

**State Route 12 Shoulder Widening from Azevedo to
Liberty Island Roads, and Left Turn Pockets at Currie,
McCloskey and Azevedo Roads**

04-SOL-12, PM 20.6/21.3 and 22.6/23.7
Expenditure Authorization 2A6200
Project Number 04 0000 0832

**Initial Study with Mitigated
Negative Declaration (CEQA)**



Prepared by the State of California Department of Transportation

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.



September 2010

SCH Number: 2009022028
04-SOL-12, PM 20.6/21.3 and 22.7/23.7
EA 2A6200
Project Number 04 0000 0832

On State Route 12, Currie Road to Liberty Island Road
in Solano County

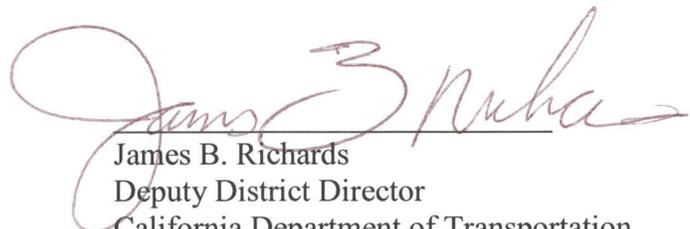
**INITIAL STUDY with
MITIGATED NEGATIVE DECLARATION (CEQA)**

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

Prepared by
THE STATE OF CALIFORNIA
Department of Transportation

08/31/10

Date of Approval



James B. Richards
Deputy District Director
California Department of Transportation

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General Information About This Document

What's in this document?

The California Department of Transportation has prepared this Initial Study –Mitigated Negative Declaration, which examines the potential environmental impacts for the proposed project located on SR 12 Currie Road to Liberty Island Road in Solano County. This document describes why the project is being proposed, the existing environment that could be affected by the project, and the proposed avoidance, minimization, and/or mitigation measures.

The Department received comments during the Draft Environmental Document comment period. Updates and changes in the text of the document have been marked with a vertical line in the right margin for clarification.

What happens after this?

Caltrans may (1) give environmental approval to the proposed project, (2) undertake additional environmental studies, or (3) abandon the project. If the project were given environmental approval and funding were appropriated, Caltrans could design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Howell Chan, Senior Environmental Planner, P.O. Box 23660, Mail Station 8-B, Oakland, CA 94623-0660; (510) 286-5623 Voice, or use the California Relay Service TTY number, (510) 286-4454.

Negative Declaration (CEQA)

Pursuant to: Division 13, Public Resources Code

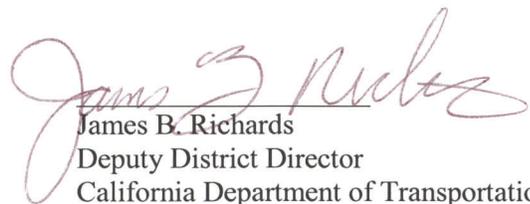
Project Description

The California Department of Transportation (Caltrans) proposes to provide standard eight-foot shoulders in both directions of State Route 12 from Azevedo Road to Liberty Island Road (PM 22.7/23.7), and to add left-turn pockets at Azevedo Road (PM22.7), McClosky Road (PM 21.3) and Currie Road (PM 20.6). This project also proposes to overlay the existing main line between Azevedo Road to Liberty Island Road with six inches of Hot Mix Asphalt, and to improve the vertical sight distances by adjusting the existing profiles at PM 21.3, PM 23.1, and PM 23.2.

Determination

The Department has prepared an Initial Study for this project, and following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

- The project will not significantly affect fish, plant life or wildlife; nor will it significantly affect any rare or endangered species.
- There will be no significant impacts upon the aesthetic features of the area.
- The project will not significantly affect any important farmland, any floodplain or any wetlands.
- No historic or archaeological sites or structures of architectural or engineering significance will be affected.
- The project will not affect neighborhoods, social, cultural, or educational facilities, or the economy of the area.
- The potential for geologic or seismic hazards will not be increased by the project.
- The project is compatible with local, regional and state land use planning and will not introduce any new patterns of land use or any growth in the area. It will not alter present patterns of traffic circulation or movement.
- There will be no impacts on noise, air, and water quality. The project will not change the rate of use for any natural resources.


James B. Richards
Deputy District Director
California Department of Transportation

08/31/10
Date

Summary

The California Department of Transportation proposes to upgrade State Route (SR) 12 to meet current Caltrans design standards. SR 12 is currently a two-lane highway that serves as the major east-west corridor connecting Napa, Sonoma, and Solano Counties and the San Joaquin Valley. This highway is also strategically located as the only east-west route connecting Solano County to the Sacramento and Stockton areas and, as such, handles a significant amount of interregional traffic. The existing shoulders are standard 8-foot wide in both directions between Currie Road (PM 20.6) and Azevedo Road (PM 22.7). From Azevedo Road (PM 22.7) to Liberty Island Road (PM 23.7), the existing roadway shoulders are less than the 8-foot standard width in both directions. However, there are no left-turn lanes at the three intersections of Currie Road (PM 20.6), McCloskey Road (PM 21.3), and Azevedo Road (PM 22.7).

No significant environmental impacts have been identified in technical studies prepared for the proposed project. Caltrans has used avoidance and minimization measures that reduce any potential project impacts to a level of insignificance. A Categorical Exclusion is being prepared for this project to satisfy the requirements under NEPA.

The alignment passes through land with potential biological resources. Protocol level surveys addressing potential impacts to listed species and critical habitat including vernal pools for listed species are completed. During construction near Well Creek Bridge, measures would be taken to avoid any impacts to nesting birds and aquatic wildlife in the waters below.

This project may affect the following federally listed species:

vernal pool fairy shrimp (*Branchinecta lynchiii*), vernal pool tadpole shrimp (*Lepidurus packardi*), Conservancy fairy shrimp (CFS; *Branchinecta conservatio*), California tiger salamander (*Ambystoma californiense*), Delta green ground beetle (*Elaphrus viridis*).

Additionally, the project may affect the following California state listed species:

Swainson's Hawk (*Buteo swainsonii*), Burrowing Owl (*Athene conicularia*), giant garter snake (*Thamnophis gigus*), California tiger salamander (*Ambystoma californiense*).

Permits required for this project include:

- California Department of Fish and Game (CDFG) Code 1602 Streambed Alteration Agreements

- Section 401 Water Quality Certification Permit
- US Army Corps of Engineers Section 404 Nationwide Permits 14 and 33
- US Fish and Wildlife Service (USFWS) Section 7 Consultation for Threatened and Endangered Species
- California Department of Fish and Game 2080.1 Consistency Determination

The project would require approximately 5.53 acres of additional right of way (R/W) in order to accommodate standard shoulders and profile adjustments. This R/W would be in the form of narrow “sliver” acquisitions from ranches engaged in agricultural practices along the length of the project. Agricultural land is protected from conversion by State and Federal laws. However, the land and soil are considered non-prime for intensive agriculture, and the amount of acquisition is small in relation to the amount of agricultural acreage in Solano County and the acreage of the adjacent ranches. Therefore, there would not be a significant agricultural impact.

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Chapter 1. Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) proposes to upgrade State Route (SR) 12 to meet current design standards. The proposed project will provide standard eight-foot shoulders in both directions of State Route 12 from Azevedo Road to Liberty Island Road (PM 22.7/23.7), and add left-turn pockets at Azevedo Road (PM 22.7), McCloskey Road (PM 21.3) and Currie Road (PM 20.6). This project also proposes to overlay the existing main line between Azevedo Road to Liberty Island Road with six inches of Hot Mix Asphalt, and to improve the vertical sight distances by adjusting the existing profiles at PM 21.3, PM 23.1, and PM 23.2.

Figures 1 and 2 at the end of this chapter show the project location and vicinity maps.

To accommodate the shoulder widening, the existing Well Creek Bridge (PM 22.9) and cross culverts will be extended/replaced and utilities relocated. In order to reduce environmental impacts along Well Creek, a retaining wall is proposed on the North side of the highway between PM 22.9 and 23.0.

This project is programmed under the Collision Reduction Program (Code 201.015) in the amount of \$11,088,000 (Construction \$9,116,000, R/W \$1,972,000) programmed for the fiscal year (FY) 2010/2011 in the 2008 State Highway Operation and Protection Program (SHOPP).

1.2 Background

State Route (SR) 12 is a two-lane conventional highway that serves as the only east-west route connecting Solano County to the Sacramento and Stockton areas. The existing shoulders are standard 8-foot wide in both directions between Currie Road (PM20.6) and Azevedo Road (PM 22.7). From Azevedo Road (PM 22.7) to Liberty Island Road (PM 23.7), the existing roadway shoulders are less than standard width in both directions. There are also no left-turn pockets at three intersections of Currie Road (PM 20.6), McCloskey Road (PM 21.3), and Azevedo Road (PM 22.7).

This strategically located highway is the only east-west route connecting Solano County to the Sacramento and Stockton areas, which handles a significant amount of interregional traffic. SR 12 serves as a major road to numerous tourist attractions in the

Sacramento Delta, the Sierra Nevada Mountain Range, and the Lake Tahoe area. Within the project limits, SR 12 carries a significant numbers of trucks and conveys traffic between Suisun City to the west and Rio Vista to the east. Both of these residential areas are experiencing high rates of growth. Accidents along this corridor have been severe, but occur less frequently on the average for roads with similar usage.

A Major Investment Study (MIS) conducted by Solano Transportation Authority (STA) was completed in October 2001, for the portion of Route 12 extending from Route 80 to the Sacramento River. The MIS identified potential existing and future transportation deficiencies and proposed appropriate phased remedies in the Study corridor. The MIS proposed both short-term and long-term recommendations (Year 2025). This project is consistent with the MIS recommendations to provide Safety Improvements along this section of the highway. The MIS can be viewed at the Solano County Transportation Authority website at Solanolinks.com.

The proposed project was also in the 2009 Tansportion Improvement Program (TIP) adopted by Federal Highways Administration (FHWA)/Federal Transportation Authority (FTA) on November 17,2008 (TIP ID MTC 050011).

1.3 Project Purpose and Need

The purpose of this project is to reduce accidents and minimize accident severity involving fixed objects, and provide a 'clear recovery zone' off the traveled way on State Route (SR) 12 between Azevedo Road (PM 22.7) and Liberty Island Road (PM 23.7) as a part of the Department's Collision Reduction Program. Under the Clean Up the Roadside Environment program (CURE), this project will remove trees that are in the clear recovery zone and widen the shoulder in both directions of Route 12.

Two roadway rehabilitation projects (EA 0T0900 and EA 0T1010) scheduled for construction in 2010 will provide standard shoulder widths from Currie Road to the west of the project limits. This project will correct the one-mile stretch of non-standard shoulder between Azevedo and Liberty Island Roads (PM 22.7/23.7) by providing standard eight-foot shoulder widths in both directions. Due to numerous accidents along the State Route 12 corridor, there is a need to provide left-turn pockets at all the intersections along this route. As a result, this project will also provide left-turn pockets at Currie Road (PM 20.6), McCloskey Road (PM 21.3), and Azevedo Road (PM 22.7).

This project is programmed for \$11,088,000 in the State Highway Operation and Protection Program (SHOPP) for the 2009/2010 fiscal year under program code 201.015. The estimated construction cost is \$9,116,000 and right of way is \$1,972,000.

1.4 Project Description

The Build Alternative for the proposed project will provide standard eight-foot shoulders in both directions of State Route 12 from Azevedo Road to Liberty Island Road (PM 22.7/23.7), and add left-turn pockets at Azevedo Road (P.M.22.7), McCloskey Road (PM 21.3) and Currie Road (PM 20.6). This project also proposes to overlay the existing main line between Azevedo Road to Liberty Island Road with six inches of Hot Mix Asphalt, and to improve the vertical sight distances by adjusting the existing profiles at PM 21.3, PM 23.1, and PM 23.2.

To accommodate the shoulder widening, the existing Well Creek Bridge (PM 21.9) and cross culverts will be extended/replaced and utilities within the right of way relocated. In order to reduce environmental impacts along Well Creek, an embankment confinement system designed to combat soil erosion is proposed on the north side of the highway between PM 22.9 and 23.0.

No Build

The No-Build Alternative would retain SR 12 in its current configuration.

1.5 Permits and Approval Needed

This project will require permits, agreements, and concurrence from resource agencies:

Table 1

Agency	Permit/Approval
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species, Biological Opinion
United States Army Corps of Engineers (USACE)	Section 404 Permit
California Department of Fish and Game (CDFG)	Section 1602 Agreement for Streambed Alteration Incidental Take Statement
State Water Resources Control Board (SWRCB)	Section 402 National Pollution Discharge Elimination System (NPDES)
Regional Water Quality Control Board (RWQCB)	Section 401 Permit

The following figures are attached at the end of this chapter: Azevedo Road to Liberty Island Road including left turn pockets at Azevedo, McClosky, and Curries Roads, Project Location and vicinity maps.



Figure 1. Project Vicinity

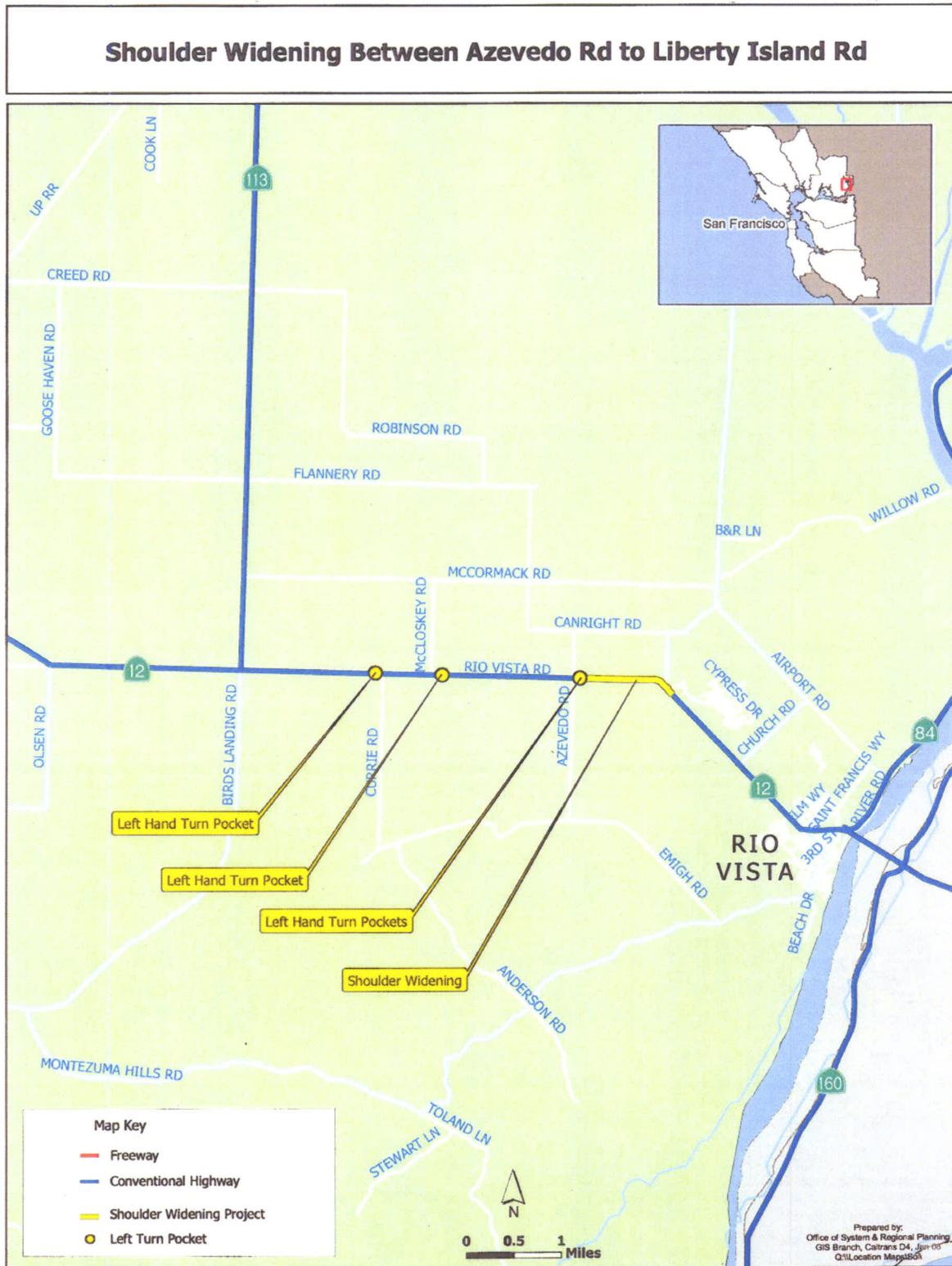


Figure 2. Project Location

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

This chapter describes the environmental resources of the project areas and how the resources would be affected by the proposed project. Potential environmental impacts of the proposed project, recommended avoidance and minimization measures are also discussed. Issues of concern pursuant to the California Environmental Quality Act (CEQA) will receive further discussion and provide the basis for responses to the CEQA Checklist form. Please see Appendix A for the CEQA Checklist.

Based on the results of technical studies that examined impacts to environmental resources, Caltrans determined that the appropriate level of CEQA determination for this project is an Initial Study/Mitigated Negative Declaration (IS/MND).

The appropriate level of NEPA determination is a Categorical Exclusion.

The word “significance” has been used in this document as a CEQA term. The proposed project would not significantly affect 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, 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. The mitigation measures identified and described in this document for the proposed project will minimize the impacts to the environment to a level below significance.

This Initial Study will not address the following issues and resources based on reviews by technical specialists in noise, geology, soils, air quality and from Professionally Qualified Staff (PQS) in cultural resources.

