and agencies had several methods for providing comments during the scoping period:

- Comments could be handwritten on comment cards at the two scoping meetings. Comment forms and pencils were provided to meeting attendees at both scoping meetings.
- Emails with comments could be sent to the project specific email address: NilesCanyonProjects@dot.ca.gov.
- Individual letters and comments could be mailed via U.S. Postal Service to:
  Melanie Brent
  Deputy District Director
  Caltrans District 4
  P.O. Box 23660
  Oakland, CA 94623

All comments were given equal consideration, regardless of method of transmittal.

3.2 External Agency Coordination

The Alameda Creek Bridge Replacement Project requires several permits and approvals as detailed in Chapter 1. The following provides a summary of agency consultation and professional contacts in advance of the Draft Environmental Document's release:

- March 6, 2014 – A technical assistance meeting was held in the field with Joe Heublein (NMFS) to discuss the project and the potential removal of the concrete weir upstream of the current bridge.
- March 26, 2014 – A technical assistance meeting was held in the field with Melissa Escaron (CDFW) and John Cleckler (USFWS) to describe the proposed project.
- June 4, 2014 – A meeting was held at Caltrans District 4 Office to discuss the proposed project. Attendees included John Cleckler, Melissa Escaron and Marcia

Grefsrud (CDFW), Holly Costa (USACE), Derek Beauduy (RWQCB), and Joe Heublein (NMFS). Discussion on the potential occurrence of California tiger salamander (CTS) occurred. Staff from USFWS and CDFW concluded that CTS would not likely be present in the proposed project area and that mitigation would not be required. Caltrans' proposed mitigation strategy also was discussed with agencies.

- June 24, 2014 – A meeting was held at Caltrans District Offices to discuss the proposed project with Jeff Miller (Alameda Creek Alliance).
- July 28, 2014 – A technical assistance meeting was held in the field with Holly Costa (USACE), Derek Beauduy (RWQCB), John Cleckler (USFWS) and three representatives from Alameda Creek Alliance.

Chapter 4 – List of Preparers

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Christopher States, Senior Environmental Planner, Office of Biological Sciences and Permits

Meghan Bishop, District Biologist, Office of Biological Sciences and Permits

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Douglas Bright, Associate Environmental Planner (Architectural History), Office of Cultural Resource Studies

Kathryn Rose, Senior Environmental Planner (Archeology), Office of Cultural Resource Studies

Kristina Montgomery, Associate Environmental Planner (Archeology), Office of Cultural Resource Studies

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Keith Suzuki, Landscape Associate, Office of Landscape Architecture

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Merlito Coloma, Transportation Engineer, Office of Water Quality

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Ray Boyer, Senior Transportation Engineer, Office of Environmental Engineering

Chris Wilson, Senior Transportation Engineer, Office of Environmental Engineering

Keith Fang, Transportation Engineer, Office of Environmental Engineering

Saif Mamoon, Traffic Systems

Garcia & Associates

Jason Minton, Wildlife Biologist

Alex Pries, Wildlife Biologist

William Kanemoto & Associates

William Kanemoto

WRECO

Grant Wilcox, Senior Engineer/Project Manager

Chapter 5 - Distribution List

Federal Agencies
Environmental Protection Agency, Region IX
Federal Activities Office, CMD-2
75 Hawthorne Street
San Francisco, CA 94105-3901

Natural Resources Conservation Service
Area I
1345 Main Street
Red Bluff, CA 96080

National Marine Fisheries Service
Joe Heublein
777 Sonoma Avenue Room 325
Santa Rosa, CA 95404

U.S. Army Corps of Engineers, Sacramento District
ATTN: Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814

U.S. Fish and Wildlife Service
2800 Cottage Way W-2605
Sacramento, CA 95825

State Agencies
California Transportation Commission
1120 N. Street, Room 2221 (MS-52)
Sacramento, CA 95814

State Clearinghouse, Executive Officer
1400 Tenth Street, Room 156
P.O. Box 3044
Sacramento, CA 95812-3044

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APPENDICES

Appendix A: CEQA Checklist

CEQA Environmental Checklist

04-ALA-84	13.0/13.6	16030
Dist.-Co.-Rte.	P.M/P.M.	E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE AND FOREST 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 Dept. 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 and Range Assessment Project and the Forest Legacy Assessment Project; and the 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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒
III. 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?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. 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 California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
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?	☐	☐	☒	☐
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
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?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
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?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
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 waste water?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. 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?	☐	☐	☐	☒
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?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
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 for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) 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?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial 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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES:				
a) Would the project 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:				
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
XV. RECREATION:				
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less-than-significant impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) 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?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to 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?	☐	☒	☐	☐
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)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Appendix B: Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

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March 2013

NON-DISCRIMINATION
POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone: (916) 324-0449, TTY: 711, or via Fax: (916) 324-1949.

MALCOLM DOUGHERTY
Director

"Caltrans improves mobility across California"

Appendix C: Avoidance, Minimization, and/or Mitigation Summary

Aesthetics/Visual
VISUAL-1. To address loss of existing aesthetic bridge design features, and to off-set potential corridor-wide cumulative visual impacts, context-sensitive design features shall be considered where feasible, including: • See-through bridge and viaduct barrier design, preferably concrete Texas Bridge Railing C412 or metal ST-70 rail. • If approved, the metal ST-70 rail could be treated with a flat brown color to reduce glare of metal finish and blend into surrounding setting. • Metal guardrail should be treated with coating to turn bright metal surfaces to a dull brown color, to reduce glare and blend with surroundings.
VISUAL-2. The following upslope retaining wall measures will be implemented: • Minimize the overall height of walls to the greatest extent feasible. In general, from a visual perspective, downslope widening is preferable and has less impact than upslope widening. Downslope widening may, however, have other environmental effects and would require evaluation for feasibility in light of those effects. • Use appropriate context-sensitive wall texture and/or color treatments on all upslope and downslope walls as identified in the visual impact assessment, to minimize contrast with the existing natural and historic settings. Concrete safety-shape barriers shall receive color stain to lower contrast with the walls and reduce glare. Surface texture treatments shall be developed in consultation with local agencies. • Employ color staining of the concrete safety barrier of upslope retaining walls to reduce overall contrast between the walls and the barriers. • Coordinate wall and concrete safety-shape barrier aesthetic treatments and carry consistent themes throughout the corridor. • Where anchored or draped wire mesh slope protection is required: • Wherever feasible, apply hydroseeded revegetation including locally native species to blend with the surrounding setting. • Wire mesh shall be selected to match color and value of the underlying soil substrate to the greatest feasible extent in order to minimize visual contrast: For example, light-colored mesh over light-colored substrate; dark-colored mesh over dark substrate.
VISUAL-3. The following tree and vegetation removal measures will be implemented: *a. Minimization or Avoidance of Tree/Vegetation Removal Due to Construction* • Minimize removal of large native riparian trees to the greatest extent feasible. • In areas where maximum protection of vegetation is desirable, as determined during the project design phase, clear and grub only within excavation and embankment slope limits. • Protect existing vegetation outside of clearing and grubbing limits from the contractor's operations, equipment, and materials storage. • Limit tree trimming by the contractor to that required to provide a clear work area.

- Limit clearing and grubbing behind upslope retaining walls to a maximum of 5 feet from the back of the wall.
- Place high visibility temporary fencing around significant trees or other desirable vegetation to be protected before roadway construction begins.
- The Engineer would field mark and approve all trees to be removed prior to removal.
- Adjust slope lines wherever feasible to avoid the removal of trees and other desirable vegetation.
- Implement design exceptions to avoid removal of significant existing vegetation. Design exceptions may include reducing the width of the standard grading catch line to minimize vegetation removal; steepening of cut and fill slopes; installing guardrails around any trees classified as a scenic resource to allow retention at the shoulder; or other measures as recommended in the visual impact assessment or as determined during the project design or construction phases.
- Take particular care in revegetating and enhancing the area of superseded roadway south of the western bridge approach, to achieve a natural appearance in the short term and to enhance presence of oak woodland in the roadway foreground of this segment.

b. Mitigation of West Embankment Impacts to Niles Canyon Railway, Build Alternative 1

- Implement dense tree re-planting and re-vegetation on the north-facing berm of the western approach under Build Alternative 1 to provide screening and minimize visibility of project as seen by Niles Canyon Railway passengers where feasible

c. Tree Replacement at East Down-slope Retaining Wall under Build Alternatives 1 and 2

- If views of the retaining wall from the Niles Canyon Railway due to tree removal for wall construction are identified, visual screening shall be restored through replacement planting of trees within State right-of-way as needed to restore visual screening from Niles Canyon Railway.

d. Highway Planting

- Implement required mitigation planting per Chapter 29 (Highway Planting) of the Caltrans Project Development Procedures Manual and Chapter 900 (Landscape Architecture) of the Caltrans Highway Design Manual.
- Replace all disturbed areas of native vegetation in kind at a minimum ratio of 1:1.
- Fund required mitigation planting through the parent roadway contract, programmed and completed as a separate contract within two years of completion of all roadwork.
- Provide all disturbed areas with permanent erosion-control grasses.

e. Revegetation

- All disturbed areas shall be provided with permanent erosion-control grasses and appropriate, locally native revegetation. Trees removed as a result of construction operations shall be replaced at a minimum ratio of 1:1 at locations closest to the impacted area wherever feasible and, where in-place planting is not feasible, off-site in the corridor visual foreground and in kind. Actual replacement ratios could be higher and would be determined by the Project Biologist.