The Office of Cultural Resources Studies has performed a formal records search, reviewed Caltrans project files, the in-house Cultural Resource Database, and geomorphological data concerning the project area. An Archaeological Survey Report (ASR) and Historic Resources Evaluation Report (HRER) were prepared by Caltrans PQS. These studies satisfy Caltrans requirements in accordance with the January 1, 2004 Programmatic Agreement among the Federal Highway Administration, the

Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation (PA).

The ASR found that the stretch of State Route 12 between the post miles 20.6 and 23.7 is of very low cultural sensitivity. No archaeological resources were located within the project Area of Potential Effects (APE). The HRER recorded and evaluated three properties greater than 50 years in age within the APE and found that none of the properties were eligible for listing on the National Register of Historic Places.

Therefore, Caltrans has found and the State Historic Preservation Officer has concurred that the project has no potential to affect historic properties; and no further study is necessary. Cultural resources will not be addressed further in this Initial Study.

It is Caltrans' policy to avoid impacts to cultural resources whenever possible. Further cultural resources study may also be necessary if the proposed area of work, or work plan, is altered. Additionally, in the event that subsurface cultural resources are encountered during construction, Caltrans' policy requires that work be immediately halted in the area of the finds until a qualified archaeologist can evaluate them.

Cultural resources will not be addressed further in this Initial Study.

2.1 Human Environment

2.1.1 Land Use

Existing and Future Land Use

Solano County is a fast-growing region within the northern reaches of the San Francisco Bay Area. Regionally, SR 12 is a major east-west route to destinations such as Sacramento, San Francisco and the greater Bay Area, and provides a link to major freeways such as I-80 and I-5. SR 12 is a two-lane highway facility set in a rural landscape that is flat grassland to the west, and rolling hilly terrain to the east. There are few residential or commercial structures in or around the project area. This stretch of the highway is within unincorporated portions of Solano County. Agricultural land abut the right of way along both sides of the alignment. The agricultural use is primarily grazing of livestock. The land uses along SR 12 are zoned and projected to remain rural, agricultural, and unchanged.

This highway is strategically located as the only east-west route connecting Solano County to the Sacramento and Stockton areas, and as such, handles a significant amount

of interregional traffic. SR 12 is a major road to various tourist attractions in the Sacramento Delta, the Sierra Nevada Mountains, and the Lake Tahoe area. Within the project limits, SR 12 carries significant numbers of trucks and conveys traffic between Suisun City to the west and Rio Vista to the east. Both urban areas are experiencing high rates of growth. Accident levels are lower for SR 12 than the average for similar roads, but the nature of the accidents has been severe.

The long-range (20-year) concept for the highway, which is the Caltrans strategy for future improvements, is for a 4-lane expressway facility divided with limited access such as driveways or minor streets from Suisun City to Rio Vista. However, there are no capacity-increasing planned improvements to the SR 12 corridor within a 25-year planning horizon.

Consistency with Plans:

Transportation Plans and Programming

2009 Transportation Improvement Program

The proposed project was also in the 2009 Transportation Improvement Program (TIP) adopted by Federal Highway Administration (FHWA)/Federal Transportation Authority (FTA) on November 17, 2008 (TIP ID MTC 050011).

State Planning

The 1985 Route Concept Report identified the widening of Route 12 to four lanes from Suisun City to the Solano County/Sacramento County line.

A Major Investment Study (MIS) was completed in October 2001, for the portion of SR 12 extending from Route 80 to the Sacramento River. The MIS identified potential existing and future transportation deficiencies and proposed appropriate phased remedies in the Study corridor. As part of the MIS, both short-term and long-term recommendations (Year 2025) were proposed. This project is consistent with the MIS recommendations to provide Safety Improvements along this section of the highway.

Regional Plans

Delta Protection Commission Land Use and Resource Management Plan for the Primary Zone of the Delta

The project is consistent Delta Protection Commission Land Use and Resource Management Plan for the Primary Zone of the Delta. The proposed project has reviewed and considered the the policies and recomendations of the management plan including Environment, Utilities, Land Use, Recreation & Access, and Infrastructure.

(Draft) Solano Multi-Species Habitat Conservation Plan (HCP)/Natural Community Conservation Plan (NCCP):

The HCP/NCCP's area consists of all of Solano County as well as 7,670 acres of Yolo County. The HCP/NCCP covers the protection of seventy-seven species throughout the Plan's area. The SR 12 Azevedo Road to Liberty Island Road and left-turn pockets at Azevedo Road, McClosky Road, and Currie Road is within an area of Solano County that is considered the Montazuma Hills. As the federal action agency for the proposed project, Caltrans may use the draft HCP/NCCP as guidelines for assessing the effects of proposed actions, but is not legally required to comply with the measures identified in the HCP/NCCP.

General and Community Plans:

Solano County General Plan

The proposed project would not change any existing land uses. The project is consistent with the Solano County General Plan.

Coastal Zone and Wild and Scenic Rivers

The entire project area is outside of coastal zones. There are no wild and scenic rivers that traverse the project area.

Parks and Recreation

There are no publicly-owned parks, recreation areas, or wildlife or waterfowl refuges that border or are near the project area. No historic sites exist within the project area.

2.1.2 Growth

Regulatory Setting

The California Environmental Quality Act (CEQA) requires the analysis of a project's potential to induce growth. CEQA guidelines, Section 15126.2(d), require that environmental documents "...discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment..."

Affected Environment

This portion of the corridor connects recreational and commercial areas, and rural, agricultural communities to urban areas for distribution of agricultural products. The SR 12 corridor provides an important linkage to SR 113, I-80, and I-5; further to the west, it provides access to US-101.

This project does not increase the traffic capacity of the highway facility, but instead enhances its safety and efficiency. Therefore, it would not have any impact on the growth of the area or the community.

Employment Projections and Jobs/Housing Balance

In 2005, there were 148,640 jobs and 194,900 employed residents in Solano County for a jobs deficit of 46,260 jobs.

Job growth forecasts for Solano County predict increases of 47% to the Solano County employment base from 2005-2030. A projected 38% increase in employed residents ensures no significant improvements to the present imbalance between continuing jobs/housing. The jobs deficit is projected to increase to 51,890 by 2030. Growth in jobs is projected to be 47% with a 38% growth in employed residents. See table 2 on the following page.

To summarize, the rate of growth in Solano county jobs is expected to be slightly greater than the growth among county residents, but the improvement in the jobs/housing imbalance is negligible compared with the existing jobs deficit. For the foreseeable future, numerous Solano County residents will be required to commute to jobs elsewhere in the Bay Area. As another indicator of this jobs/housing imbalance, Solano County today contains the greatest proportion of long-distance commuters (more than 45 minutes each way) among the nine Bay Area counties.

These predicted employment increases may mitigate the housing growth within each county, but all projections emphasize continued demand for travel to local and regional jobs and for regional shopping needs. A significant number of in-county jobs in each of these outlying Bay Area counties are low-wage positions in the retail and service industries that require residents to travel out-of-county for employment.

Impact

There will be no adverse impacts as a result of the proposed project.

Table 2

Population, Housing and Employment Growth

in the Greater Project Region: 2005-2030. (from ABAG)

Geographic Area	Population			Households			Employment (Jobs)		
	2005	2030	% change	2005	2030	% change	2005	2030	% change
Solano County	423,800	581,800	37	141,100	193,840	37	148,640	217,910	47
Fairfield	106,600	147,500	38	34,490	47,850	39	49,960	74,120	48
Suisun City	28,500	38,600	35	8,760	11,770	34	4,060	6,890	70
Vacaville	97,500	127,100	30	31,350	41,350	32	30,350	45,920	51

2.1.3 Farmlands/Agricultural Lands

Regulatory Setting

The California Environmental Quality Act requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

Affected Environment

The project proposes to acquire land from private owners for additional right of way along SR 12. The acquisition of additional right of way is proposed in order to widen the shoulder to standard width, to replace the existing longitudinal side ditches, and to relocate existing utility installations. Additional right of way acquisitions are in the

form of narrow parcel strips –slivers– along SR 12 within the project limits. The proposed project would require fifteen partial acquisitions in which ten of the parcels are pasture, dry irrigation crop lands, one is agricultural with a residence and four are industrial. This may affect several of the following properties with active Williamson Act Contracts. APN# 0048-100-570, 0048-100-560, 0048-100-440, 0048-100-420, and 0048-110-230.

Impact

The Williamson Act of 1965 is the principal implementation of the state of California's policy for the preservation of agricultural land including prime, non-prime and grazing lands.

According to CEQA guidelines, any farmland under this Act shall be evaluated for proposed future land use in coordination with the California Department of Conservation (CDC). There will be no significant impact from the project on agricultural production, because each right-of-way acquisition for this project is on the periphery of the agricultural properties. Therefore, no significant acreage of farmland will become non-farmable due to interference with land patterns.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation for farmland is proposed for the project at this time.

2.1.4 Community Impacts

Regulatory Setting

Under the California Environmental Quality Act, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Affected Environment

This stretch of SR 12 links northbound SR 113 and is an important east-west link for motorists traveling between the Fairfield/Suisun City area and Rio Vista. These towns are destinations as well as transportation hubs for commuters using mass transit. SR 12

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serves as an interregional, recreational, commercial, agricultural, and commuter route. It provides an important link to interstate truck routes including US-101, I-80 and I-5. The highway serves as a route for long-distance recreational bicycle travel.

Impact

The proposed project would not divide the community or require any relocations. The proposed project would not adversely result in adverse impacts on population growth/sprawl, local economy, municipal or community services, utility services, community character, or existing and proposed land uses.

2.1.5 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For year 2007, this was \$20,650 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

Impacts

The proposed project would not require any residential or business relocations. The widened road would be within an existing, highway corridor. Although the new median barrier would create a minor impact to traffic circulation, the project would not constitute any new physical or psychological barriers that would divide, disrupt or isolate neighborhoods in the corridor. The proposed improvements would require both temporary and permanent sliver acquisitions affecting private property. Existing parking would not be affected. Private driveways that are affected due to the roadway widening will be realigned where needed.

Based on the above discussion and analysis, the build alternative will not cause disproportionately high and adverse effects on any minority or low-income populations as per E.O. 12898 regarding environmental justice.

2.1.6 Utility/Emergency Services

Affected Environment

The first utility verification request was sent to the Utility owners on November 06, 2006 for mappings within the original project limit between Azevedo Road (PM 22.7) and Liberty Island Road (PM 23.7). PG&E and Frontier Communications sent their mappings within this limit to Caltrans for verification. Another request for utility verification was sent to the Utility owners on September 24, 2007 for the additional project limits between Currie Road (PM 20.6) and Azevedo Road (PM 22.7). The utility owners later responded that there are no utilities within the project limits. However, field verification indicated that there are some utilities near the Azevedo Road and Currie Road intersections. Verification of underground utilities was performed on January 14, 2009 by potholing at the intersection of the SR 12 and Azevedo Road. There are three underground utility lines owned and operated by other agencies. Two cable lines owned by Frontier Communications run parallel on each side of Azevedo Road and a fiber optics line owned by Level 3 Communications crossing SR12 at Azevedo Road. In addition, there two high risk gas lines crossing under SR12 with approximately 4 to 5 feet in depth just east of Azevedo Road. The potholing performed indicated that they are encased. Caltrans will coordinate with the utility companies for any necessary utility relocation or protection during construction early in the design phase.

Additional right of way is anticipated for relocation of the utility poles. There are approximately 50 utility poles identified to be relocated to new locations along the proposed right of way line within the project limits.

Impacts

During construction, standard Caltrans signage would be employed to clearly identify temporary detours in the project area to direct traffic including law enforcement, fire, and other emergency services. Power pole relocation would not affect the capacity or coverage of electrical or telephone service. There would most likely be minor inconveniences during the relocation of utility poles or other related structures. However, these would be both temporary and of short duration.

2.1.7 Traffic/Transportation/Pedestrian/Bicycle Facilities

Regulatory Setting

The Department is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

Affected Environment

SR 12 is the major east-west regional corridor linking the residential housing of Solano County with local and regional employment areas, and tourism in Napa County. The area is rural in character and the highway carries little pedestrian or bicycle traffic.

The 2004 Traffic Volumes on California State Highways publication indicates an Annual Average Daily Traffic (AADT) of 16,700 vehicles and is projected to increase demand to 32,000 vehicles by the year 2020 for this segment of SR 12. Table 3 shows the traffic data projections for the proposed project on SR 12 between Azevedo Road and Liberty Island Road. Average Daily traffic (ADT), Traffic Index (TI) a measure of the amount of punishment by weight that a roadway will be subject to over the design life period, and the percentage of truck traffic are represented below.

Table 3

Year	ADT	TI (mainline)	TI (shoulder)	Truck %
2007	22500			
2022	35200	11.5	7	8.9
2032	43700	12.5	8	8.9

Reducing accidents and minimizing accident severity involving fixed objects along SR 12 is the purpose of this project. Traffic and accident analysis shows that there is a need to reduce the number and severity of the accidents in the project location.

The following is a summary of the Traffic Accident Surveillance Analysis System (TASAS) accident data on SR 12, between Currie Road and Liberty Island Road for the three-year period from July 1, 2004 to June 30, 2007. There were a total of twenty four accidents, including one-fatal, nine-injury and fourteen-property damage only accidents.

The number of accidents per million vehicle miles and the accident types are shown in Table 4.

Table 4

	FATAL	FATAL + INJURY	TOTAL
Actual	0.016	0.16	0.38
Statewide Average	0.030	0.41	0.82

The twenty-four total accidents fall into the following collision type categories:

<u>No. of Accidents</u>	<u>Type of Collision</u>
4 (16.7%)	Head-On
5 (20.8%)	Sideswipe
6 (25.0%)	Rear End
1 (4.2%)	Broadside
6 (25.0%)	Hit Object
2 (8.4%)	Other

Impacts

A Transportation Management Plan (TMP) will be required for this project. The Transportation Management Plan is a special program that will be implemented during construction to minimize and prevent delay and inconvenience to the traveling public. The TMP will include press releases to notify and inform motorists, business,

community groups, local entities, and emergency services of upcoming closures. Various TMP elements such as portable changeable message signs and CHP Construction Zone Enhanced Enforcements Program (COZEEP) will be utilized to alleviate and minimize delay to the traveling public.

There may be temporary effects to the use of the facility by bicyclists during construction; due to project staging, those effects are believed to be of minor significance and of short duration. During construction, bicyclists may be routed to the opposite side of the highway as needed. Widening shoulders within the project limits would allow bicyclists to maintain safer distances from motorized vehicular traffic.

2.1.8 Visual/Aesthetics

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 Section 21001(b)]

Affected Environment

Landscape in the area is rural environment consisting of open farmlands and ranchettes located along rolling grassy hills. The Caltrans Scenic Highway Program states that SR 12 within project limits is ineligible for scenic highway status.

Impact

The project is in compliance with the Solano County General Plan. Project activities would not remove or separate any key feature or characteristic important to nearby or distant vistas. There are no scenic resources such as unique or outstanding trees, rock outcroppings, historic buildings or other structures, that would be adversely affected by the proposed project. Removal of roadside vegetation would not significantly affect the visual quality of the environment.

Proper erosion control measures pursuant to best management practices (BMPs) would be implemented by Caltrans. Embankments and excavated slopes would be revegetated with erosion-control grasses compatible with the adjacent seasonal grasses. Proposed embankments and excavated slopes would not be out of character in the appearance of the surrounding area.

There are approximately 44 trees (35 Juglans, 7 Eucalyptus and 2 Platanus) that will be removed within the current right of way alignments including. The removal of these trees requires no mitigation. However, replacement tree planting on adjacent properties will be encouraged.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Affected Environment

Drainage facilities will be installed and upgraded and existing longitudinal ditches will be re-established along the limits of the project. The major drainage works include the replacement of five culverts and the extension of four other culverts.

In order to minimize the environmental impact and avoid filling into the Well Creek, a sheet pile of 500 feet in length will be constructed. The sheet pile will be mechanically driven or vibrated into the existing ground along the top of the creek bank in the westbound direction, it will be terminated about two feet longitudinally prior to a proposed extended reinforced concrete box.

Impacts

The drainage pattern of the existing facility would not change because it meets standard Caltrans criteria and guidelines for the design of drainage facilities. A portion of the project area is within the 100 Year Floodplain; the area subject to 100-year floods roughly corresponding to Well Creek. The proposed project does not result in new footings or structures in the 100 Year Floodplain and will not decrease floodplain values. Please see appendix G for a copy of the floodplain Encroachment report.

2.2.2 Water Quality and Storm Water Runoff

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NPDES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional

Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California’s Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are 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 controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish 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, water pollution control, and water quality functions throughout the state. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **NPDES Program**

The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department 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 describes the minimum procedures and practices the Department 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 Best Management Practices (BMPs). The proposed Project will be programmed to follow the guidelines and procedures outlined in the 2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

- **Municipal Separate Storm Sewer System Program**

The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) 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 are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

- **Construction Activity Permitting**

Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)". Construction General Permit (Order No. 2009-

009-DWQ, adopted on September 2, 2009, will become effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a DSA of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1 – 3. 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. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP).

Project must comply with Construction General Permit (CGP) adapted on September 2, 2009. All SWPPP Projects with more than 1 acre of Disturbed Soil Area (DSA) are required to perform sediment risk assessment, file Notice of intent and file Permit Registration Document. For risk level 2 & 3 projects the contractor must prepare annual report & rain event action plans and perform sampling & analysis for PH, turbidity for risk level 2 and PH, turbidity and suspended sediment concentration for risk level 3. Risk level one only requires annual report. A Water Pollution Control Plan (WPCP) is used for projects with less than 1 acre of DSA.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

Affected Environment

The project is located in the Valley-Putah Cache Elmira hydrologic area (HA 511.10), which receives 18.4 inches of annual rainfall in 195,399 acres of watershed. The climate in the area is of Mediterranean in character with dry warm summers and wet cool winters. Rainy season is from the period October 15 up to April 15. SR 12 project

elevation limits are 79 feet on the west end (Azevedo Road) and slopes down to 48 feet one mile at the eastern limit (Liberty Island Road) of the project.