VISUAL-4. The following construction impact measures will be implemented:

• Place unsightly material, equipment storage and staging so that they are not visible within the foreground of the highway corridor to the extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors. • Screen construction, staging, and storage areas by visually opaque screening wherever they would be exposed to public view for extended periods of time. • Phase construction activities to minimize the duration of disturbance to the shortest feasible time. • Revegetate all areas disturbed by construction, staging, and storage per Measure VISUAL-3, above. • Limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed. • Where the existing roadway is to be superseded, existing pavement and roadbed shall be removed and contour graded to provide a natural appearance and blend with the adjacent landform. Graded areas shall be revegetated as described under measure VISUAL-3, above. • Equipment access and storage for retaining wall construction under Build Alternatives 1 and 2 shall be restricted to the west bank of the creek in the segment south of the bridge to the greatest feasible extent. Where such restriction is unavoidable, damage to the trees and forest canopy on the creek's east bank shall be minimized to the smallest feasible area of disturbance, and be revegetated with replacement native riparian trees immediately following project completion.
Biological Resources (Specific Species Measures)
TREES-1. Caltrans will provide tree replacement on-site at a minimum 1:1 ratio in the existing SR-84 alignment for upland trees. Depending on the Build Alternative selected and the number of upland trees able to be planted on-site, there may be a need for off-site mitigation planting (at a location to be determined). Mitigation for trees removed from the riparian zone will be mitigated at a 3:1 ratio and will be replanted within the Alameda Creek watershed, with as many riparian mitigation trees planted on-site as possible. Details for off-site mitigation planting for permit requirements will be determined in coordination with CDFW and permitting requirements.
WETLANDS-1. Compensatory mitigation under the Clean Water Act at a minimum one-to-one ratio is required for all permanent wetland impacts. Proposed compensation for wetland impacts include removal of the concrete weir upstream of the existing bridge, removal of current in-stream bridge columns for the existing bridge, removal of invasive giant reed populations within the project area, and restoring and re-vegetating all temporarily impacted wetlands.
PLANT-1. Additional seasonally-timed special-status plant surveys will occur prior to project construction. If protected species are discovered, appropriate agency coordination and protective measures will be established.
WOODRAT-1. Caltrans will request a Memorandum of Understanding (MOU) with CDFW to develop and implement a relocation plan for Woodrat houses that will be affected by the proposed project.
BATS-1. To mitigate for the loss of day and night roosting habitat from the removal of the existing bridge, Caltrans will incorporate constructed daytime crevice roosts and recessed night roosts out of concrete into the underside of the new bridge structure.
BATS-2. A roosting bat exclusion plan will be implemented during the non-breeding season.

BATS-3. No more than two weeks prior to tree removal, a qualified biologist will conduct a pre-construction survey for crevice and cavity roosting habitat in trees within the project area that are 12 inches or greater in diameter at breast height. If active roosting habitat is identified, minimization measures will be identified through coordination with CDFW.
CRLF-1. Caltrans will provide compensation for impacts to CRLF through on-site restoration of temporarily impacted areas (at a 1:1 ratio), and of compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. A portion of this proposed compensation will be covered by the on-site restoration of the current bridge columns and roadway approaches.
AWS-1. Compensation for the minor disturbance to AWS Critical Habitat Unit 3 for AWS will occur through on-site restoration of temporarily impacted areas (at a 1:1 ratio), on-site restoration and enhancement of the existing SR-84 roadway and through compensation for permanently impacted areas (at a 3:1 ratio) through a combination of off-site habitat preservation and on-site restoration and enhancement activities. A portion of the proposed compensation for permanent impacts will be covered by the on-site restoration of the current bridge columns and roadway approaches.
STEELHEAD-1. Permanent effects to steelhead habitat as a result of the proposed project would be off-set through the restoration of ripairian, wetland, and riverine areas currently occupied by the existing Alameda Creek Bridge piers and abutments and the removal of invasive giant reed populations in the project area. Additionally, all Build Alternatives propose to remove the remnants of the existing footings and concrete wall of a former bridge, located upstream of the existing Alameda Creek Bridge. The removal of these bridge and concrete wall footings is proposed as part of the Alameda Creek Bridge Replacement Project to address anticipated compensatory-mitigation requirements for project impacts under the federal ESA consultation. These bridge footings and concrete wall act as a weir and serve as a low flow fish passage barrier. Removal or modification of the concrete weir during low-flow conditions would provide further connectivity to the creek system for juvenile steelhead.
INVASIVE-1. The project will remove invasive giant reed populations located within the project footprint and be replaced with native vegetation.
Biological Resources (General Project Design Measures)
BIOLOGY-1. Permits. Caltrans will include a copy of the all relevant permits within the construction bid package of the proposed project. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the USFWS Biological Opinion (BO) and the CDFW Incidental Take Permit.
BIOLOGY-2. Biological Monitor Approval. Caltrans will submit the names and qualifications of the biological monitor(s) for USFWS approval prior to initiating construction activities for the proposed project.
BIOLOGY-3. Biological Monitoring. The agency-approved biologist(s) will be on-site during initial ground-disturbing activities, and thereafter as needed to fulfill the role of the approved biologist as specified in project permits. The biologist(s) will keep copies of applicable permits in their possession when on-site. Through the Resident Engineer or their designee, the agency-approved biologist(s) shall be given the authority to communicate either verbally, by telephone, email or hardcopy with all project personnel to ensure that take of listed species is minimized and permit requirements are fully implemented. Through the Resident Engineer or their designee, the

agency-approved biologist(s) shall have the authority to stop project activities to minimize take of listed species or if he/she determines that any permit requirements are not fully implemented. If the agency-approved biologist(s) exercises this authority, the agencies shall be notified by telephone and email within 48 hours.
BIOLOGY-4. Worker Environmental Awareness Training. All construction personnel will attend a mandatory environmental education program delivered by an agency-approved biologist prior to working on the project.
BIOLOGY-5. Pre-construction Surveys. Prior to any ground disturbance, pre-construction surveys will be conducted by an agency-approved biologist for listed species. These surveys will consist of walking surveys of the project limits and, if possible, accessible adjacent areas within at least 50 feet of the project limits. The biologist(s) will investigate all potential cover sites. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris. Native vertebrates found in the cover sites within the project limits will be documented and relocated to an adequate cover site in the vicinity.
BIOLOGY-6. Prevention of Wildlife Entrapment. To prevent inadvertent entrapment of listed species during construction, excavated holes or trenches more than one foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional four-foot high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional four-foot high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape or the USFWS will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours.
BIOLOGY-7. Wildlife Exclusion Fencing. The limits of construction zones within suitable habitat for listed species will be delineated with high visibility wildlife exclusion fencing at least four feet in height to prevent wildlife from accessing the construction footprint. The fencing will be removed only when all construction equipment is removed from the site. No project activities will occur outside the delineated project area. Wildlife exclusion fencing is not required for construction activities occurring outside of suitable habitat for listed species.
BIOLOGY-8. Listed Species On Site. The Resident Engineer will immediately contact the agency-approved project biologist(s) in the event that an Alameda whipsnake or California red-legged frog is observed within a construction zone. The Resident Engineer will suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or an agency approved protocol for removal has been established.
BIOLOGY-9. Work Window. All work within suitable aquatic habitat for steelhead and California red-legged frog will occur between June 1 and October 15, when there is less potential for an individual to enter the work area. All work within suitable upland habitat for California red-legged frog and Alameda whipsnake will occur between March 1 and November 30. During this time, Alameda whipsnake is typically active and able to move away from construction activities to avoid harm, and California red-legged frog will have a lower potential for movements across upland habitat.