Runoff from the western portion of the project flows northeasterly to the Big Ditch and Lindsey Slough part of the Sacramento River. The eastern portion flows to the Sacramento River, about 3 miles southeast of the project. Sacramento River is part of the Delta Waterways and its tributary Lindsay Slough is about 4 miles north of the project. Well Creek, a seasonal stream crosses under SR 12 at PM 22.91.

The project will disturb about 5.2 acres of soil and increase the net added impervious area by 1.9 acres. Temporary impacts will be minimized through the use of Construction Site BMP measures and erosion control. Permanent impacts will be minimize by permanent treatment BMPs and design pollution control BMPs discussed below. Treatment BMPs will be incorporated into the project to the maximum extent practicable.

There are no identified high-risk areas in the vicinity. High-risk areas are locations where spills from department owned right-of-ways, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or ground water percolation facilities.

Ground Water

The project lies in the Solano Subbasin of the Sacramento Valley Solano Groundwater Basin 5-21.66. In 1941, groundwater levels declined due to increasing agricultural and urban development, reaching their lowest historical levels in the late 1950s.

A large pumping depression between Davis and Dixon was one of the more notable groundwater level depressions in the subbasin. Surface water deliveries beginning in 1959 caused groundwater levels to rise slightly or slow their descent. Since this time, groundwater level trends within the Solano subbasin have been affected by drought periods in the mid-1970s and late-1980s but have recovered quickly in the following “wet” years.

General hydrologic classification of soils is predominantly Diablo Ayar clays followed by a small percentage of Antioch-San Ysidro complex and Rincon clay loam mainly belonging to hydrologic group D of very slow infiltration and high runoff potential. Rainfall intensity measured in terms of runoff rate in the Central Valley Region is 0.16 inches per hour. Potential groundwater contamination is low for work limited to widening the shoulder. In sites where excavation will be required such as culverts,

ditches and drainages, groundwater depth will have to be investigated especially close to surrounding wetlands.

Avoidance, Minimization or Mitigation.

Caltrans NPDES Permit Order No. 99-06 specifies construction activities with soil disturbance of one acre or more to document water pollution control practices through an effective Storm Water Pollution Prevention Plan (SWPPP). For Caltrans projects with less than an acre of disturbed soil area (DSA), a Water Pollution Control Program (WPCP) is prepared. Peak flow rates, runoff velocities, and erosive characteristics of the soils in the area are assessed with regard to downstream watercourses to determine potential impacts. Development of a SWPPP may be required for projects with less than one acre DSA if it is determined that a project possesses significant water quality risk such as work within or above a waterbody. This project has over an acre of soil disturbance and has work above a waterbody; hence, it will require a SWPPP.

Best Management Practices (BMPs) are implemented to protect water quality and reduce potential for pollution associated with storm water runoff. A BMP is any program, technology, process, siting criteria, operating method, or device that controls, prevents, removes, or reduces pollution.

Design Pollution Prevention BMPs

Permanent water quality controls are used to reduce pollutant discharges by preventing erosion. These BMPs are standard technology-based, non-treatment controls selected to reduce pollutant discharges to the maximum extent practicable (MEP) requirements. They apply to all projects. This category of BMPs includes preservation of existing vegetation; concentrated flow conveyance systems, such as ditches, berms, dikes, swales, overside drains, outlet protection/velocity dissipation devices; and slope/surface protection systems such as vegetated surfaces and hard surfaces.

Construction site BMPs

Temporary controls used to reduce pollutant discharges during construction. These controls are best conventional technology/best available technology (BCT/BAT) based BMPs that may include soil stabilization, sediment control, wind erosion control, tracking control, non-storm water management and waste management.

Treatment BMPs

Treatment BMPs are permanent water quality controls used to remove pollutants from storm water runoff prior to being discharged from Caltrans right-of-way. These controls will be used on the project to meet MEP requirements. This category of BMPs includes

traction sand traps, infiltration basins, detention devices, biofiltration strips/swales, dry weather flow diversion, and Gross Solid Removal Devices (GSRDs).

Use of appropriate BMPs, their specific sites, quantities and specifications will be separately documented as the project advances and more data becomes available at each phase.

2.2.3 Hazardous Waste/ Materials

Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

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

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety & 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 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

Affected Environment

An Environmental Assessment was completed in April 2007. There are no visual indications of any sources of hazardous materials/wastes such as chemical containers, or use of the project area for waste disposal. There are no industrial facilities, gas stations, or other potential generators of hazardous waste and materials in the surrounding area, which is undeveloped and rural. A site investigation report completed in December 1998 in Solano County at the SR 12/113 interchange (PM 10.8) indicates that there are lead concentrations within the corridor below the regulatory thresholds.

Impacts

If test results for aerially deposited lead reveal that the lead present in the soil is typically low and is not at a hazardous level, the soil can be reused at the project location and surrounding area without restriction. The Caltrans special provision for health and safety would be implemented before any reuse of the soil. Soil testing shall be conducted during the design phase of the project to confirm levels of lead concentration. However, there are no hazardous waste issues currently based on the latest Environmental Assessment.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation is currently proposed.

2.3 Biological Environment

2.3.1 Natural Communities

Regulatory Setting

This section discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors 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 are discussed below in the Threatened and Endangered Species section 2.3.5. Wetlands and other waters are also discussed below in the following section 2.3.2. A full species list is provided in Appendix F.

Affected Environment

Topographically the project is composed of rolling, hilly terrain that is part of the Montezuma Hills. This grassland region is transversed by seasonal creeks and swales. Wildlife species that occupy the project area include invertebrates, fish, amphibians, reptiles, birds, and small mammals.

This section of the environmental document addresses the concerns surrounding plant and animal species, special-status species, regulated habitats and wetlands and Waters of the United States. as they relate to the proposed project. This project may affect three federally listed vernal pool large branchiopod species including the endangered Conservancy fairy shrimp (CFS; *Branchinecta conservatio*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and endangered vernal pool tadpole shrimp (*Lepidurus packardi*), California tiger salamander (*Ambystoma californience*), as well as the Delta green ground beetle (*Elaphrus viridis*). Additionally, the project may affect the California-listed *species* threatened Swainson's hawk (*Buteo swainsonii*), the burrowing owl (*Athene conicularia*), the California tiger salamander (*Ambystoma californience*), and giant garter snake (*Thanmophis gigus*). The proposed project would affect wetlands, and other waters occurring within the area.

All permanently and temporarily affected areas provided in this analysis are based upon preliminary design data. Permanent impacts include the potential loss of unverified or potential wetlands, and other waters. Permanent impacts also include the estimated loss of approximately 44 trees.

Caltrans will seek nearby offsite mitigation for permanent loss of habitat through the purchase of appropriate habitat or mitigation bank credits. Caltrans will participate in the preservation and restoration of habitat necessary to compensate for impacts to federally-listed species pending approval of participating agencies.

2.3.2 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under several laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States 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 Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can 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. U. S. Army Corps of Engineers (USACE) manages the Section 404 permit program with oversight by the U. S. Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, 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 California Department of Fish and Game (CDFG) and the Central Valley Regional Water Quality Control Board (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the Fish and Game Code 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 CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG 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 CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

Affected Environments

Wetlands

In very general terms, waters of the United States are features within which water flows or ponds, such as creeks, rivers, and streams and their tributaries, or oceans, bays, or ponds, and that lack vegetation.

Wetlands and other waters of the U.S. are distributed occasionally throughout the project as depressional swales or ditches or in hillside seeps in areas underlain by a restrictive soil layer that results in a seasonally-perched water table.

Wetland community types present vary considerably along the project study area, and include: riparian, seasonal (ephemeral pool), perennial (marsh), ponds, and ditches and intermittent drainages, many of which function to convey roadside runoff. Some of these features support hydrophytic (wetland) vegetation and are referred to as wetlands. Vegetation associated with seasonal wetlands is variable depending on the duration of inundation. Species generally associated with short duration ponding include Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), curly dock (*Rumex crispus*), Harding grass (*Phalaris aquatica*), bristly ox-tongue (*Picris echioides*), and Italian ryegrass. In areas subject to prolonged inundation, associated species include semaphore grass (*Pleuropogon californicus*), tall cyperus (*Cyperus eragrostis*), broad-leaved cattail (*Typha latifolia*), and hardstem bulrush (*Scirpus actutus*).

Waters of the U. S.

Hydrology in the BSA is dominated by one perennial creek that is mapped on USGS maps: (Well Creek, Solano County). Runoff from the western portion of the project flows northeasterly to the Big Ditch and Lindsey Slough, which are part of the Sacramento River. The eastern portion flows to the Sacramento River, about 3 miles southeast of the project. Sacramento River is part of the Delta Waterways and its tributary Lindsey Slough is about 4 miles north of the project.

Impacts

The exact amount of wetlands will not be definitively known until the USACE (San Francisco District) verifies the wetland delineation and makes a determination on the limit of their jurisdiction. It is likely that any USACE non-jurisdictional wetlands and other waters features would be regulated by the RWQCB under the Porter-Cologne Act.

Due to access constraints, the total amount of seasonal wetland and other waters within the BSA is likely to change as more access to the study area is available. Most likely, the amount of wetland and other waters present within the BSA would be expected to decrease as the wetland delineation is refined.

A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for this project for Section 404 permit actions; this 401 certification or waiver is issued by the RWQCB. Current assessment project impacts to potential wetlands will require the issuance of a section 404 of the CWA Nationwide Permit from the USACE.

Avoidance, Minimization and/or Mitigation Measures

All feasible and practical measures will be undertaken to avoid or minimize impacts to seasonal wetlands and other waters during construction. These measures are described below.

- Wetland assessments will be conducted in parcels for which access can be obtained. In order to investigate additional areas, aerial photography, parcel maps, and assisted visual observation methods will be used to refine delineations where direct property access was not obtained to reduce the potential amount of impact. Wetland delineations conducted by Caltrans will be verified by USACE prior to project construction as part of the USACE jurisdictional determination.
- To the maximum extent practicable, all construction activities in the temporary work area will avoid wetlands and other waters of the U.S. All wetlands and waters within the temporary work area will be designated as an Environmentally Sensitive Area (ESA) and protected with appropriate fencing and signage. All ESAs will be shown on the final construction drawings.
- All work will be performed in accordance with a SWPPP. Also, BMPs to prevent erosion into onsite or offsite waters of the U.S., (including wetlands) will be implemented and may include the use of silt fences, sandbags, detention basins, and other means as appropriate.
- The topography and grade will be restored to preconstruction conditions in wetland and other waters areas that are temporarily affected. Following all grading and earthwork, these areas will be either be replanted or reseeded with the appropriate

plant species if determined necessary, or monitored following construction to determine that vegetation comparable to the pre-existing condition has naturally regenerated.

- To minimize the potential for onsite or offsite erosion into other wetland features, on-site roadside ditch wetland or other waters creation will occur prior to project completion and will be completed prior to the beginning of the wet season (typically October 31st).
- Standard erosion control measures (BMP) and the preparation of a SWPPP will be required of the contractor and implemented during construction to ensure that sedimentation into adjacent wetlands and other waters does not occur and indirectly impact adjacent resources. Monitoring of erosion control measures will be conducted during construction and remedied if found insufficient.

Unavoidable wetland and other waters losses estimated to occur once additional wetland investigations are performed or that occur during construction will be tallied and incorporated into project permits and compensatory mitigation documents and requirements as appropriate. Compensatory mitigation is described below.

In cases where impacts to wetlands and other waters are unavoidable, Caltrans will mitigate impacts to a less than significant level through wetland preservation and/or creation at an approved ratio as determined during the permitting process by the USACE and the RWQCB.

Creation of wetland and other waters habitat will be accomplished through steps outlined in a Conceptual Wetland Restoration Plan that will be prepared and submitted in support of obtaining the project permits, agreements, waivers, or approvals from the USACE, CDFG, and RWQCB.

The Conceptual Wetland and Other Waters Creation Plan will follow guidelines established by the USACE. A discussion of the annual reporting requirement, a monitoring plan, and remedial measures will be included in the plan, should monitoring determine that success criteria are not being achieved. The Caltrans District 4 Office of Biological Sciences and Permits will plan and implement any mitigation, in conjunction with the Caltrans District 4 Office of Landscape Architecture.

Compensatory mitigation could also be accomplished by purchasing mitigation credits at a wetland mitigation bank that services Solano and Napa Counties. Currently, there are several USFWS approved active mitigation banks that service Solano and Napa Counties.

The mitigation ratio for the creation of wetland resources will be from between 1:1 to 3:1 (mitigation to impact) on an acreage basis, off-site. The exact mitigation ratio (acreage basis) will be dependent on the type and habitat quality of the wetlands and other waters adversely affected, the quantity and location of adversely affected wetlands resources, the location of the proposed creation, and the outcome of agency discussions.

With the implementation of the above measures, impacts to wetlands and other waters will be reduced to a less than significant level.

Cumulative Impacts

Impacts to wetlands and other waters occurring as a result of the proposed project will also be less than significant after mitigation is implemented. No significant cumulative impacts are anticipated to occur to wetland resources from the SR 12 shoulder widening. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to wetland resources and the incremental effect is not expected to be cumulatively considerable.

2.3.3 Plant Species

Regulatory Setting

The United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share 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 afforded 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 the Threatened and Endangered Species Section 2.3.4 in this document for detailed information regarding these species.

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

The regulatory requirements for FESA can be found at Title 16 United States Code (USC), Section 1531, et. seq. See also 50 CFR Part 402. The regulatory requirements

for CESA can be found at California Fish and Game Code, Section 2050, et. seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, Public Resources Code, Sections 2100-21177.

Vegetation Community

Although federally listed plant species inhabit the project area as well as unique or special plant communities, the existing right-of-way has largely ruderal vegetation with little habitat value. Four vegetation associations typify the biological study area:

Roadside Ruderal Vegetation: Exotic annual grasses and weeds dominate the roadside ruderal vegetation in the existing right-of-way. There is no habitat value to this vegetation, which is subject to normal roadway maintenance.

Roadside Wetlands: The roadside wetlands include: waters associated with highway runoff, natural drainages, seeps, swales, and pools that are intercepted by the highway banks and culverts. The majority of the plants are obligate or facultative native plants. The most common native plants include nutsedge (*Cyperus eragrostis*), common spike rush (*Eleocharis macrostachya*), alkali heath (*Frankenia salina*), button celery (*Eryngium aristulatum*), Baltic rush (*Juncus balticus*), toad rush (*J. bufonius*), meadow barley (*Hordeum brachyantherum*). A unique wetland vegetation association is found in cultivated swales along the fence lines. These areas are maintained for fire protection and have common native vernal pool plants.

Valley Needlegrass Grassland: Valley Needlegrass Grassland is typified by the presence of the native perennial bunchgrass, purple needlegrass (*Nassella pulchra*). A small amount of Valley Needlegrass grassland may be present adjacent to the highway.

Vernal Pools: Vernal pool plants found in this area may include: annual hairgrass, semaphore grass, brass buttons, tidy-tips (*Layia fremontii*), goldfields (*Lasthenia californica*), Douglas's meadowfoam (*Limnanthes douglasii rosea*), fringed downingia, Vasey's coyote-thistle (*Eryngium vaseyi*), button celery, Baker's navarretia (*Navarretia leucocephala bakeri*), Sacramento pogogyne (*Pogogyne zizyphoroides*), Delta woolly marbles (*Psilocarphus brevissimus brevissimus*), Oregon woolly-marbles (*P. oregonus*), Greene's popcorn flower (*P. greenei*), microseris (*Microseris* sp.), and white tip clover (*Trifolium variegatum*).

Impacts

Caltrans biologists conducted special-status plant surveys for the project study area. The special-status plant surveys concluded that no plants listed in the California Natural Diversity Database (CNDDDB) or U.S. Fish and Wildlife (USFWS) list of special status

plants were found in the project study area for the proposed project, so no impacts to special-status plants are anticipated for this project.

2.3.4 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NOAA Fisheries) and the California Department of Fish and Game (CDFG) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with special status wildlife that are listed or proposed for listing under the state or federal Endangered Species Act. All special status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species. A full species list is provided in Appendix F.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1601 – 1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

Affected Environment

Special-Status and Protected Birds

Species of birds with special status may be within the project area. specifically, Swainson's Hawk (*Buteo swainsonii*) and Burrowing Owl (*Athene conicularia*).

Niether Swainson's hawk nor Burrowing Owl were observed during habitat assessment surveys within the project area; however, a Section 2081 incidental take permit will be required if these species will be affected by project-related activities.

In addition to the state or federal listing status, most birds that occur within the project area are protected under the Migratory Bird Treaty Act (MBTA) and CDFG codes.

Affected Environment

There will be less than significant impacts to animals protected or not under Federal and State laws in the project area.