BIOLOGY-10. Work Window for Nesting Birds. To the extent practicable, clearing and grubbing activities will be conducted during the non-nesting season, from September 1 to February 14.
BIOLOGY-11. Pre-construction Surveys for Nesting Birds. Pre-construction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to the start of construction for activities occurring during the breeding season (February 15 to August 31).
BIOLOGY-12. Non-Disturbance Buffer for Nesting Birds. If work is to occur within 300 feet of active raptor nests or 50 feet of active passerine nests, a non-disturbance buffer will be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential disturbance.
BIOLOGY-13. Bat Day and Night Roost Avoidance. Specific day and night bat roost avoidance and minimization measure will be developed through technical assistance with CDFW and bat specialists.
BIOLOGY-14. Incorporation of Bat Roosting Habitat into New Bridge: Bridge elements and configurations that support night and day roosting should be installed where feasible in the new Alameda Creek Bridge. Bridge replacements should consider use of a similar bridge design when the roost is large, unique or supports a rare species. Critical issues include access, ventilation, and protection. Crevice roosts should be replaced with crevices of similar area and cavities should be replaced with cavities of similar parameters. If this is not possible due to engineering requirements, e.g., safety, replacement habitat may be considered. Supplemental habitat may also be considered when exclusion will occur for more than one season.
BIOLOGY-15. Exclusion of Bats from Existing Bridge: Prior to the de-construction of the existing Alameda Creek Bridge, a roosting bat exclusion plan will be developed and implemented. At a minimum, this plan should address how one-way exclusion devices will be used to allow bats to safely exit the current bridge prior to its removal. Exclusion of bats would only occur between October and March to avoid the reproductive season.
BIOLOGY-16. Water Diversion Structures. Cofferdam and/or water diversion will be constructed to exclude construction activities from adversely impacting the water quality of Alameda Creek while maintaining flow through the project area. The contractor will be required to submit a Water Diversion Plan to appropriate regulatory agencies for approval prior to construction.
BIOLOGY-17. Water Quality Inspection. Water quality inspector(s) will inspect the site after a rain event to ensure that the stormwater BMPs are adequate.
BIOLOGY-18. Vehicle Use. Project employees will be required to comply with guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
BIOLOGY-19. Night Work. To the extent practicable, nighttime construction will be minimized.
BIOLOGY-20. Night Lighting. Artificial lighting of the proposed project area during nighttime hours will be minimized to the maximum extent practicable.
BIOLOGY-21. Trash Control. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the work area.
BIOLOGY-22. Firearms. No firearms will be allowed in the project area except for those carried by authorized security personnel,

or local, State, or Federal law enforcement officials.
BIOLOGY-23. Pets. To prevent harassment, injury or mortality of sensitive species, no pets will be permitted on the project site.
BIOLOGY-24. Caltrans Standard BMPs. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The State Water Resources Control Board has issued a National Pollution Discharge Elimination System Statewide Storm Water Permit to Caltrans to regulate storm water and non-storm water discharges from Caltrans facilities. A SWPPP will be developed for the project, as one is required for all projects that have at least 1.0 acre of soil disturbance. The SWPPP complies with the Caltrans Storm Water Management Plan (SWMP). The SWMP includes guidance for Design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. The SWPPP will reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges and can be found at the following website: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm Protective measures will be included in the contract, including, at a minimum: a. No discharge of pollutants from vehicle and equipment cleaning are allowed into the storm drain or water courses. b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses. c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses. d. Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require. e. Coir rolls will be installed along or at the base of slopes during construction to capture sediment and temporary organic hydro-mulching will be applied to all unfinished disturbed and graded areas. f. Work areas where temporary disturbance has removed the pre-existing vegetation will be restored and re-seeded with a native seed mix. g. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls along toe of slopes or along edges of designated staging areas, and erosion-control netting (such as jute or coir) as appropriate. h. A Revegetation Plan will be prepared for restoration of temporary work areas. Pavement and base will be removed; topography blended with the surrounding area; and topsoil will be salvaged from the new alignment area to be placed over the restored area, which will then be revegetated with native grassland species.
BIOLOGY-25. Monofilament Erosion Control. Plastic mono-filament netting (erosion control matting) or similar material will not be used for the project because California red-legged frog and Alameda whipsnake may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

BIOLOGY-26. Concrete Waste and Stockpiles. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage feature.
BIOLOGY-27. Revegetation Following Construction. All areas that are temporarily affected during construction will be revegetated with an assemblage of native grass, shrub, and trees as appropriate. Invasive, exotic plants will be controlled within the project area to the maximum extent practicable, pursuant to Executive Order 13112.
Climate Change
CLIMATE CHANGE-1. According to Caltrans' Standard Specifications, the contractor must comply with all of the Bay Area Air Management District rules, ordinances, and regulations regarding air quality restrictions
CLIMATE CHANGE-2. Compliance with Title 13, California Code of Regulations – Adopted by the Air Resources Board on June 15, 2008, this regulation would restrict idling of construction vehicles to no longer than 5 consecutive minutes. The contractor must comply with this regulation in order to reduce harmful emissions from diesel-powered construction vehicles.
CLIMATE CHANGE-3. To the extent that it is feasible for the project, the use of reclaimed water may be used to reduce GHG emissions produced during construction. Currently 30 percent of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, which reduces greenhouse gas emissions from electricity production.
Cultural Resources
CULTURAL-1. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
CULTURAL-2. If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Kathryn Rose, Branch Chief-Archeology so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.
CULTURAL-3. Caltrans will investigate nearby locations that are suitable to place interpretive panels that discuss the history of transportation in Niles Canyon and the Alameda Creek Bridge's role in it. If Caltrans identifies a suitable location off the highway, interpretive panels will be installed. Caltrans will also prepare a brochure presenting this information to be placed in local libraries and historical societies.
CULTURAL-4. If approved for use by Caltrans, all Build Alternatives will select the Texas Bridge Railing (C412), a see-through bridge railing that emulates the bridge railing of the existing Alameda Creek Bridge. The use of C412 will be considered as partial mitigation for the loss of a historic resource.
CULTURAL-5. Recordation efforts documenting the Alameda Creek Bridge structure will occur prior to demolition activities.
Geology/Soils/Seismic/Topography

GEOLOGY-1. For Build Alternatives 3A and 3B, Caltrans will examine top of the wall treatments to minimize ground disturbance above rock cuts.
Hazardous Waste/Materials
HAZ-1. If the project design shows that construction will result in a surplus of excavated material, a site investigation will be conducted to characterize the soil.
HAZ-2. Materials found to contain lead at concentrations above those considered potentially hazardous to either human health or the environment will be handled in accordance with all local, state, and federal rules and regulations and appropriate measures included in the Alameda Creek Bridge Replacement Project's plans and specifications package
HAZ-3. A lead-based paint survey and an asbestos-containing material survey for the existing Alameda Creek Bridge structure will be conducted during the project's design phase to plan and develop hazardous materials-related construction specifications.
Hydrology/Floodplains
HYDROLOGY-1. Temporary Sediment Retention and Release: Implement temporary structure (such as plywood cofferdam or a weir constructed with large cobbles) to retain the impounded sediment. The structure will be designed to withstand low to medium flows that would minimally disperse the impounded sediment and potentially cause nuisance sediment deposits that could impede passage by fish and other aquatic organisms. The temporary structure would be designed to wash out (large cobbles) or be removed (plywood cofferdam) prior to a high flow event, allowing the high flow to disperse the sediment more evenly to downstream reaches.
HYDROLOGY-2. Staged Weir Removal: This measure consists of the gradual removal of the weir to minimize potential nuisance sediment deposits in downstream reaches. Portions of the weir would be selected for lowering or removal at any one time; the weir would be removed over the course of several years. This option allows the existing weir to moderate sediment dispersion and eliminates the need to construct a temporary structure.
HYDROLOGY-3. Draw Down Rate: Weir removal should accommodate the release of impounded water at a slow rate, taking place over the course of several days to minimize the risk of supersaturation and take of listed species. In addition, this measure would reduce bank erosion associated with a pulse of water greater than the normal natural variation.
HYDROLOGY-4. Vegetative Stabilization: After the weir is removed and the water level drops, this measure would strategically plant vegetation species with vigorous growth habits to stabilize some of the sediment in place. Emergent vegetation species, such as cattail and bulrush, would be planted along the margin of the low flow channel, and riparian species, including willow, mulefat, California blackberry, and tall flatsedge, would be planted in the overbank areas. The intent of the vegetation would not be to permanently stabilize the sediment, as high flow conditions are likely to uproot new plantings and wash them downstream. Rather, the vegetation would be a temporary measure to mitigate the magnitude of the sediment pulse to downstream reaches. It is estimated that it would take approximately two to five years for the vegetation to have a stabilizing effect, so the performance of this option is uncertain.
Paleontology
PALEONTOLOGY-1: A PMP defining specific mitigation measures and methods, will be prepared and implemented before construction begins. The PMP may include:

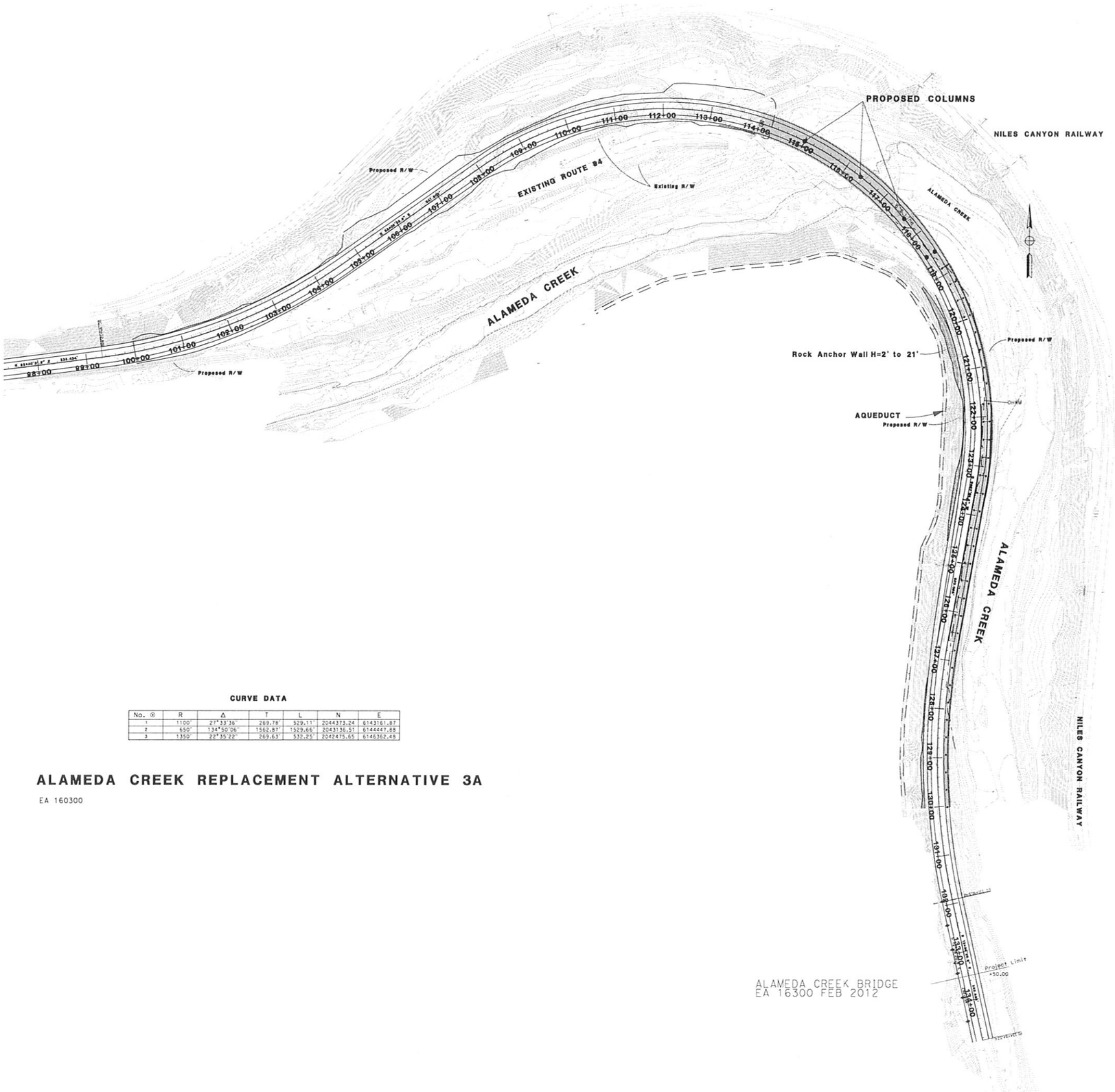
• The presence of the Principal Paleontologist at pre-construction meetings to consult with the construction contractor. • Paleontological awareness training for construction workers to be provided for by the Principal Paleontologist. • Monitoring of ground disturbing activities such as excavation by the paleontological monitors, to be conducted under the supervision and/or at the direction of the Principal Paleontologist. • Temporary halting or diversion of construction activities in areas where fossils are discovered. • Preparation, sorting, and cataloging of fossils collected during the monitoring and salvage. Fossils are prepared to the point of identification, not display. • Curation of fossils, along with copies of all pertinent field notes, photos, and maps at a curation facility acceptable to Caltrans. • Preparation of the Paleontological Mitigation Report to document the results of the mitigation program.
Parks and Recreational Facilities
PARKS/REC-1. Caltrans will continue to participate in EBRPD's multi-agency development team for the future Niles Canyon Class 1 bicycle trail.
Traffic and Transportation/Pedestrian and Bicycle Facilities
TRAFFIC-1. A TMP will be prepared during the detailed design phase for the selected Build Alternative and implemented prior to the construction of the project. The plan will be prepared in accordance with Caltrans requirements and guidelines and will address traffic impacts from staged construction and specific traffic handling concerns during the construction of the project. Implementing the TMP will involve the dissemination of press releases, and other documents to adequately notify and inform motorists, community groups, local entities, emergency services, and elected official of upcoming road construction activities. This responsibility includes advance notification to local newspapers, television and radio stations, and emergency response providers. Caltrans construction staff will also submit weekly information regarding the traffic impacts to SR-84 to the Caltrans District 4 Public Information Office. This information will be included in the Weekly Traffic Update, which Caltrans disperses to news media outlets and other interested agencies.
Utilities/Emergency Services
UTL-1. Power lines will be relocated to avoid affecting power service.
Water Quality and Storm Water Runoff
WATER-1. A stream diversion will be installed during construction to minimize the export of sediment and pH issues from disturbed soil areas and fresh concrete in work areas within the streambed. Haul roads within the Alameda Creek streambed will be constructed using native material in the creek which will be leveled when no longer needed for construction activities.
WATER-2. In accordance with SWRCB CGP (Order No. 2012-006-DWQ), water samples will be taken upstream and downstream of the Alameda Creek Bridge Replacement Project to establish a baseline to limit the amount of pollutants that leave the project site.
WATER-3. A SWPPP will be required that presents that strategy for implementation of temporary constructions site BMPs. The SWPPP will be prepared by the contractor and approved by the Department.
WATER-4. Stockpile areas for construction materials, equipment, and debris will be minimized to minimize the removal of riparian and upland vegetation.

WATER-5. Caltrans' Standard Best Management Practices will be implemented to avoid or minimize the discharge of pollution during and after construction to the maximum extent practicable. In general, these BMP's are grouped by the following categories:

- Design Pollution Prevention BMPs: These BMPs are permanent measures designed mainly for purposes other than Water Quality that improve stormwater quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Design Pollution Prevention BMPs may include riprap for drainage improvements. Erosion control measures will be provided on all disturbed areas.
- Temporary Construction Site BMPS: these BMPs are implemented throughout the duration of construction activities, in order to avoid and minimize pollutant loads in potential stormwater/non-stormwater discharges. Construction Site BMPS strategies applicable to this project may include the followings:
    - Soil Stabilization: scheduling, preservation of existing vegetation, slope protection, slope interrupter devices, and channelized flows;
    - Tracking Controls: stabilized construction entrance and exist;
    - Wind Erosion Controls: temporary covers;
    - Non-Stormwater Management: vehicle and equipment operations (fueling, cleaning and maintenance), and material and equipment use;
    - Waste management and Materials Pollution Control: concrete wash-out, material delivery and storage, material use, stockpile management, spill prevention and control, soil waste management, hazardous waste and/or contaminated soil management, liquid waste management and lead abatement and containment
- Permanent Treatment BMPs: These BMPs are permanent water quality controls measures used to remove pollutant from stormwater runoff prior to being discharged from Caltrans right of way. Treatment BMPs are permanent devices and facilities treating stormwater runoff. Typical Treatment BMPS are biofiltration strips or swales with or without soil amendment, infiltration, basins, and media filters, litter capture devices.
- Hydromodification Management (HM) Controls: These controls are permanent measures used to control increases in peak runoff flow and volume from the project's new impervious surfaces to minimize erosion in downstream water courses. HM controls include volume-based flow control structures. As this project is subject to both stormwater treatment and HM requirements, cost-effective BMPs/controls will be designed, where feasible, to meet both these requirements.