Nest removal activities will affect bird nesting habitat and would constitute a potential impact to the nesting habitat; however, because nesting habitat in the BSA is only a small percentage of what exists in the local area, this impact is expected to be a less than significant impact. Therefore, significant impacts to nesting birds is not anticipated

2.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): Title 16 United States Code (USC), Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent 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 Federal Highway Administration, are required to consult with the U.S. Fish and Wildlife Service (USFWS) 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 is a Biological Opinion or an incidental take statement. 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, the California Endangered Species Act (CESA), California Fish and Game Code, 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 California Department of Fish and Game (CDFG) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish

and Game Code 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 CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Affected Environment

The SR 12 project traverses land with significant biological resources. There are four federally listed or proposed animal species that could potentially be affected by the proposed project. These include: California tiger salamander (*Ambystoma californiense*), vernal pool fairy shrimp (*Brachinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), Conservancy fairy shrimp (CFS; *Branchinecta conservatio*), and Delta green ground beetle (*Elaphrus viridis*). Additionally, the project may affect the following California state listed species: Swainson's Hawk (*Buteo swainsonii*), Burrowing Owl (*Athene conicularia*), giant garter snake (*Thamnophis gigus*), and California tiger salamander (*Ambystoma californiense*).

Environmental Consequences

Potential impacts to each species are included in table 5, Including all effect findings (No Effect, May Affect But Not Likely To Adversely Affect, Adversely Affect But Not Jeopardize).

Table 5

Species	No Effect	May Affect But Not Likely To Adversely Affect	Adversely Affect But Not Jeopardize
California tiger salamander (<i>Ambystoma californiense</i>)			X
vernal pool fairy shrimp (<i>Brachinecta lynchi</i>)		X	
vernal pool tadpole shrimp (<i>Lepidurus packardi</i>)		X	
Conservancy fairy shrimp (CFS; <i>Branchinecta conservatio</i>)		X	

Delta green ground beetle (<i>Elaphrus viridis</i>)		X	
Swainson's Hawk (<i>Buteo swainsonii</i>)	X		
Burrowing Owl (<i>Athene conicularia</i>)	X		
giant garter snake (<i>Thamnophis gigus</i>)	X		
nutsedge (<i>Cyperus eragrostis</i>)	X		
common spike rush (<i>Eleocharis macrostachya</i>)	X		
alkali heath (<i>Frankenia salina</i>)	X		
button celery (<i>Eryngium aristulatum</i>)	X		
Baltic rush (<i>Juncus balticus</i>)	X		
Sacramento pogogyne (<i>Pogogyne zizyphoroides</i>)	X		
meadow barley (<i>Hordeum brachyantherum</i>)	X		
purple needlegrass (<i>Nassella pulchra</i>).	X		
tidy-tips (<i>Layia fremontii</i>)	X		
goldfields (<i>Lasthenia californica</i>)	X		
Douglas's meadowfoam (<i>Limnanthes douglasii rosea</i>)	X		
fringed downingia, Vasey's coyote-thistle (<i>Eryngium vaseyi</i>)	X		

Vasey's coyote-thistle (<i>Eryngium vaseyi</i>)	X		
Delta woolly marbles (<i>Psilocarphus brevissimus</i> <i>brevissimus</i>)	X		
Oregon woolly-marbles (<i>P.</i> <i>oregonus</i>)	X		
Greene's popcorn flower (<i>P.</i> <i>greenei</i>)	X		
microseris (<i>Microseris</i> sp.)	X		
white tip clover (<i>Trifolium</i> <i>variegatum</i>)	X		

Avoidance, Minimization, and/or Mitigation Measures

The California tiger salamander would be the only species potentially adversely affected by the SR 12 project. Protocol-level dry and wet season surveys conducted within the project study area for the listed vernal pool crustacean species observed none of the listed species. Avoidance and minimization procedures for these vernal pool crustacean species and for the California tiger salamander were determined in formal Section 7 consultation with USFWS.

Caltrans proposes to avoid, minimize, and mitigate for effects to listed species by implementing the following measures:

- A Service-approved biologist(s) will be designated for the activities that will affect California tiger salamander habitat which has been defined as the entire 13.62-acre project area. The qualified biologist(s) will be on-site during specific construction activities that may reasonably result in the take of the California tiger salamander. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the project site. The biologist(s) will coordinate through the Resident Engineer, to stop any work that may result in take of the California tiger salamander. If work is stopped, the biologist(s) will notify the Service by telephone and electronic mail within one (1) working day.

- The Resident Engineer will halt work and immediately contact the Service-approved project biologist(s) and the Service in the event that a California tiger salamander gains access to a construction zone. The Resident Engineer will suspend construction activities within a 50 foot radius of the indentified animal that could reasonably result in a take of a California tiger salamander until the animal leaves the site voluntarily or is removed by the biologist(s) to a release site using Service-approved handling techniques. Information regarding California tiger salamander handling, transport, and release are included in *Term and Condition 2j* in the Biological opinion in appendix E.
- All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site. The program will include an explanation as how to best avoid take of the California tiger salamander. The Service approved biologist(s) will conduct a training session that will be scheduled as a mandatory informational field meeting by the Caltrans Resident Engineer for all construction contractor supervisory personnel. The field meeting will include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis will be placed on the importance of the habitat and life stage requirements within the context of project maps showing areas where minimization and avoidance measures are being implemented. The program will include an explanation of Federal and State laws protecting the California tiger salamander as well as the importance of compliance with Caltrans and various resource agency conditions.
- No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for the California tiger salamander. These surveys will consist of walking surveys of the project limits and accessible adjacent areas to determine presence of the species. The biologist(s) will investigate all potential California tiger salamander cover sites. This includes thorough investigation of mammal burrows, appropriately sized soil cracks, and debris. The entrances and other refuge features will be collapsed or removed following investigation.
- Should a California tiger salamander be found at the project site, an on-call consultant with the appropriate section 10(a)(1)(a) permit to handle the California tiger salamander will be utilized. Caltrans will submit the name and credentials of the Caltrans staff biologist(s) and the name and permit number of the on-call consultant to the Service prior to ground breaking on the project.

Information regarding California tiger salamander handling, transport, and release are included in Term and Condition 2j in the Biological opinion in appendix E.

- For work that could reasonably result in a take of a California tiger salamander, a Service-approved biologist(s) will be on-site to monitor the initial ground disturbance activities for the road construction. The biologist(s) will perform a clearance survey immediately prior to the initial ground disturbance. Safety permitting, the Service-approved biologist(s) will investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.
- To minimize temporary disturbances in areas of California tiger salamander habitat, project related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent practicable, will be established in locations disturbed by previous activities to prevent further adverse effects. Project related vehicles will observe a 20-mile per hour speed limit, except on County roads, and State and Federal highways. Off-road traffic outside of designated action areas for construction phases with potential California tiger salamander habitat will be prohibited. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and Storm Water Pollution Prevention Plan (SWPPP).
- Work in the vicinity of water crossings will be scheduled to occur between May 15th and October 15th.
- Temporary effects are those activities that are ancillary to permanent construction features and disturb an area for a specific limited period and which can be restored to pre-disturbance-type conditions prior to the beginning of the following year's rainy season (e.g. October 15). Areas temporarily affected by the State Route 12 Project will typically be restored after a single construction season. Where temporary soil disturbance occurs, Caltrans standard erosion control practices will restore cover prior to winter rains and within a single California tiger salamander breeding season. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.

- Dust control measures will consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. In addition, for disturbed soil areas, an organic tackifier to control dust emissions blowing off of the ROW or out of the construction area during construction will be included in the contract special provisions. Watering guidelines for dewatering will be established to avoid any excessive run-off that may flow into contiguous areas. Any material stockpiles will be watered, sprayed with tackifier or covered, to minimize dust production and wind erosion. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
- Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
- To eliminate an attraction to predators of the California tiger salamander, 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 action area. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
- To avoid injury or death of a California tiger salamander, no firearms will be allowed in the action area except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs.
- To prevent harassment, injury or mortality of a California tiger salamander or destruction of their refuge areas, no pets will be permitted in the action area. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
- Use of rodenticides and herbicides in the action area will be used in such a manner to prevent primary or secondary poisoning of a California tiger salamander and the depletion of vegetation on which they depend. All uses of such compounds will observe label and other restrictions mandated by the U.S.

Environmental Protection Agency, California Department of Food and Agriculture, and other appropriate State and Federal regulations, as well as additional project-related restrictions deemed necessary by the Service or the California Department of Fish and Game. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.

- Dedicated fueling and refueling practices will be designated as part of the approved SWPPP. Dedicated fueling areas will be protected from storm water run-on and run-off and will be located at least 50 feet from downslope drainage facilities and water courses. Fueling must be performed on level-grade areas. On-site fueling will only be used where it is impractical to send vehicles and equipment off-site for fueling. When fueling must occur on-site, the contractor will designate an area to be used subject to the approval of the Caltrans Resident Engineer. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
- 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.
- The culverts being replaced shall be designed and installed to allow passage for the California tiger salamander in order to minimize the risk of take due to road mortality following construction. Existing culverts that will remain in place but will be extended should be modified when possible to increase their probable and effective use by the California tiger salamander. Caltrans shall provide the Service with a report on how this measure will be implemented prior to construction and within thirty (30) calendar days following the issuance of the final drainage system design.
- Fencing shall be attached to the Caltrans ROW fence in such a way to prevent California tiger salamanders from gaining access to the roadway and direct them towards the culvert crossings. The exclusionary and directional fencing shall extend a minimum of the length of the project and should terminate in such a way that California tiger salamanders are unlikely to gain ingress to the roadway. Installation of this fencing should also be effective in excluding California tiger salamanders from the fenced Caltrans ROW, therefore minimizing or removing the risk of take associated with non-Federal actions

such as maintenance activities or for future Federal activities that would occur within the fenced ROW.

Compensatory mitigation for impacts to federally-listed California tiger salamander for direct impacts to 13.62 acres of upland dispersal habitat will be a 3:1 ratio as agreed to in the Biological Opinion from the USFWS. Caltrans will compensate for these direct impacts by purchasing 40.86 acres of upland habitat from a USFWS and CDF&G approved mitigation bank. No breeding habitat for CTS will be affected.

No impacts to federally-listed vernal pool crustaceans have been identified. So no compensatory mitigation was developed and implemented in coordination with the appropriate resource agencies.

The complete avoidance, minimization, and mitigation measures for the California tiger salamander can be found in the Biological Opinion in appendix E.

2.3.6 Invasive Species

Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 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 guidance issued August 10, 1999 directs the use of the state's noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

Affected Environment

Construction activities associated with the proposed project have the potential to introduce noxious weeds from the project area into uninfested areas. Potentially at risk areas include neighboring grasslands, wetlands or other waters, and vernal pools. Through the successful implementation of avoidance and minimization efforts, the project will have no adverse impact from noxious weeds on sensitive communities.

Avoidance, Minimization and/or Mitigation Measures

Caltrans will implement the following protection measures:

- Prior to project construction, Caltrans will conduct surveys within the project area for invasive species of highest concern and the preconstruction weed surveys will be mapped.
- Caltrans will not allow disposal of soil and plant materials from any areas that support California Department of Food and Agriculture (CDFA) List A or California Invasive Plant Council (Cal-IPC) List 1 invasive species into natural habitats such as coast live oak woodland, coast live oak-willow riparian forest, or within or directly adjacent to wetlands or other waters.
- Erosion control species will be certified “weed free” to reduce the chances of introducing a new invasive species to the project BSA, or spreading an existing invasive species into unoccupied areas. Additionally, only non-invasive native and/or non-native species will be used for erosion control or landscaping.
- If CDFA List A plants are identified during future surveys, or another invasive habitat threat is identified (e.g., such as the sudden oak death fungal pathogen), all construction equipment shall be pressure washed or steam cleaned prior to initial entry to the project limits. Additionally, other measures as required by CDFA or other agencies may be required to prevent the spread of pathogens or invasive plants.

Cumulative Impacts

Should an invasive plant be observed during future surveys within the BSA, mitigation measures as described above will be implemented. With implementation of mitigation measures, impacts to natural habitats due to invasive weeds, should any be identified, will be less than significant after mitigation is implemented. No significant cumulative impacts are anticipated due to invasive weed species from the SR 12 shoulder widening project. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to invasive species.

2.3.7 Construction Impacts

Affected Environment

The SR 12 shoulder widening construction is to be staged using one-way traffic control, leaving one lane westbound or eastbound, open throughout construction.

Impacts

The proposed the project will be constructed in two stages.

Stage one: Construct the shoulder widening on the westbound direction. This work needs to be performed at night under one-way lane closure.

Stage two: Construct the shoulder widening on the eastbound direction. Place temporary railing (Type K) along the eastbound edge of travel-way and maintain two lanes traffic utilizing the newly constructed westbound shoulder.

The existing centerline rumble strips will be removed and reconstructed during construction. The proposed drainage system work will be constructed along the new shoulder behind the temporary railing (Type K).

Utility relocations have been identified within the project footprint and will be relocated as necessary. All utility relocations will be within the environmental footprint of the proposed project. The potential impacts due to relocation of utilities have already been taken into account in the environmental studies.

Avoidance, Minimization, and/or Mitigation Measures

A Transportation Management Plan (TMP) will be required for this project. The Transportation Management Plan is a special program that will be implemented during construction to minimize and prevent delay and inconvenience to the traveling public. The TMP will include press releases to notify and inform motorists, business, community groups, local entities, and emergency services of upcoming closures. Various TMP elements such as portable changeable message signs and CHP Construction Zone Enhanced Enforcements Program (COZEEP) will be utilized to alleviate and minimize delay to the traveling public.

2.3.8 Climate Change (CEQA)

Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO₂), methane, nitrous

oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level. AB 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the USEPA. The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful (see *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011). However, on January 26, 2009, it was announced that USEPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 USEPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG

emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the USEPA to regulate GHG as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the USEPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)--in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the USEPA's *Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles*, which was published on September 15, 2009¹. On May 7, 2010 the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* was published in the Federal Register².

The final combined USEPA and National Highway Traffic Safety Administration [standards](#) that make 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. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this carbon dioxide level solely

¹ <http://www.epa.gov/climatechange/endangerment.html>

²

<http://www.regulations.gov/search/Regs/contentStreamer?objectId=0900006480a5e7f1&disposition=attachment&contentType=pdf>

through fuel economy improvements. Together, these standards will cut greenhouse gas 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).

According to *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), 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 participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(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 in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

Caltrans and its parent agency, the Business, Transportation, and Housing 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, 2006b), Caltrans has created and is implementing the *Climate Action Program at Caltrans* that was published in December 2006.

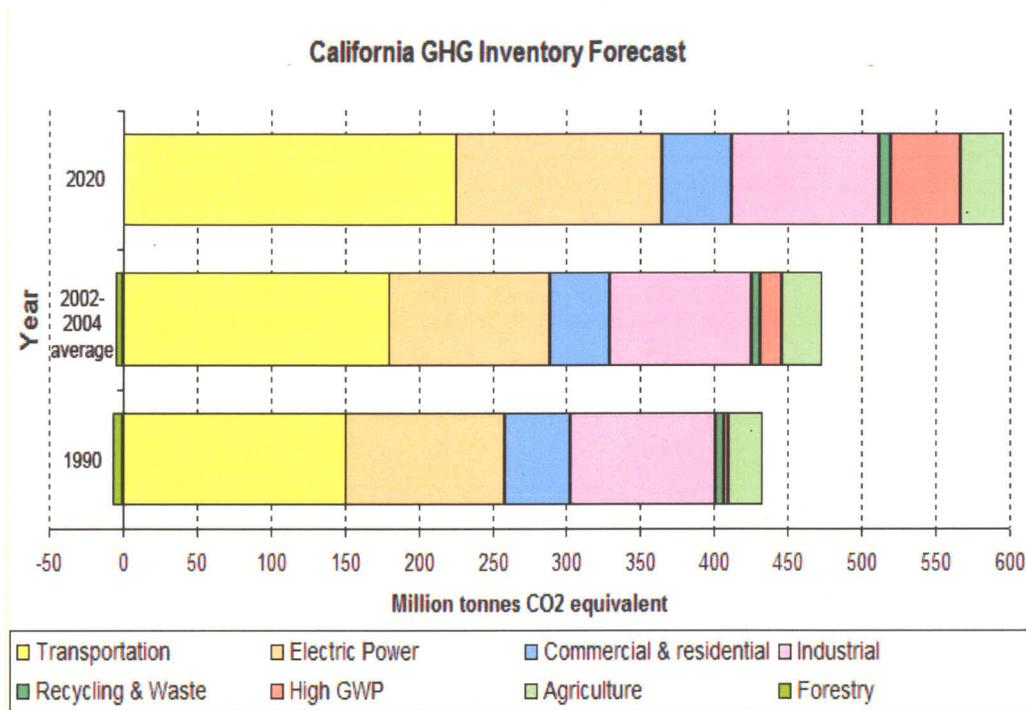


Figure 3 California Greenhouse Gas Inventory

Affected Environment

The project is a safety project that proposes to provide standard eight-foot shoulders, add left-turn pockets, overlay the existing main line, and to improve the vertical sight distances by adjusting the existing profiles.

The project does not involve any changes in the existing use of the facility or the land surrounding the facility. The Purpose and Need of the project, is to improve safety and is not expected to increase the capacity of the existing facility. The project will not affect traffic and circulation, alter present patterns of movement of people and/or goods, create traffic, exceed level of service (LOS) standards or require a detour for bike or pedestrian traffic. Because the project will not increase capacity nor induce growth, no increases in operational GHG emissions are anticipated. While construction emissions of greenhouse gases are unavoidable, there will likely be long term benefits with improved safety (reduced number of collisions to cause delays), operation and smoother pavement surface.

Greenhouse gas (GHG) 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,

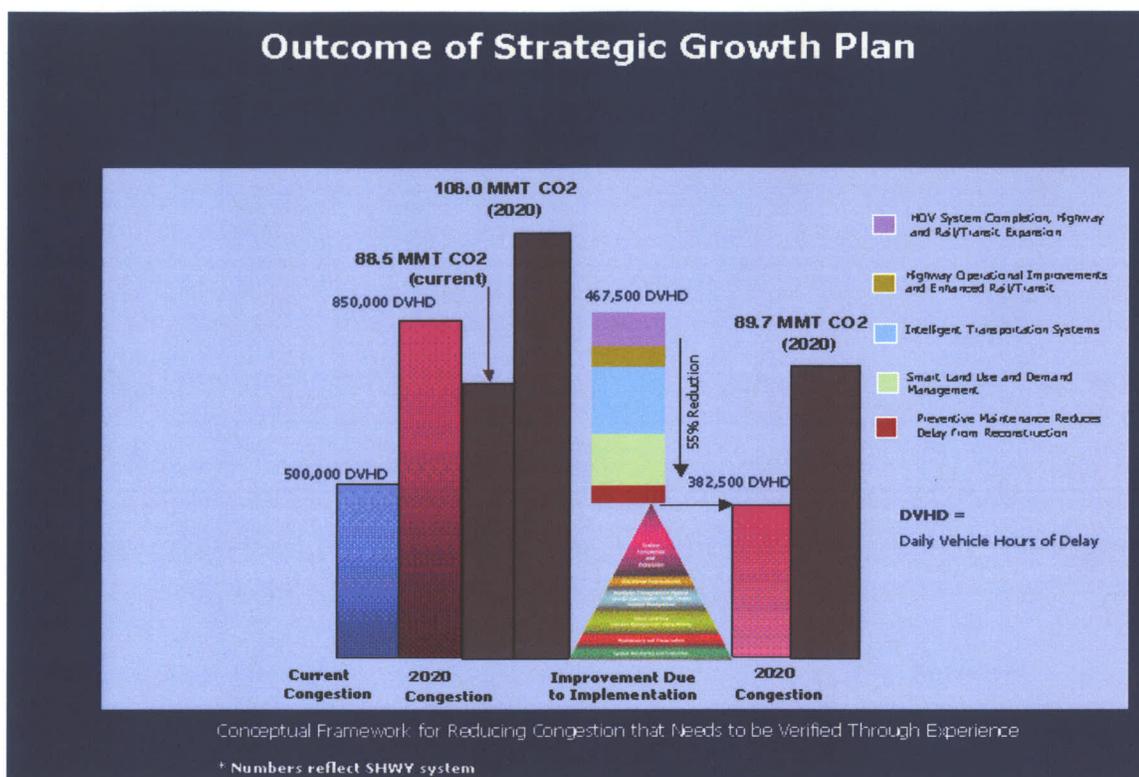
emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence will be somewhat reduced by utilizing the construction impact measures identified in the Construction Impacts Section 2.3.7 of this document. In addition, with innovations such as longer pavement lives and changes in materials, the GHG emissions produced during construction can be reduced to some degree by providing longer intervals between maintenance and rehabilitation events.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders 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 the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a \$238.6 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including \$100.7 billion in transportation funding through 2016.³ As shown on the figure below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

Figure 4 Outcome of Strategic Growth Plan

³ Governor's Strategic Growth Plan, Fig. 1 (<http://gov.ca.gov/pdf/gov/CSGP.pdf>)



As part of the Climate Action Program at Caltrans (December 2006, <http://www.dot.ca.gov/docs/ClimateReport.pdf>), 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 is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting 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 its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 6 summarizes the Department and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at <http://www.dot.ca.gov/docs/ClimateReport.pdf>

Table 6 Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO ₂ Savings (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	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	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, CARB, 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	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.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	1.236	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated

Total				2.7 2	18.67
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To the extent that it is applicable or feasible for the project and through coordination with the project development team during the design phase of this project, measures considered for other projects to reduce the GHG emissions and potential climate change impacts will be considered.

Chapter 3 Comments and Coordination

During the preparation of this document, the following agencies were consulted:

U. S. Army Corps of Engineers (USACE)

U. S. Fish and Wildlife Service (USFWS)

California Department of Fish and Game (CDFG)

Solano Transportation Authority (STA)

Metropolitan Transportation Commission (MTC)

California Department of Conservation (CDC)

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: project development team meetings, and interagency coordination. This chapter summarizes the results of the Department's efforts to fully identify, address and resolve project-related issues through early and continuing coordination.

A Public Notice of the availability of the Draft Environmental Document with a comment period from April 28, 2008 to May 28, 2008 was advertised.

The Draft Environmental Document was made available for review at the following locations, and also at the Caltrans website at: www.dot.ca.gov/dist4.envdocs.htm.

Caltrans District 4
Office of Environmental Analysis
111 Grand Avenue
Oakland, CA 94623
(510) 286-6198

Rio Vista Library
44 South Second St.
Rio Vista CA 94571

Suisun City Library
333 Sunset, Suite 280 (2nd floor)
Suisun City, CA 94585

Comments and Responses

The following comments were submitted by letters phone or email to Caltrans during the comment period, which ran from April 28, 2008 to May 28, 2008. Caltrans considered comments and, where appropriate, prepared written responses.

No requests for a public meeting were made during the comment period

No formal public hearing on this project was held. Two property owners requested meetings with Caltrans staff. Caltrans had public meetings with Robert V. Cattey and Richard Braun. One owns a business on the southeast side of the project, and the other owns a residence on the northeast side of the project. The property owners expressed the following:

- Interest in preserving the trees in front of their properties.
- Concern about driveway accessibility during construction.
- Interest in adding a left-turn pocket on westbound State Route 12 to access a private business driveway -Cattey Lane-

Concern about the potential for increased flooding near Well Creek as a result of this project.

The trees on the property located on the northeast side of the project will not be affected as the project limit ends prior to this property. A number of trees outside and within one residential front yard near Well Creek will have to be removed in order to meet the project goal of constructing an eight-foot wide standard shoulder, and to provide maintenance access and a clear recovery zone in accordance with Caltrans Highway Design Manual (HDM) 6th Edition and Roadside Design Guide 3rd Edition 2006 published by American Association of State Highway and Transportation Officials

(AASHTO). Caltrans is willing to compensate for tree removal at a 1:1 ratio by paying for replanting of new trees on private property outside of the clear recovery zone.

The project limits end at the west side of the property's front driveway. A small portion of this private driveway could be affected due to the shoulder widening. Currently, this private area is filled with dirt and gravel. Any impact to the driveway caused by the project will be repaired and paved as necessary. However, adding a left turn lane in front of Cattey Lane, a private driveway, is not part of the project's scope.

The following comments were submitted by letters phone or email to Caltrans during the comment period, which ran from April 28, 2008 to May 28, 2008. Caltrans considered comments and, where appropriate, prepared written responses.

Delta Protection Commission

Delta Protection Commission comments on the proposed project were to recommend that review and analysis of the proposed project take into consideration relevance to the policies of the Delta Protection Commission Land Use and Resource Management Plan for the Primary Zone of the Delta, including but not limited to, Environment, Utilities and infrastructure, and Land Use.

Response:

The department has reviewed the Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta and found that although the proposed project is in the Secondary Zone the proposed project is still consistent with the findings, policies, and recommendations of the Management Plan

Melissa Escaron Staff Environmental Scientist, California Department of Fish and Game

I wanted to suggest that burrowing owl surveys may be prudent given that there are occurrences within the vicinity. Please contact me if you would like to discuss further.

Response:

Consultants have finished the burrowing owl phase 2 burrow search with no burrows found within the ROW. Also, there is the presence within the R/W of predators such as gopher snake (found in the culverts), raccoon, and fox.

Please see appendix D for copies of comment letters and emails.

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 Concord CA 94520-7931

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The Honorable Lois Wolk
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Appendix A CEQA Environmental Significance Checklist

This checklist identifies physical, biological, social and economic factors that under CEQA might be affected by the proposed project. Where the checklist determination is something other than “no impact”, the associated environmental topic is further discussed in the environmental document.

Supporting documentation of all CEQA checklist determinations is provided in Chapters 2, 3, and 4 of this Initial Study/Environmental Assessment. Documentation of “No Impact” determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or compensation measures under the appropriate topic headings in Chapters 2, 3, and 4.

Environmental Significance Checklist

	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	x	<input type="checkbox"/>
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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air-quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	x	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
	<input type="checkbox"/>	<input type="checkbox"/>	x	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife	<input type="checkbox"/>	x	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	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			

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
	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.			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
j) Inundation by seiche, tsunami, or mudflow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	x

Appendix B Title VI Policy Statement

STATE OF CALIFORNIA — BUSINESS, TRANSPORTATION AND REVENUE AGENCY

ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
1170 N STREET
P. O. BOX 942873
SAKRAMENTO, CA 95833-4191
PHONE (916) 654-5256
FAX (916) 654-6505
TTY (916) 651-4086

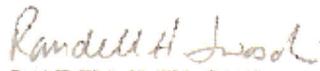


*"Eureka power!"
"No longer efficient!"*

August 25, 2009

TITLE VI POLICY STATEMENT

The California State 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, 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.


RANDELL H. IWASAKI
Director

"California improves mobility across California"

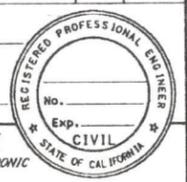
Appendix C Layouts, Cross Sections, and Abbreviations

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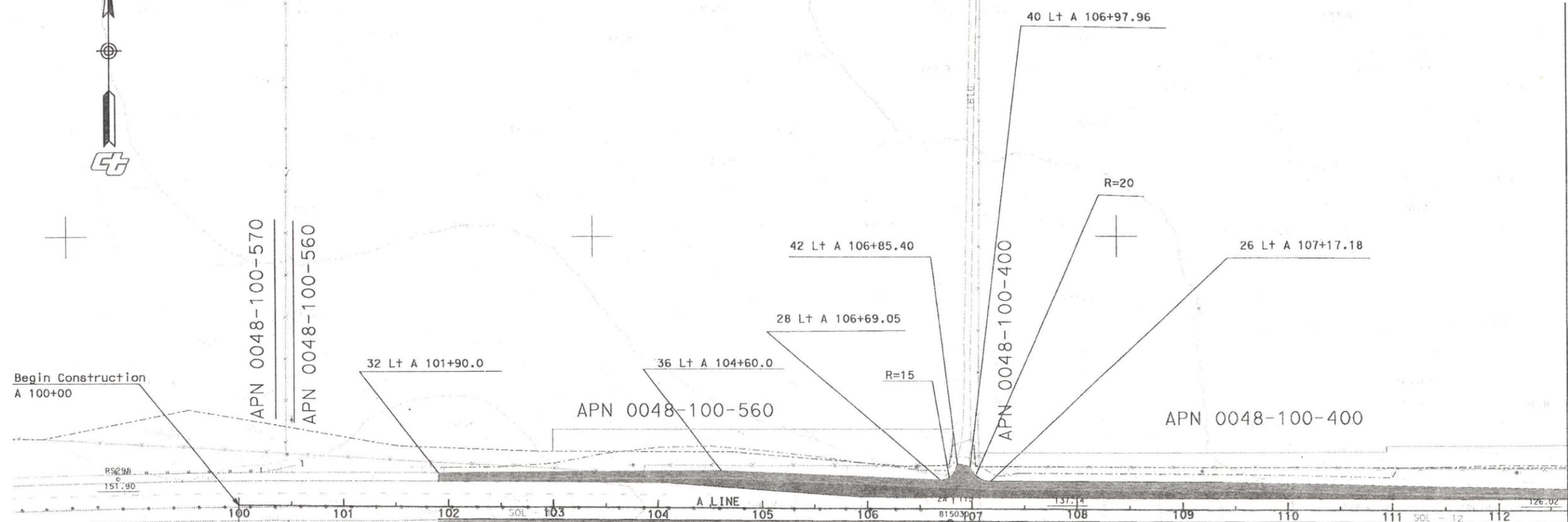
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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SOL 12 SHOULDER WIDENING & LEFT TURN LANES PROJECT (ALIGNMENT A - CURRIE & McCLOSKEY ROADS)



- LEGEND**
- ROADWAY CENTER LINE
 - - - PROPOSED CUT/FILL LINE
 - - - Exist R/W LINE
 - - - PROPOSED R/W TAKE
 - ▬ NEW TRAVELWAY
 - ▬ NEW SHOULDER
 - ▬ OVERLAY ON MAINLINE
 - ▬ AREA OF PROFILE CORRECTION
 - ▬ STAGING/STORAGE AREA

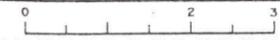
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN
 FUNCTIONAL SUPERVISOR: MICHAEL T. NGUYEN
 CALCULATED/DESIGNED BY: MICHAEL T. NGUYEN
 CHECKED BY: MICHAEL T. NGUYEN
 REVISOR: WILLIAM H. FONG
 DATE REVISED: MICHAEL T. NGUYEN

SEE SHEET L-2

LAYOUT
SCALE 1"=100'
L-1

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE
15 IN INCHES



USERNAME => e123404
DGN FILE => L1PoEd.dgn

CU 04223

EA 2A6200

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 00-00-00 TIME PLOTTED => 11:01

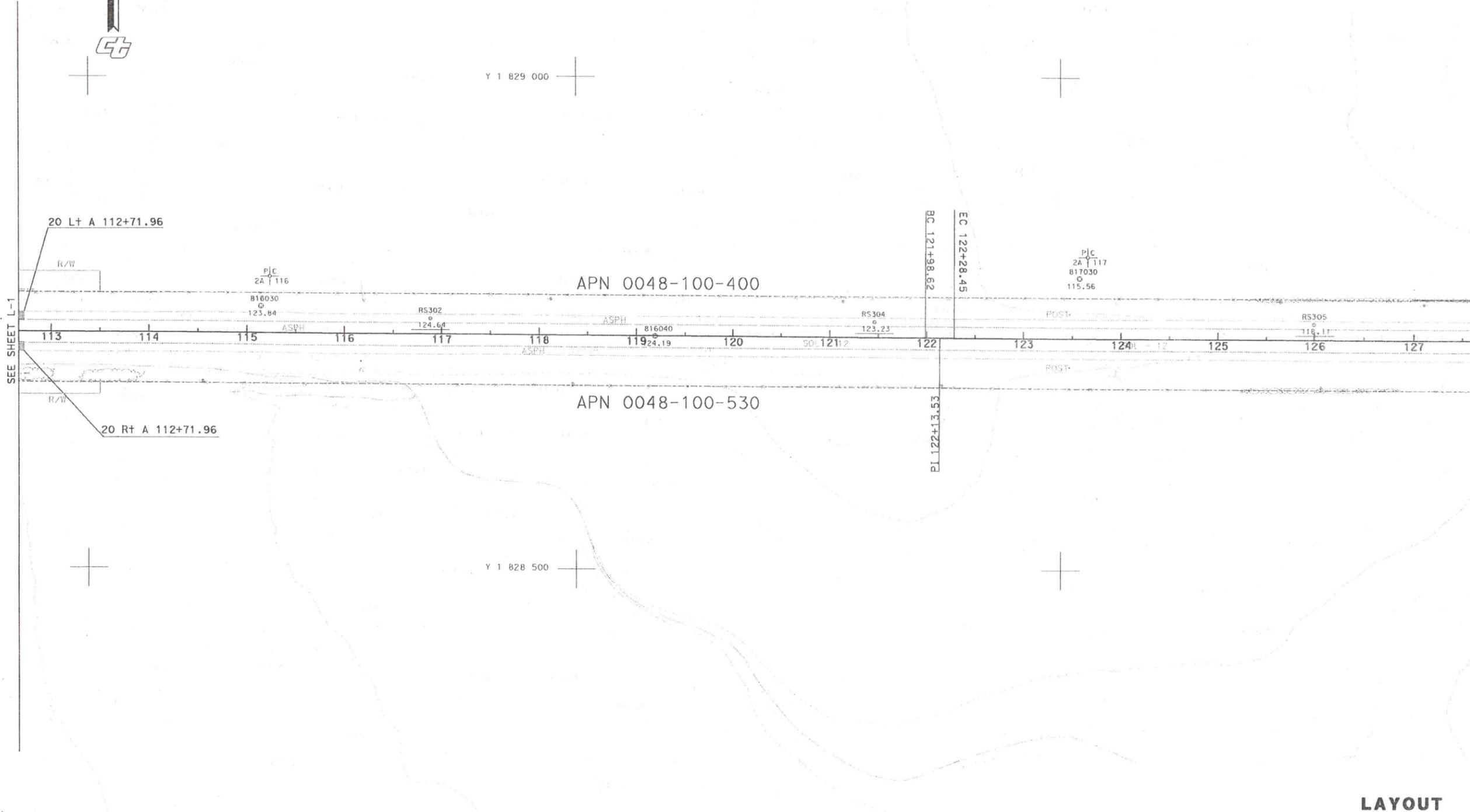
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REGISTERED CIVIL ENGINEER DATE _____

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SOL 12 SHOULDER WIDENING & LEFT TURN LANES PROJECT (ALIGNMENT A - CURRIE & McCLOSKEY ROADS)



SEE SHEET L-1

SEE SHEET L-3

STATE OF CALIFORNIA	DEPARTMENT OF TRANSPORTATION	DESIGN
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FUNCTIONAL SUPERVISOR	MICHAEL T. NGUYEN	
CALCULATED/DESIGNED BY	CHECKED BY	
WILLIAM H. FONG	MICHAEL T. NGUYEN	
REVISED BY	DATE REVISED	