  The Water Board stipulates treatment and hydromodificaton requirements on project by project basis. The San Francisco Water Board typically accepts bioretention systems for addressing hydromodificaton. These provide storage for runoff that helps to attenuate peak flows and maintain an acceptable flow-duration regime. Right of Way requirements along the Niles Canyon corridor would make the use of bio-retention systems challenging. Other solutions that may help to overcome these challenges would include infiltration trenches and enlarged drainage pipes.

Appendix D: Location Hydraulic Study Federal Insurance Rate Maps and Base Flood Elevation Table



CURVE DATA

No. ⊙	R	Δ	T	L	N	E
1	1100'	27°33'36"	269.78'	529.11'	2044373.24	6143161.87
2	650'	134°50'06"	1562.87'	1529.66'	2043136.51	6144647.68
3	1350'	22°35'22"	269.63'	532.25'	2042475.65	6146362.48

ALAMEDA CREEK REPLACEMENT ALTERNATIVE 3A

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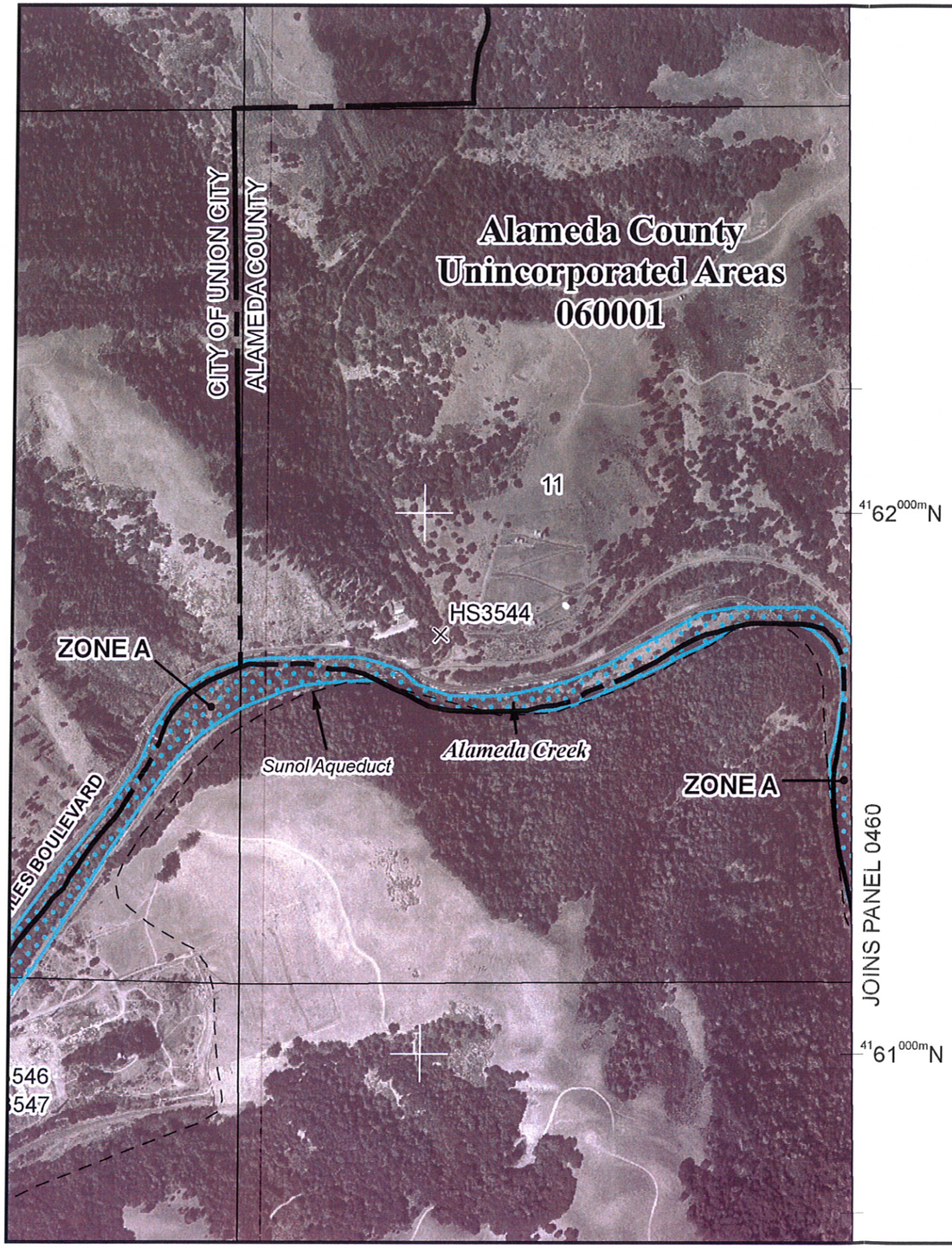
Rdwy Sta	River Sta	Plan	W.S. Elev (ft)	Δ W.S. (ft)	Δ W.S. (in)	Δ W.S. is the increase in elevation between existing and proposed conditions
134+80	3652.5	Ala Rdwy Exist	167.6			
		Ala rdwy Prop	167.95	0.35	4.2	
134+60	3632.5	Ala Rdwy Exist	167.45			
		Ala rdwy Prop	167.81	0.36	4.3	
134+20	3592.5	Ala Rdwy Exist	167.41			
		Ala rdwy Prop	167.78	0.37	4.4	
133+80	3552.5	Ala Rdwy Exist	167.33			
		Ala rdwy Prop	167.71	0.38	4.6	**W.S. encroaches on Proposed Roadway**
133+20	3492.5	Ala Rdwy Exist	167.34			**W.S. encroaches on Existing Roadway**
		Ala rdwy Prop	167.72	0.38	4.6	**W.S. encroaches on Proposed Roadway**
132+60	3432.5	Ala Rdwy Exist	167.39			
		Ala rdwy Prop	167.77	0.38	4.6	
132+00	3372.5	Ala Rdwy Exist	167.39			
		Ala rdwy Prop	167.77	0.38	4.6	
131+40	3312.5	Ala Rdwy Exist	167.31			
		Ala rdwy Prop	167.7	0.39	4.7	
130+80	3252.5	Ala Rdwy Exist	167.22			
		Ala rdwy Prop	167.62	0.4	4.8	
130+20	3192.5	Ala Rdwy Exist	166.82			
		Ala rdwy Prop	167.26	0.44	5.3	**Maximum increase in Water Surface Elevation**
130+00	3172.5	Ala Rdwy Exist	166.88			
		Ala rdwy Prop	167.31	0.43	5.2	
129+40	3112.5	Ala Rdwy Exist	166.79			
		Ala rdwy Prop	167.2	0.41	4.9	
128+80	3052.5	Ala Rdwy Exist	166.64			
		Ala rdwy Prop	167.06	0.42	5.0	
128+00	2972.5	Ala Rdwy Exist	165.84			
		Ala rdwy Prop	166.15	0.31	3.7	
127+80	2952.5	Ala Rdwy Exist	166.04			

		Ala rdwy Prop	166.42	0.38	4.6	
127+60	2932.5	Ala Rdwy Exist	166.09			
		Ala rdwy Prop	166.38	0.29	3.5	
127+00	2872.6	Ala Rdwy Exist	165.86			**W.S. encroaches on Existing Roadway**
		Ala rdwy Prop	166.18	0.32	3.8	**W.S. encroaches on Proposed Roadway**
126+40	2807.3	Ala Rdwy Exist	165.41			
		Ala rdwy Prop	165.76	0.35	4.2	
126+00	2772.6	Ala Rdwy Exist	165.32			
		Ala rdwy Prop	165.55	0.23	2.8	
124+80	2652.6	Ala Rdwy Exist	165.18			
		Ala rdwy Prop	165.36	0.18	2.2	
123+60	2533.2	Ala Rdwy Exist	163.96			
		Ala rdwy Prop	164.11	0.15	1.8	
122+80	2429.3	Ala Rdwy Exist	163.43			
		Ala rdwy Prop	163.55	0.12	1.4	
121+80	2314.0	Ala Rdwy Exist	163.1			
		Ala rdwy Prop	163.22	0.12	1.4	
120+60	2178.0	Ala Rdwy Exist	162.81			
		Ala rdwy Prop	163.02	0.21	2.5	
119+60	2047.6	Ala Rdwy Exist	161.06			
		Ala rdwy Prop	161.53	0.47	5.6	
118+80	1933.0	Ala Rdwy Exist	158.69			
		Ala rdwy Prop	158.84	0.15	1.8	
118+60	1920.0	Ala Rdwy Exist	158.23			**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	157.65	-0.58	-7.0	
118+40	1897.0	Ala Rdwy Exist	157.51			**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	157.17	-0.34	-4.1	
118+00	1817.1	Ala Rdwy Exist	157.66			**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	157.66	0	0.0	
117+80	1726.5	Ala Rdwy Exist	158.79			**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	158.79	0		