BORDER LAST REVISED 3/1/2007



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DGN FILE => L2PaEd.dgn

CU 04223

EA 2A6200

LAYOUT
SCALE 1"=100'
L-2

LAST REVISION DATE PLOTTED => 08-JUL-2009
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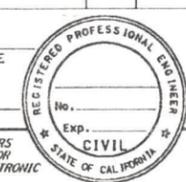
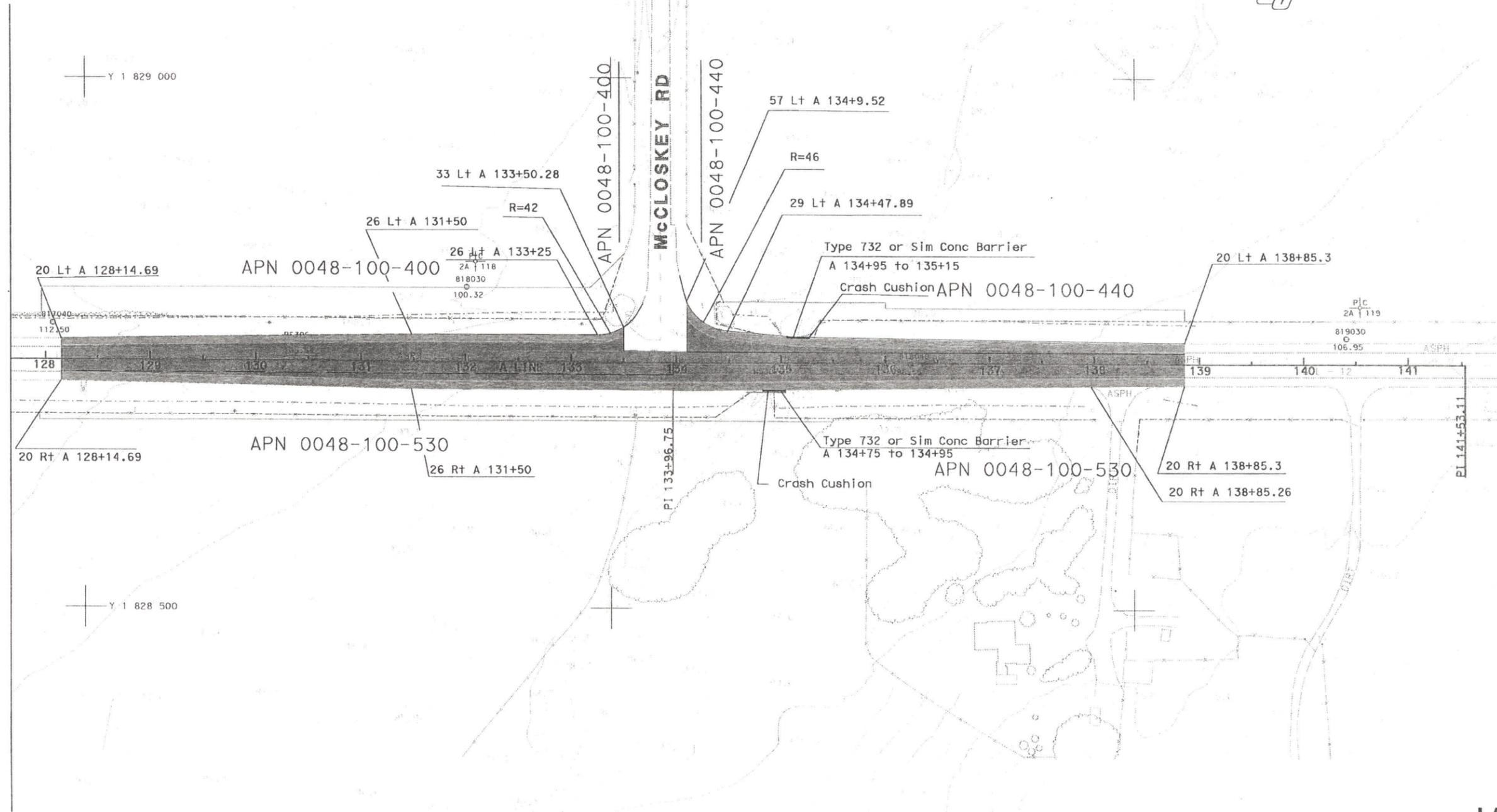
SOL 12 SHOULDER WIDENING & LEFT TURN LANES PROJECT (ALIGNMENT A - CURRIE & McCLOSKEY ROADS)

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04	SOL	12	20.6/21.3&22.6/23.7		

REGISTERED CIVIL ENGINEER DATE _____

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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FUNCTIONAL SUPERVISOR: MICHAEL T. NGUYEN

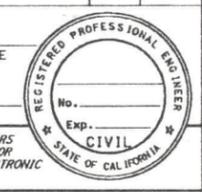
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CHECKED BY: MICHAEL T. NGUYEN

REVISOR BY: WILLIAM H. FONG
DATE REVISED: MICHAEL T. NGUYEN

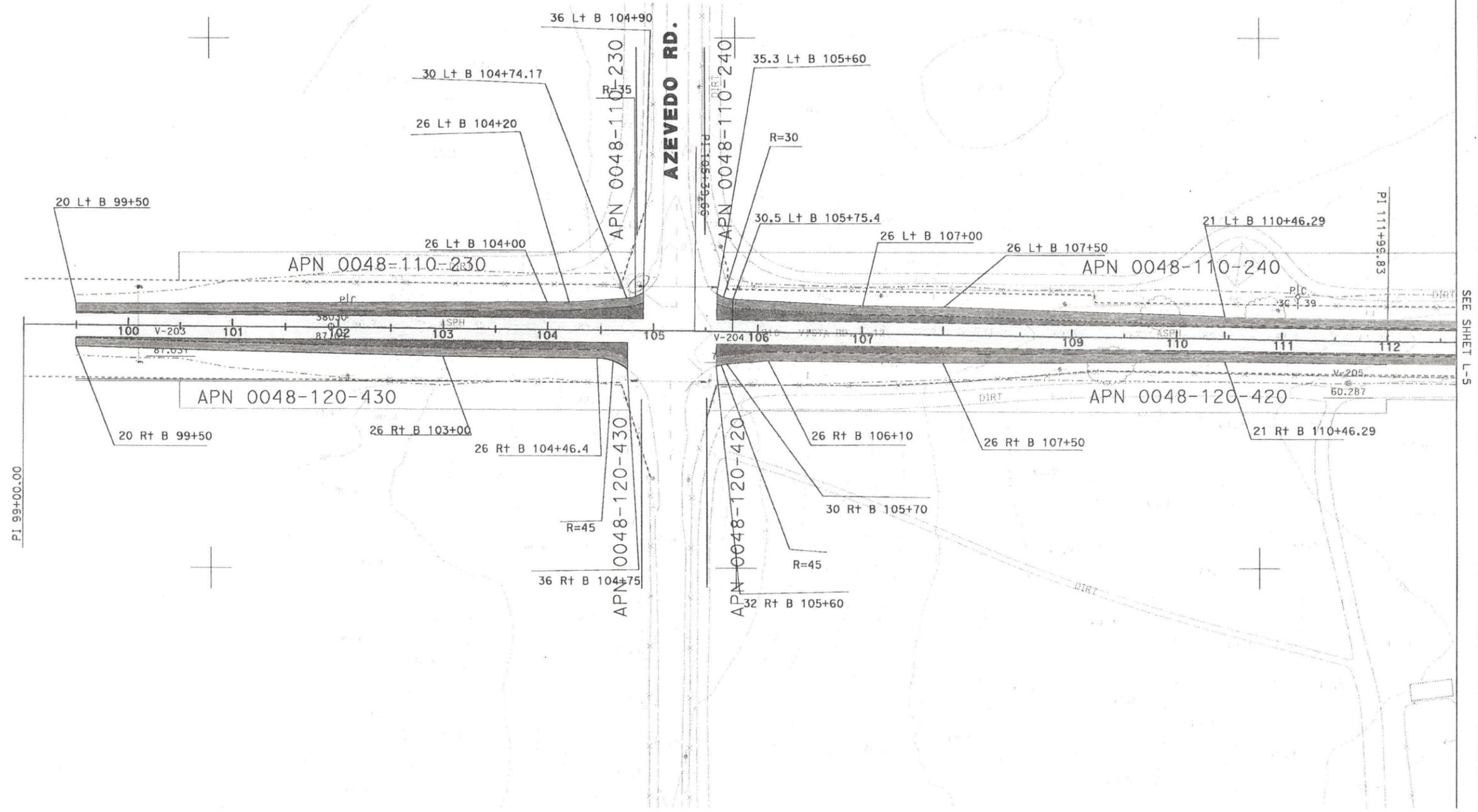
LAYOUT
SCALE 1"=100'
L-3

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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REGISTERED CIVIL ENGINEER DATE _____
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SOL 12 SHOULDER WIDENING & LEFT TURN LANE PROJECT (ALIGNMENT B)



SEE SHEET L-5

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 CHECKED BY: [blank]
 WILLIAM H. FONG
 REVISOR: MICHAEL T. NGUYEN
 DATE REVISOR: [blank]

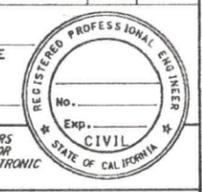
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L-4

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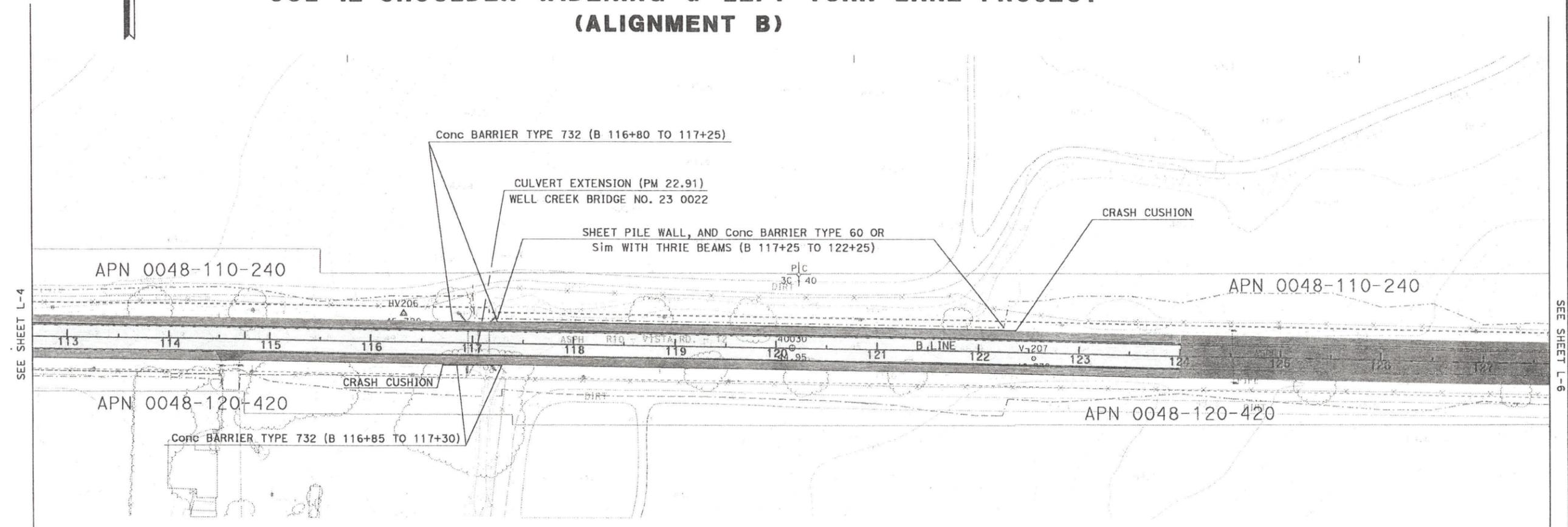
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REGISTERED CIVIL ENGINEER DATE _____
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SOL 12 SHOULDER WIDENING & LEFT TURN LANE PROJECT (ALIGNMENT B)



SEE SHEET L-4

SEE SHEET L-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN	FUNCTIONAL SUPERVISOR	REVISOR	DATE
Caltrans		MICHAEL T. NGUYEN	WILLIAM H. FONG	
		MICHAEL T. NGUYEN	MICHAEL T. NGUYEN	
		CALCULATED/DESIGNED BY	CHECKED BY	DATE REVISED

LAYOUT
SCALE 1"=100' **L-5**

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans DESIGN

FUNCTIONAL SUPERVISOR
 MICHAEL T. NGUYEN

CALCULATED-DESIGNED BY
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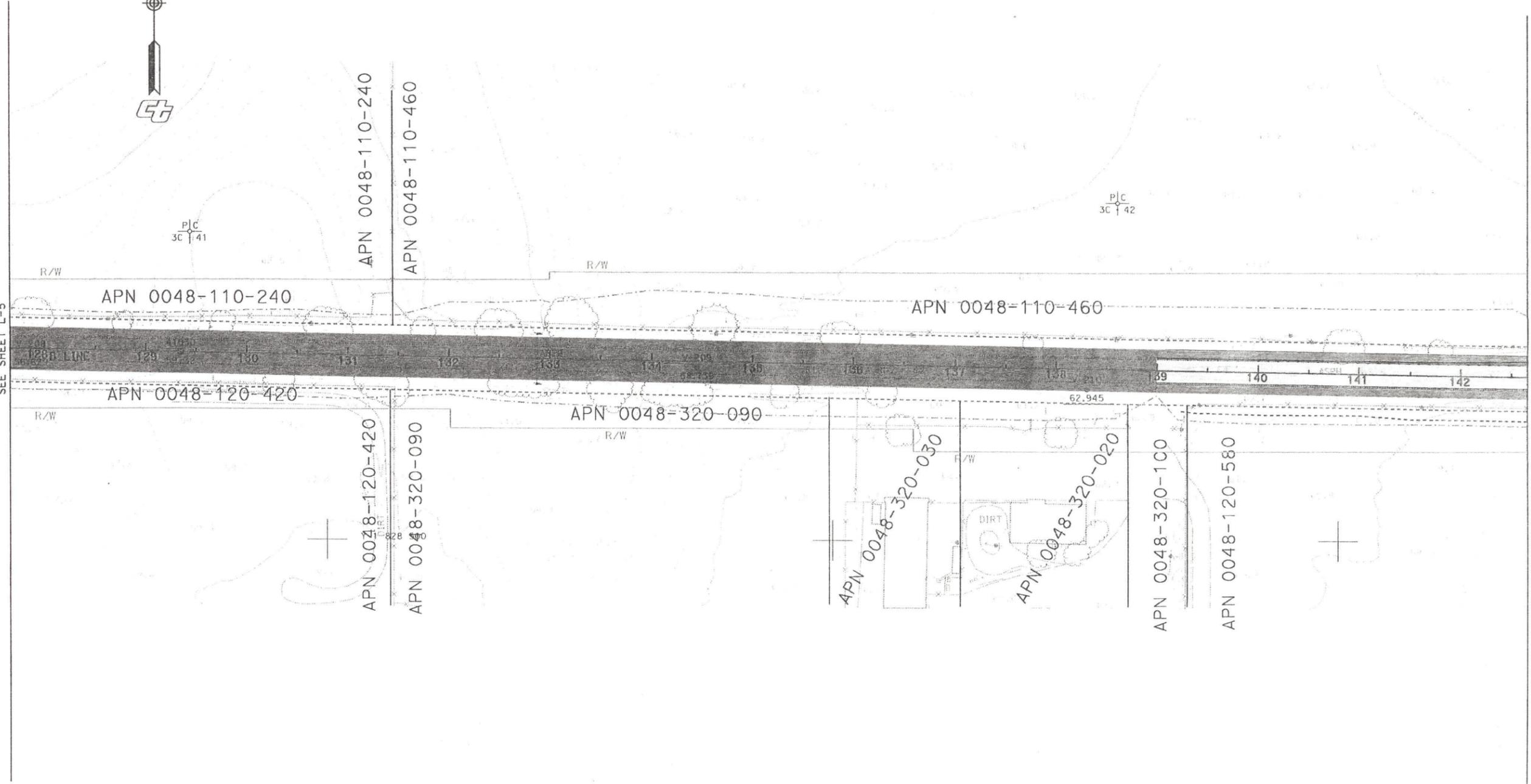
WILLIAM H. FONG
 MICHAEL T. NGUYEN

REVISED BY
 DATE REVISED

SEE SHEET L-5

SEE SHEET L-7

SOL 12 SHOULDER WIDENING & LEFT TURN LANE PROJECT (ALIGNMENT B)



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SOL	12	20.6/21.3&22.6/23.7		

REGISTERED CIVIL ENGINEER DATE _____

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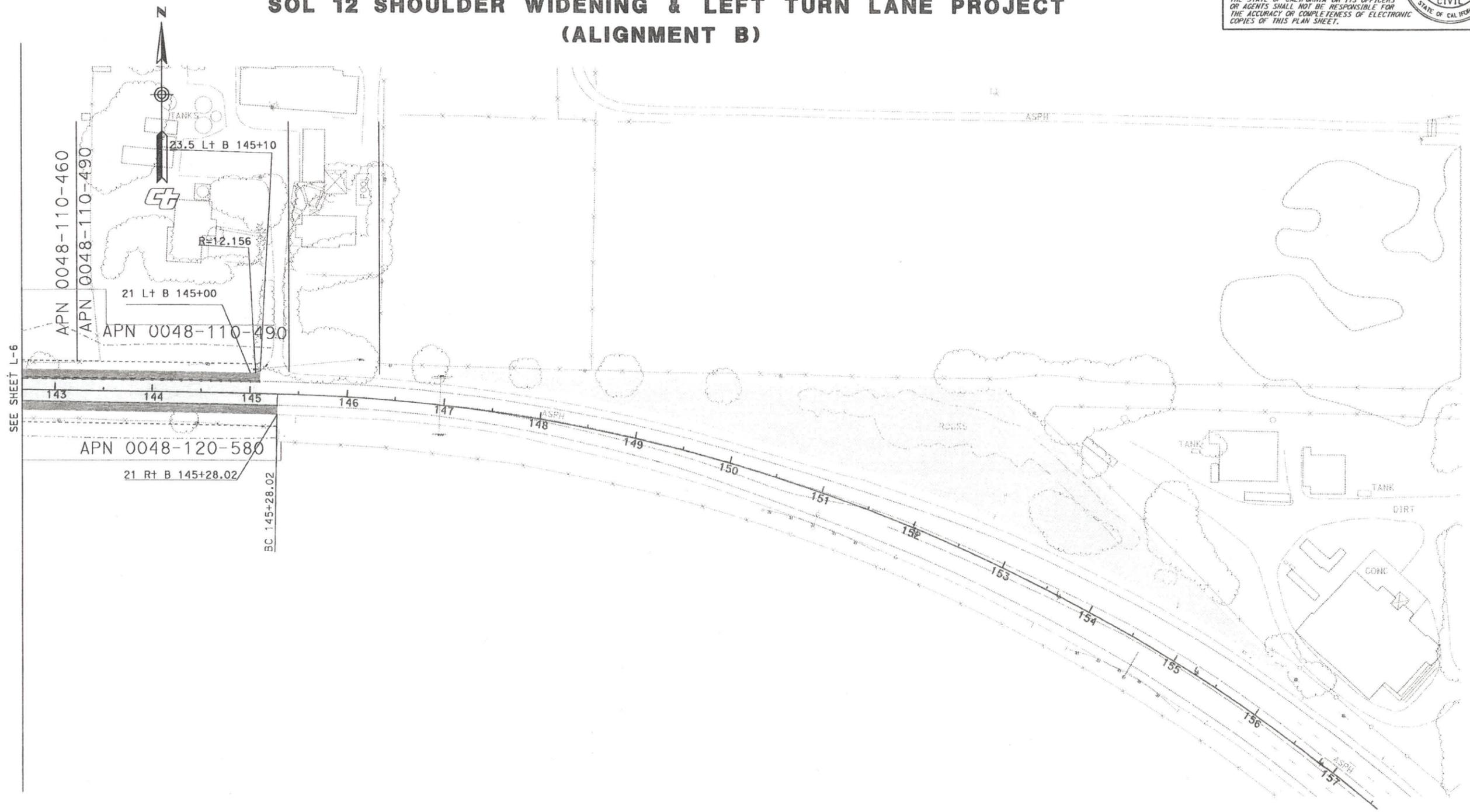
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REGISTERED CIVIL ENGINEER DATE _____
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SOL 12 SHOULDER WIDENING & LEFT TURN LANE PROJECT (ALIGNMENT B)



SEE SHEET L-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION Caltrans	DESIGN	FUNCTIONAL SUPERVISOR MICHAEL T. NGUYEN	CALCULATED-DESIGNED BY CHECKED BY	WILLIAM H. FONG MICHAEL T. NGUYEN	REVISED BY DATE REVISED
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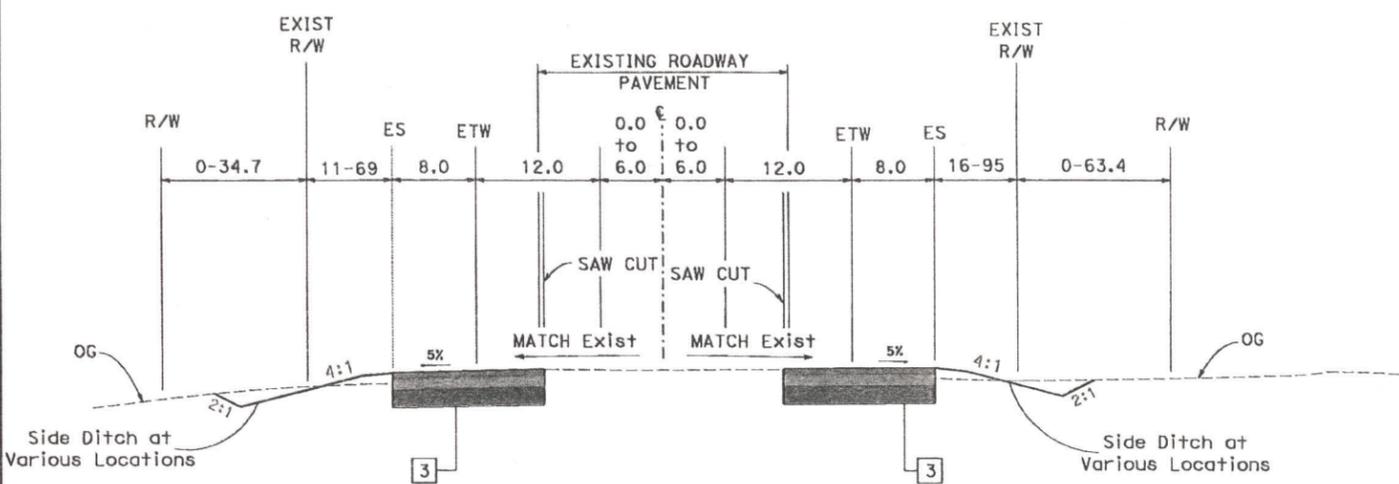
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PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.</small>					

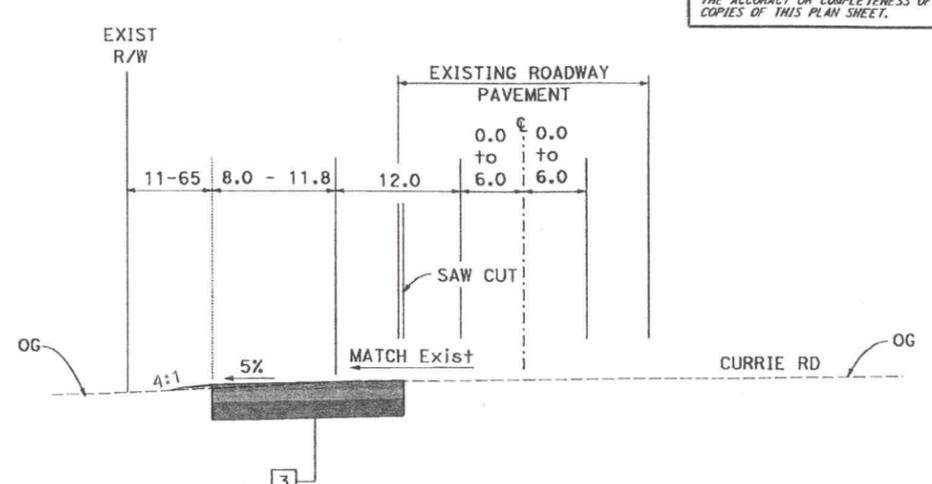


STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
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 REVISIONS: WILLIAM H. FONG, MICHAEL T. NGUYEN
 REVISOR: DATE REVISOR: DATE



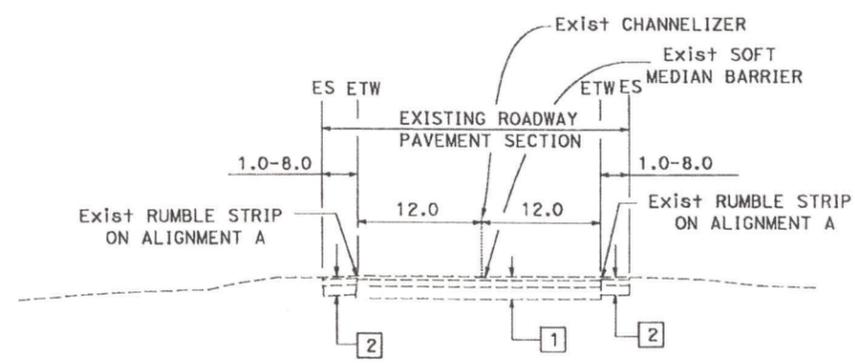
SHOULDER WIDENING & LEFT-TURN LANE

A 101+90 TO 106+75
 A 107+25 TO 112+72

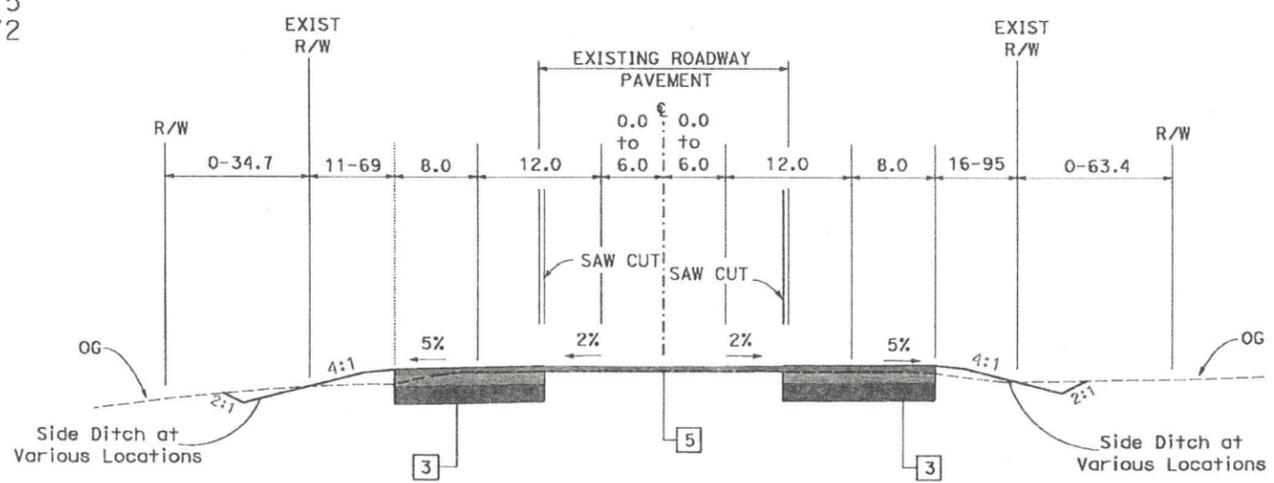


SHOULDER WIDENING & LEFT-TURN LANE

A 106+75 TO 107+25



EXISTING ROADWAY PAVEMENT



SHOULDER WIDENING & LEFT-TURN LANE

A 128+15 TO 133+50
 A 134+10 TO 134+75
 A 135+15 TO 138+85

- 1) Exist
0.45 ft AC (B)
0.50 ft AB (2)
1.55 ft AS (4)
- 2) Exist
0.20 ft AC (B)
0.50 ft AB (2)
0.65 ft AS (4)
- 3) 0.65 ft HMA (A)
1.05 ft AB (2)
1.60 ft AS (4)
- 4) 0.50 ft HMA (A)
- 5) 0.50 ft HMA (A)
0-0.50 ft HMA (A) Leveling

NOTES:
 1) RUMBLE STRIP AND CHANNELIZERS TO BE RECONSTRUCTED IN MEDIAN.
 2) RUMBLE STRIP TO BE CONSTRUCTED ON OUTSIDE SHOULDERS.

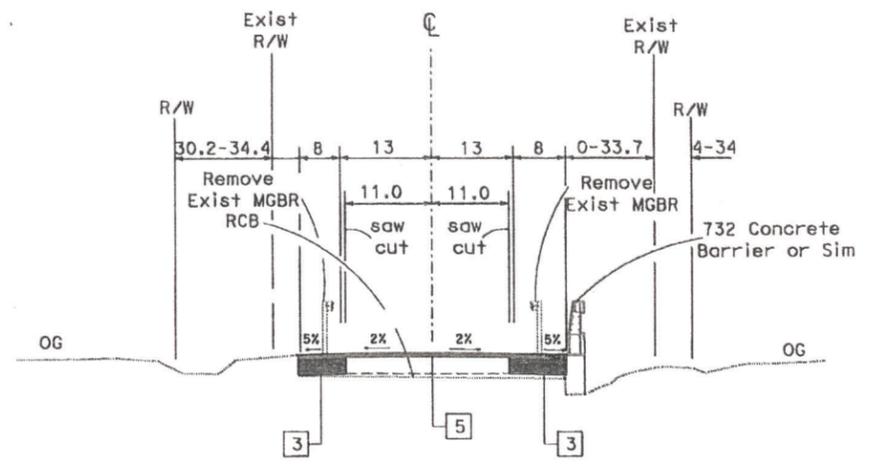
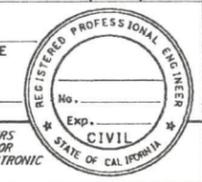
ALL DIMENSIONS ARE IN FEET
 UNLESS OTHERWISE NOTED

TYPICAL CROSS SECTIONS
 NO SCALE

X-1

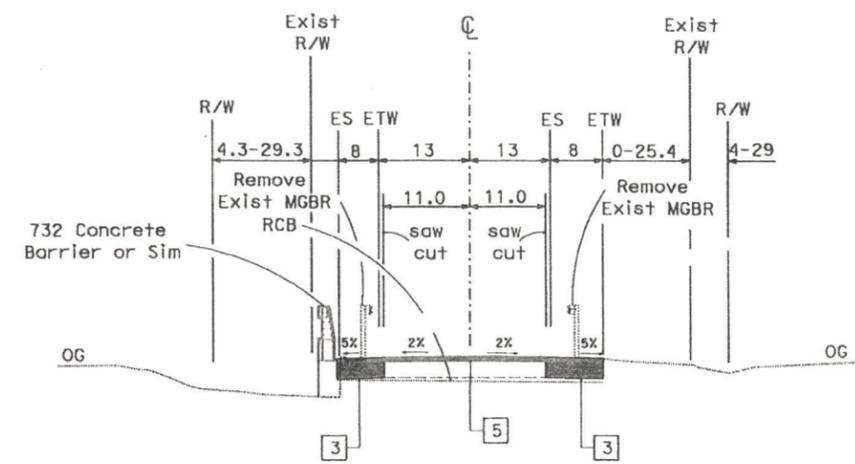
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REGISTERED CIVIL ENGINEER DATE				
PLANS APPROVAL DATE				
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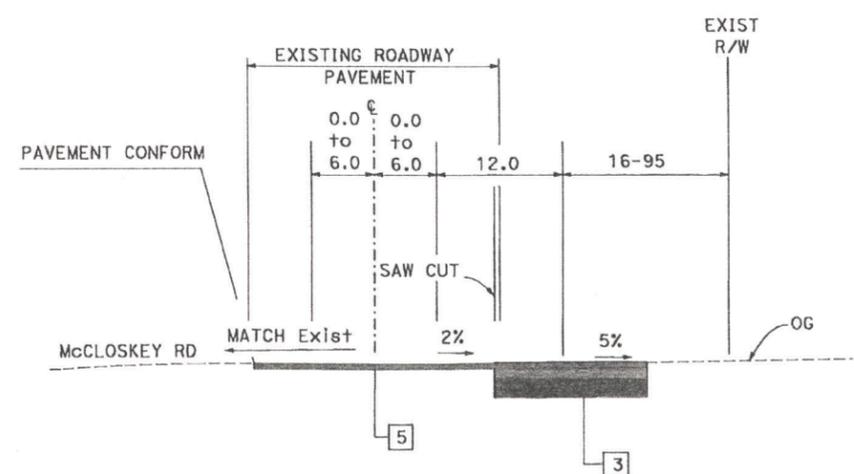
ROUTE 12

A 134+75 TO 134+95



ROUTE 12

A 134+95 TO 135+15



SHOULDER WIDENING & LEFT-TURN LANE

A 133+50 TO 134+10

- NOTES:
- 1) RUMBLE STRIP AND CHANNELIZERS TO BE RECONSTRUCTED IN MEDIAN.
 - 2) RUMBLE STRIP TO BE CONSTRUCTED ON OUTSIDE SHOULDERS.