117+60	1711.7	Ala Rdwy Exist	158.53		**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	158.53	0	
117+40	1654.9	Ala Rdwy Exist	159.71		**These Roadway Stations approximated as cross-sections not parallel to road**
U/S Prop Bridge		Ala rdwy Prop	159.71	0	
114+00	1613.0	Ala Rdwy Exist	159.72		**These Roadway Stations approximated as cross-sections not parallel to road**
D/S Prop Bridge		Ala rdwy Prop	159.72	0	
113+20	1592.8	Ala Rdwy Exist	159.57		**These Roadway Stations approximated as cross-sections not parallel to road**
U/S Exist Bridge		Ala rdwy Prop	159.57	0	
112+80	1536.9	Ala Rdwy Exist	159.61		**These Roadway Stations approximated as cross-sections not parallel to road**
D/S Exist Bridge		Ala rdwy Prop	159.61	0	
112+60	1403.3	Ala Rdwy Exist	158.94		**These Roadway Stations approximated as cross-sections not parallel to road**
		Ala rdwy Prop	158.94	0	
112+00	1302.7	Ala Rdwy Exist	158.4		
		Ala rdwy Prop	158.4	0	
111+00	1192.8	Ala Rdwy Exist	157.37		
		Ala rdwy Prop	157.37	0	
109+80	1079.5	Ala Rdwy Exist	155.87		
		Ala rdwy Prop	155.87	0	
108+00	933.4	Ala Rdwy Exist	151.85		
		Ala rdwy Prop	151.85	0	
106+80	784.7	Ala Rdwy Exist	148.47		
		Ala rdwy Prop	148.47	0	
105+60	677.0	Ala Rdwy Exist	147.31		
		Ala rdwy Prop	147.31	0	
104+60	575.8	Ala Rdwy Exist	149.76		
		Ala rdwy Prop	149.76	0	
103+60	471.5	Ala Rdwy Exist	149.37		
		Ala rdwy Prop	149.37	0	
102+60	354.0	Ala Rdwy Exist	147.17		
		Ala rdwy Prop	147.17	0	
101+20	208.2	Ala Rdwy Exist	146		
		Ala rdwy Prop	146	0	

100+00	78.9	Ala Rdwy Exist	145.68	
		Ala rdwy Prop	145.68	0



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0455G

FIRM

FLOOD INSURANCE RATE MAP

ALAMEDA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 455 OF 725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALAMEDA COUNTY	060001	0455	G
FREMONT, CITY OF	065028	0455	G
UNION CITY, CITY OF	060014	0455	G

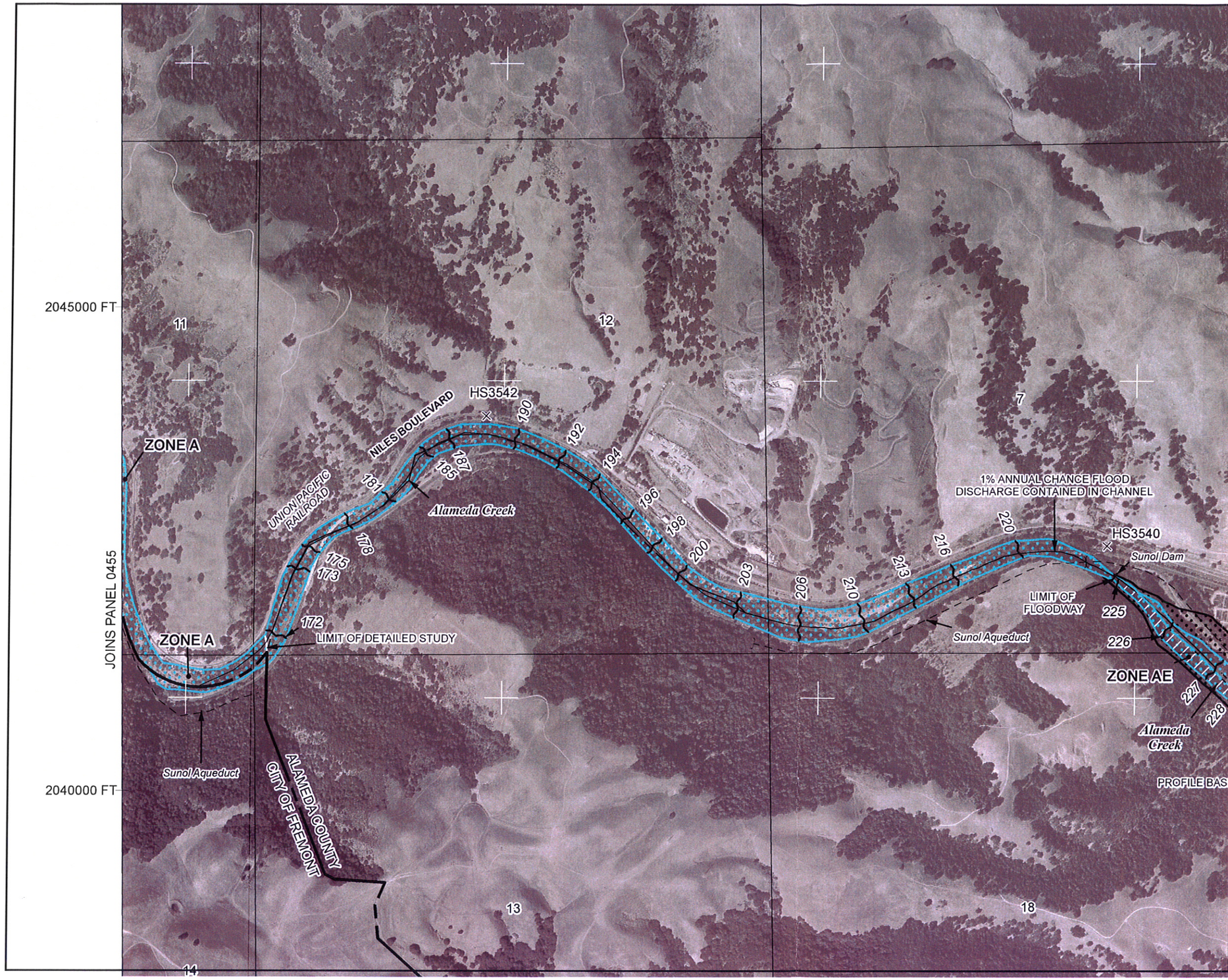
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06001C0455G

EFFECTIVE DATE
AUGUST 3, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0460G

FIRM

FLOOD INSURANCE RATE MAP

ALAMEDA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 460 OF 725
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALAMEDA COUNTY	060001	0460	G
FREMONT, CITY OF	065028	0460	G
PLEASANTON, CITY OF	060012	0460	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

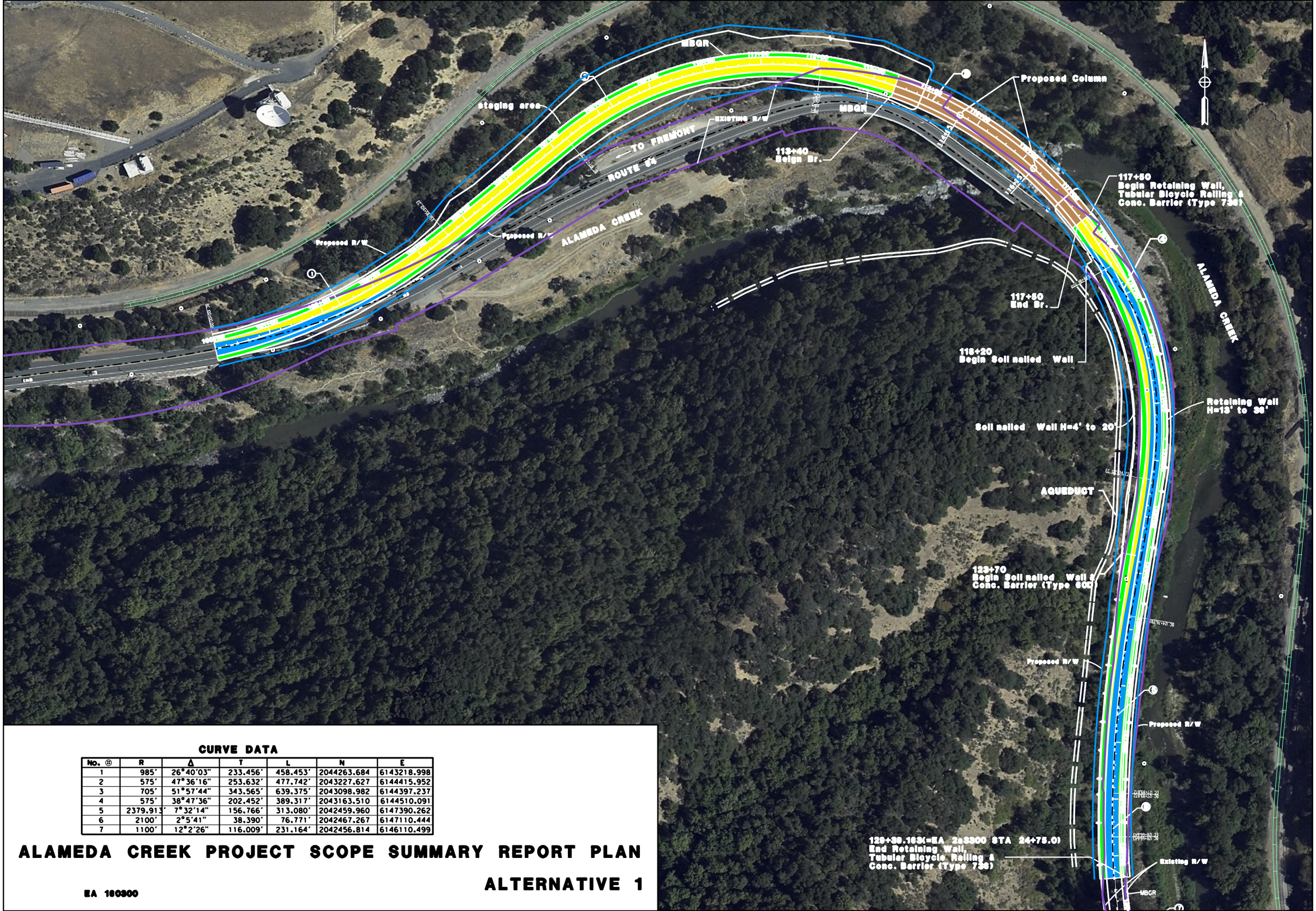
MAP NUMBER
06001C0460G

EFFECTIVE DATE
AUGUST 3, 2009

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix E: Build Alternative Designs



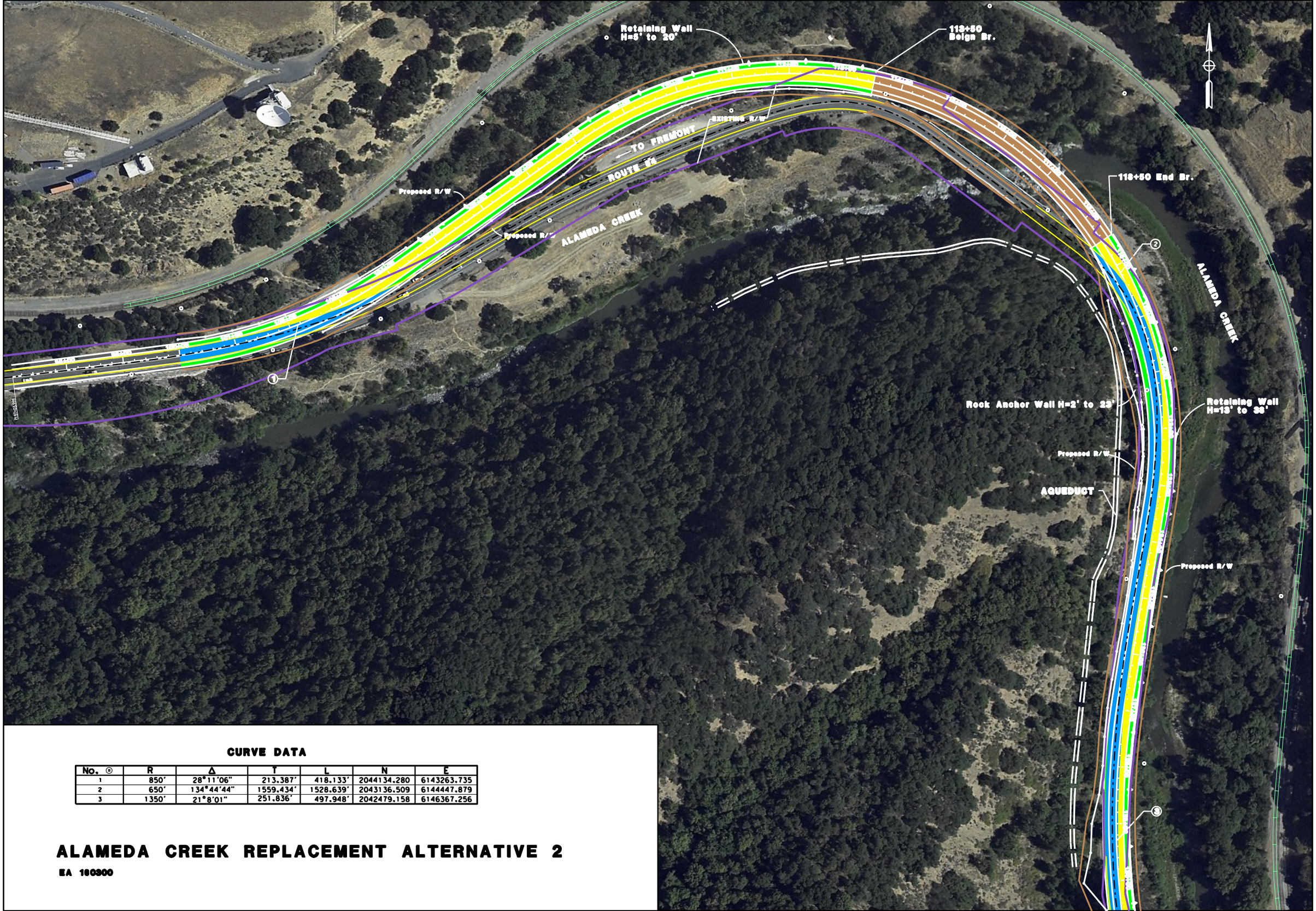
CURVE DATA

No. ⊕	R	Δ	T	L	N	E
1	985'	26°40'03"	233.456'	458.453'	2044263.684	6143218.998
2	575'	47°36'16"	253.632'	477.742'	2043227.627	6144415.952
3	705'	51°57'44"	343.565'	639.375'	2043098.982	6144397.237
4	575'	38°47'36"	202.452'	389.317'	2043163.510	6144510.091
5	2379.913'	7°32'14"	156.766'	313.080'	2042459.960	6147390.262
6	2100'	2°5'41"	38.390'	76.771'	2042467.267	6147110.444
7	1100'	12°2'26"	116.009'	231.164'	2042456.814	6146110.499

ALAMEDA CREEK PROJECT SCOPE SUMMARY REPORT PLAN

ALTERNATIVE 1

EA 160300

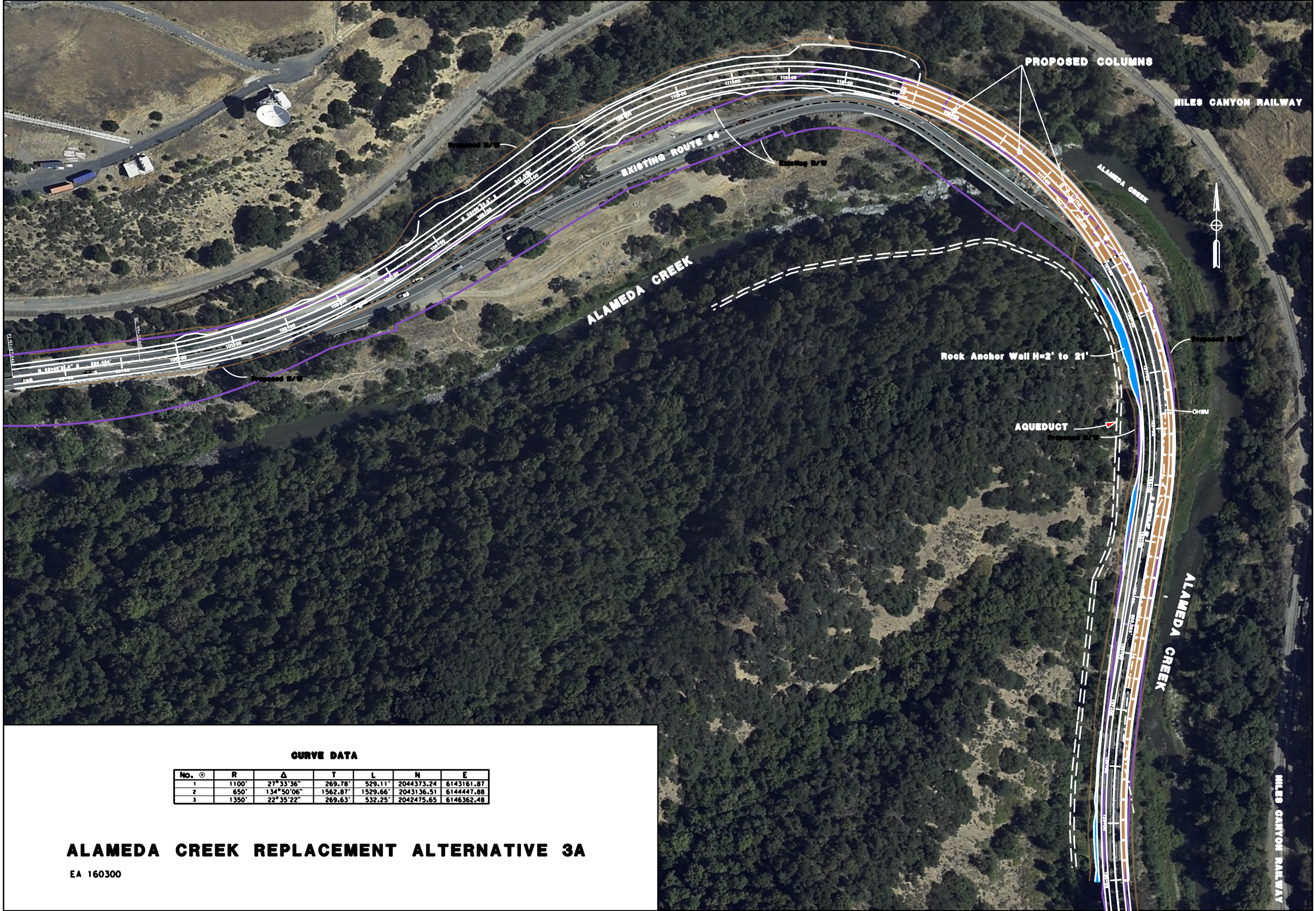


CURVE DATA

No. ⊛	R	Δ	T	L	N	E
1	850'	28°11'06"	213.387'	418.133'	2044134.280	6143263.735
2	650'	134°44'44"	1559.434'	1528.639'	2043136.509	6144447.879
3	1350'	21°8'01"	251.836'	497.948'	2042479.158	6146367.256

ALAMEDA CREEK REPLACEMENT ALTERNATIVE 2

EA 160300

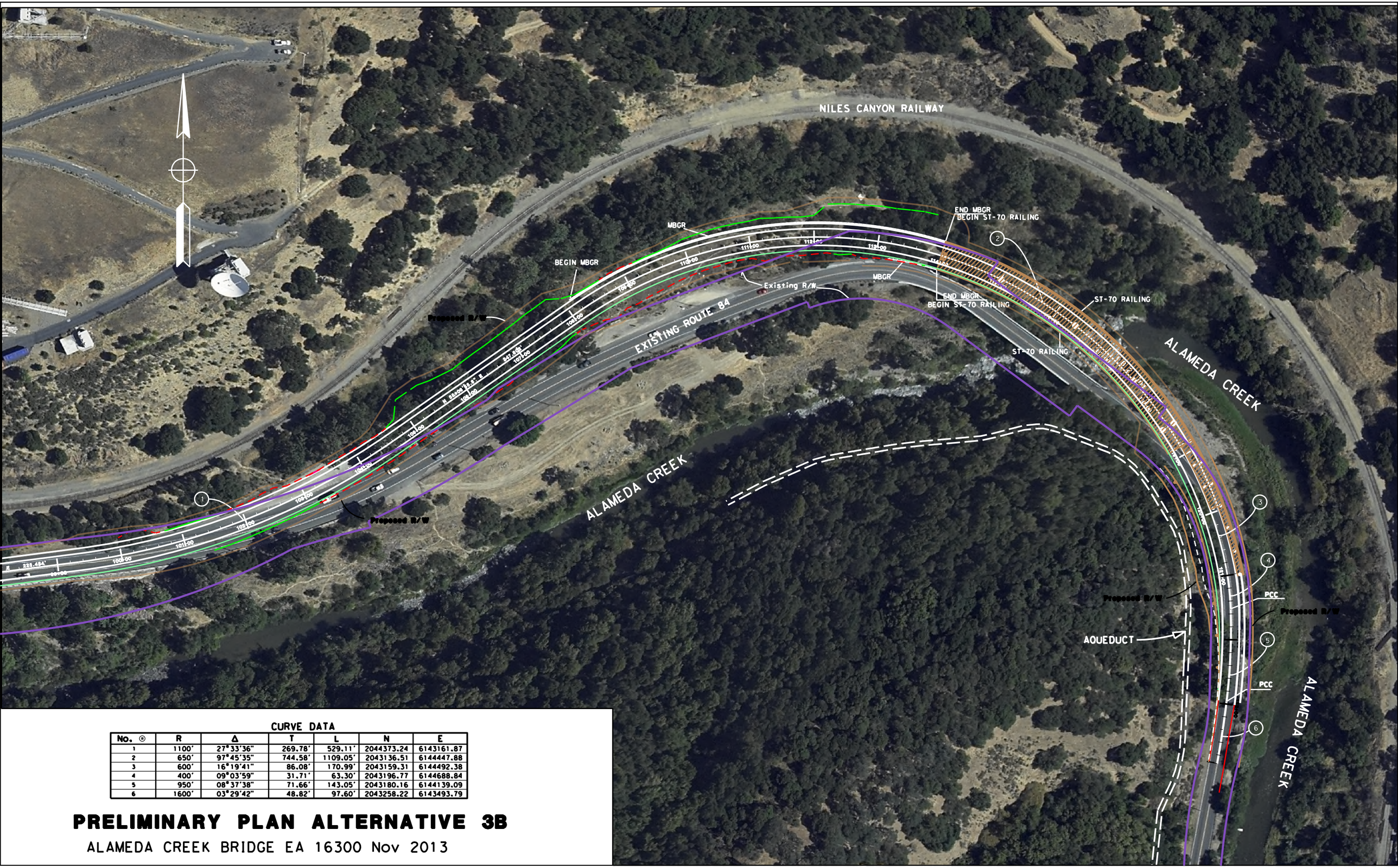


CURVE DATA

No. ⊙	R	Δ	T	L	N	E
1	1100'	27°33'36"	269.78'	529.11'	2044373.24	6143161.87
2	650'	134°50'06"	1562.87'	1529.66'	2043136.51	6144447.88
3	1350'	22°35'22"	269.63'	532.25'	2042475.65	6146362.48

ALAMEDA CREEK REPLACEMENT ALTERNATIVE 3A

EA 160300



CURVE DATA

No. ⊕	R	Δ	T	L	N	E
1	1100'	27°33'36"	269.78'	529.11'	2044373.24	6143161.87
2	650'	97°45'35"	744.58'	1109.05'	2043136.51	6144447.88
3	600'	16°19'41"	86.08'	170.99'	2043159.31	6144492.38
4	400'	09°03'59"	31.71'	63.30'	2043196.77	6144688.84
5	950'	08°37'38"	71.66'	143.05'	2043180.16	6144139.09
6	1600'	03°29'42"	48.82'	97.60'	2043258.22	6143493.79

PRELIMINARY PLAN ALTERNATIVE 3B

ALAMEDA CREEK BRIDGE EA 16300 Nov 2013