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE NOTED

TYPICAL CROSS SECTIONS
NO SCALE
X-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St Gobans
 DESIGN
 FUNCTIONAL SUPERVISOR: MICHAEL T. NGUYEN
 CHECKED BY: MICHAEL T. NGUYEN
 CALCULATED-DESIGNED BY: MICHAEL T. NGUYEN
 REVISOR: WILLIAM H. FONG
 DATE REVISED: MICHAEL T. NGUYEN

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 DESIGN

FUNCTIONAL SUPERVISOR
 MICHAEL T. NGUYEN

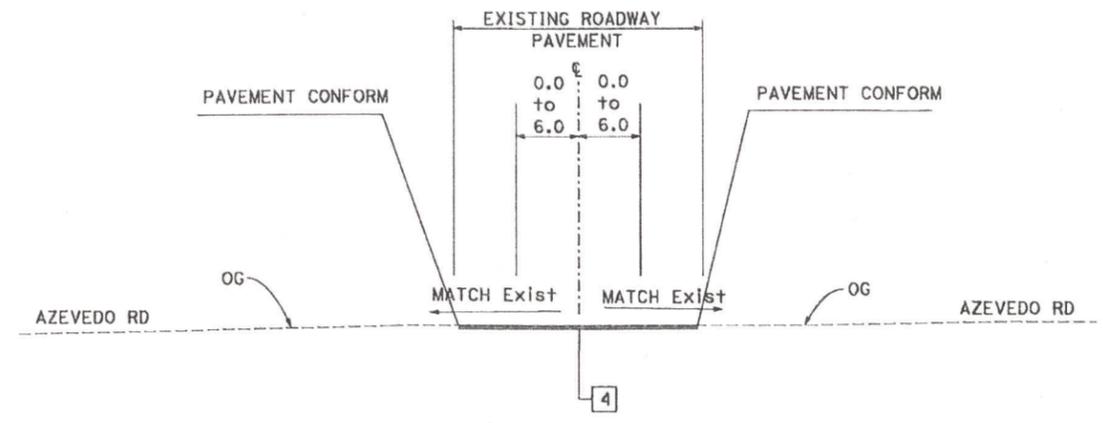
CALCULATED-DESIGNED BY
 CHECKED BY

WILLIAM H. FONG
 MICHAEL T. NGUYEN

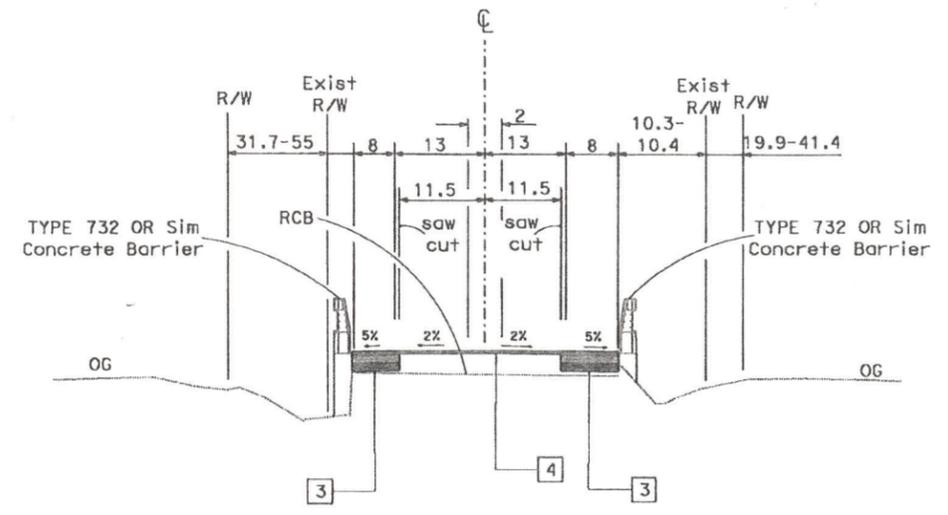
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 DATE REVISED

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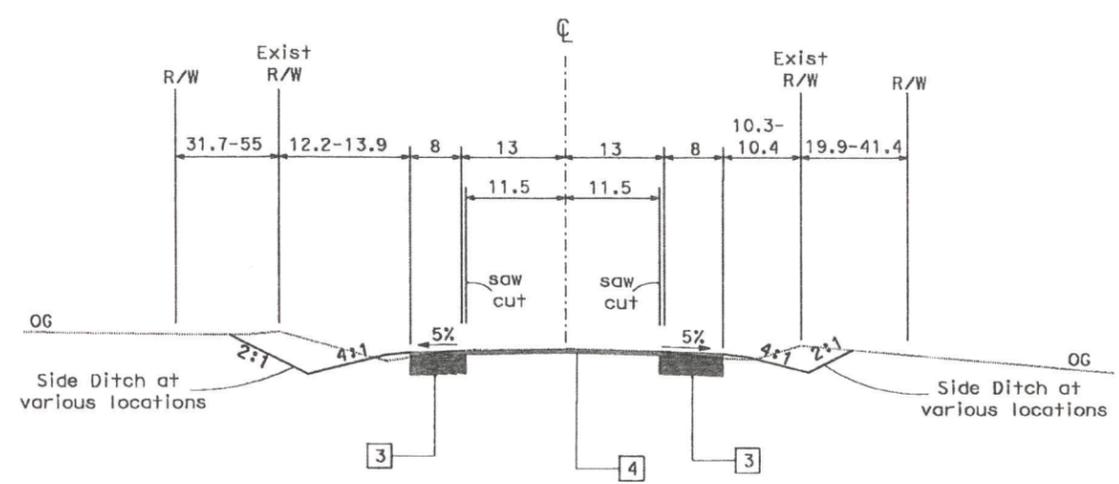
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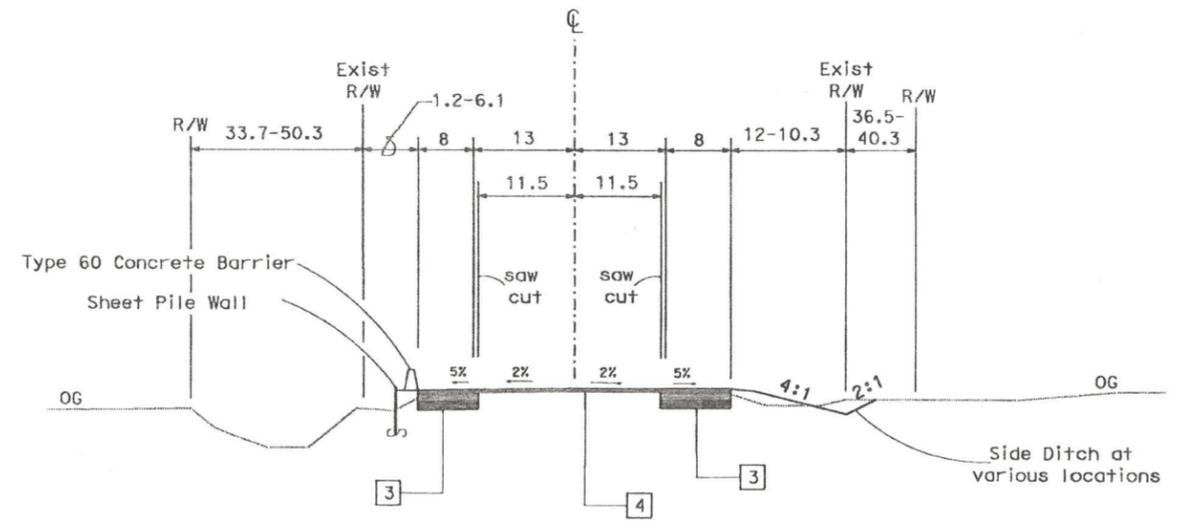
SHOULDER WIDENING & LEFT-TURN LANE
 B 104+75 TO 105+60



ROUTE 12
 B 116+75 TO 117+25



ROUTE 12
 B 99+50 TO 104+75
 B 105+60 TO 116+75
 B 122+25 TO 127+00
 B 138+00 TO 145+28



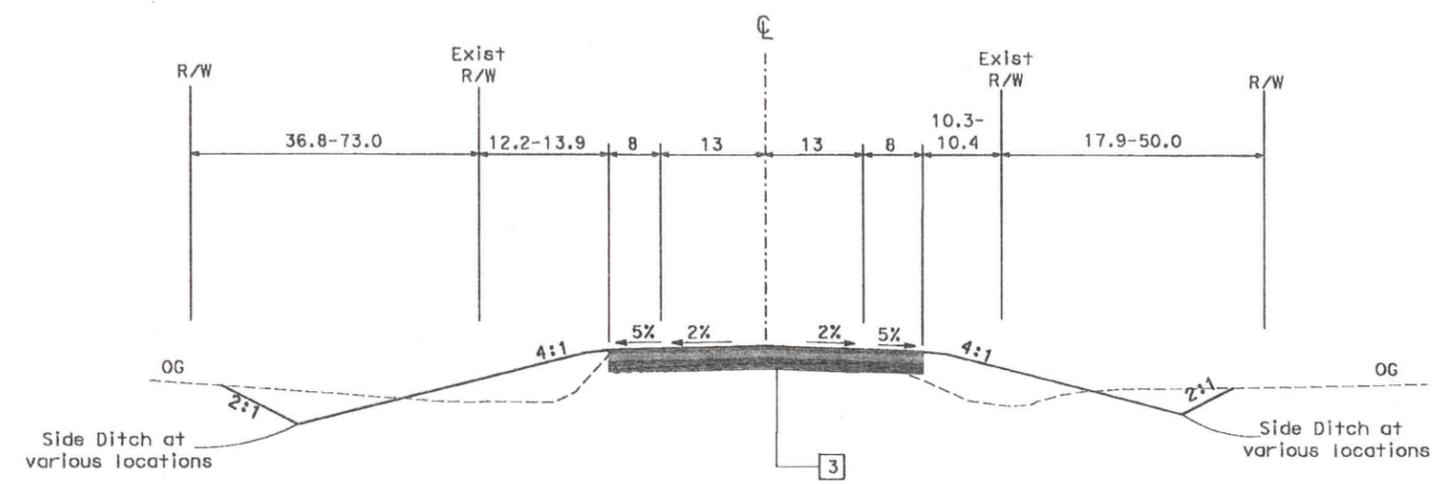
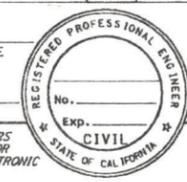
ROUTE 12
 B 117+25 TO 122+25

- NOTES:
 1) RUMBLE STRIP AND CHANNELIZERS TO BE RECONSTRUCTED IN MEDIAN.
 2) RUMBLE STRIP TO BE CONSTRUCTED ON OUTSIDE SHOULDERS.

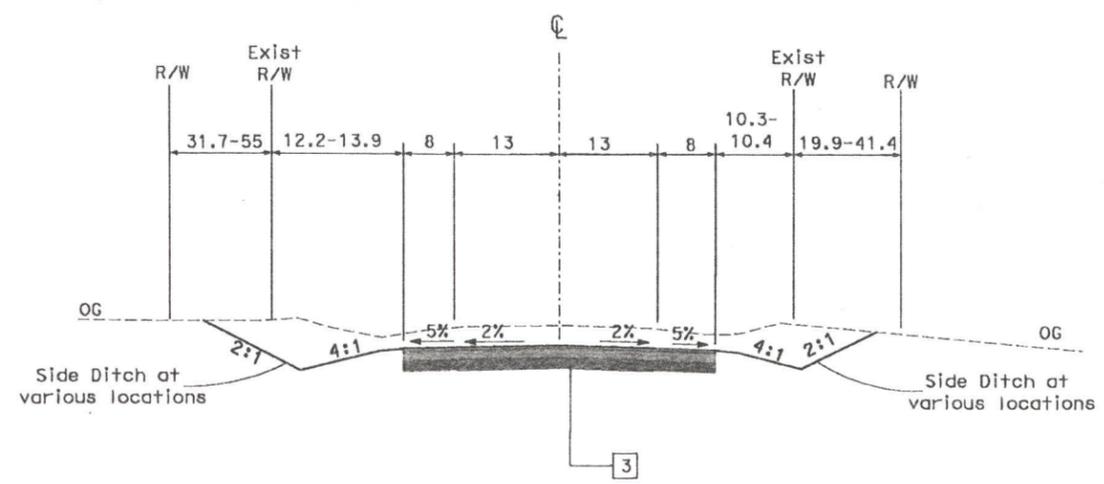
ALL DIMENSIONS ARE IN FEET
 UNLESS OTHERWISE NOTED

TYPICAL CROSS SECTIONS
 NO SCALE
X-3

Dist	COUNTY	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
REGISTERED CIVIL ENGINEER DATE				
PLANS APPROVAL DATE				
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.</small>				



ROUTE 12
B 131+20 TO 138+00



ROUTE 12
B 127+00 TO 131+20

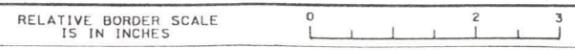
- NOTES:
- 1) RUMBLE STRIP AND CHANNELIZERS TO BE RECONSTRUCTED IN MEDIAN.
 - 2) RUMBLE STRIP TO BE CONSTRUCTED ON OUTSIDE SHOULDERS.

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE NOTED

TYPICAL CROSS SECTIONS
NO SCALE
X-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
FUNCTIONAL SUPERVISOR
MICHAEL T. NGUYEN
REVISOR
WILLIAM H. FONG
DESIGNER
MICHAEL T. NGUYEN
CALCULATED-DESIGNED BY
CHECKED BY

BORDER LAST REVISED 3/1/2007



USERNAME => s123404
DGN FILE => X4PaEd.dgn

CU 04223

EA 2A6200

LAST REVISION
00-00-00
DATE PLOTTED => 08-JUL-2009
TIME PLOTTED => 11:09

2006 STANDARD PLAN A10B

DIST COUNTY ROUTE SHEET NO. TOTAL SHEETS

PROJECT: [] SHEET: [] OF [] SHEETS

DATE: MAY 1, 2006

DESIGNED BY: [] ENGINEER

APPROVED BY: [] ENGINEER

PROJECT: [] SHEET: [] OF [] SHEETS

DATE: MAY 1, 2006

DESIGNED BY: [] ENGINEER

APPROVED BY: [] ENGINEER

PROJECT: [] SHEET: [] OF [] SHEETS

DATE: MAY 1, 2006

DESIGNED BY: [] ENGINEER

APPROVED BY: [] ENGINEER

T continued

S

P continued

M

maint	PI	point of intersection	S	south,	TS	transverse
max	PJP	partial joint penetration	SAE	suppliment	Ts	supplement
MB	P/PL	plate	SAP	structure approach embankment	Typ	tubular steel
UBB	P/L	property line	SAV	salvage	Typ	typical
MBGR	PM	post mile,	SAPP	structural aluminum plate pipe	UC	undercrossing
Med	PN	time from noon to midnight	SB	southbound	UD	underdrain
Med	POC	paving notch	SC	sand cushion	UN	unless otherwise noted
Min	POT	point of horizontal curve	SCSP	slotted corrugated steel pipe	UP	underpass
Misc	POV	point of tangent	SD	storm drain		
Misc I & S	PP	point of vertical curve	Sec	second,		
Mkr	PPL	pipe pile,	Sep	separation	V	vol,
Mod	PPP	plastic pipe,	SG	subgrade	Var	variable
Mod	PPR	power pole	SHD	shoulder	VC	vertical curve
Mon	PPR	performed permeable liner	Shi	sheet	VCP	vertical clay pipe
MP	PRC	perforated plastic pipe	Sim	similar	Ver	vertical
MPGR	PRF	point of reverse curve	Sim	similar	Via	viaduct
MR	PRF	pavement reinforcing fabric	Sim	similar	Vol	volume
MSE	PRVC	point of reverse vertical curve	SM	selected material	W	width
MHI	PS&E	plans, specifications and estimates	Spec	special,	WB	westbound
N	PS, P/S	prestressed	SPP	slotted plastic pipe	WH	weep hole
NB	PSP	perforated steel pipe	SS	slotted plastic pipe	WM	wire mesh
No.	PT	point of tangency	SSB	strap and saddle bracket method	WS	water surface
No.	PVC	polyvinyl chloride	SSD	structural section drain	WSP	welded steel pipe
NF	Pvmt	pavement	SSPA	structural steel plate arch	WT	weight
NIS	Qty	quantity	SSPP	structural steel plate pipe	WW	wingwall
NTS	R	radius	SSPPA	structural steel plate pipe arch	WWL	wingwall layout line
Obir	R & D	remove and dispose	SSRP	steel spiral rib pipe	X Sec	cross section
OC	R & S	remove and salvage	St	street	Xing	crossing
OC	R/C	rate of change	Stn	station	Yr	year
OF	RCA	reinforced concrete arch	STB	single thrie beam barrier	Yrs	years
OC	RCB	reinforced concrete box	Std	standard		
OC	RCP	reinforced concrete pipe	Str	structure		
OC	RCPA	reinforced concrete pipe arch	Surf	surfacing		
OH	Rd	road	Surf	sidewalk,		
0-0	Reinfr	reinforced,	SW	sound wall		
Opp	Reinfr	reinforcing,	Svr	sewer		
P	Rel	reinforcing	Sym	symmetrical		
PAP	Repl	reinforce	SAS	surface 4 sides		
PB	Ret	replacement	T	semi-tangent		
PC	Rev	retaining	TAB	tablet		
PC	Rwy	revised	Tan	tangent		
PCC	RM	roadway	TBB	thrie beam barrier		
PCP	RM	road-mixed	Tbr	timber		
PCV	RP	radius point,	TC	top of curb		
Ped	RR	reference point	TCC	traffic control box		
Ped OC	RSP	rock slope protection	Tei	telephone		
Ped UC	Rt	right	Temp	temporary		
Perm M1	Rte	route	TG	top of grade		
PC	RW	redwood,	Tot	total		
	R/W	retaining wall	TP	telephone pole		
	Rwy	right of way	TPB	treated permeable base		
		railway	TPM	treated permeable material		
			Trans	transition		

UNITS OF MEASUREMENT

Some of the symbols for United States Customary units of measurement used in the Project Plans Quantity Summaries are as follows:

TABLE A

Symbol Used	Definitions
EA	each
LB	pound(s)
ACRE	acre
GAL	gallon
LF	linear foot
SQFT	square foot
CF	cubic foot
SOYD	square yard
CY	cubic yard
STA	100 feet
TAB	tablet
TON	2,000 pounds

Some of the symbols for United States Customary units of measurement used in the Project Plans Quantity Summaries are as follows:

TABLE B

Symbol Used	Definitions
KSI	kips per square inch
KSF	kips per square foot
PSI	pounds per square inch
PSF	pounds per square foot
LB/FT ³	pounds per cubic foot

Other commonly used symbols for United States Customary units of measurement:

TABLE C

Symbol Used	Definitions
Ø	nominal diameter
lb	pound
kip	1,000 pounds
cal	calorie
ft, ft	foot or feet

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ACRONYMS AND ABBREVIATIONS
(SHEET 2 OF 2)

NO SCALE

A10B

2006 STANDARD PLAN A10A

DIST COUNTY ROUTE POST MILES SHEET TOTAL
TOTAL PROJECT SHEETS

REGISTERED CIVIL ENGINEER

May 1, 2006
PLANS APPROVAL DATE

The State of California or its office or any other person shall be liable for damages for any negligence or omission in the preparation or reproduction of these plans.

To get the California web site, go to <http://www.dot.ca.gov>

C continued

E

C continued

A

AB	aggregate base	CG	center of gravity	E	east	EB	end of bridge	EC	end horizontal curve	ECR	end curb return	ED	edge drain	EDC	edge drain cleanout	EDU	edge drain outlet	EDV	edge drain vent	Elec	electrolier	Elev	elevation	Emb	embankment	Engr	Engineer	EDD	edge of deck	EP	edge of pavement	ES	edge of shoulder	ETW	edge of traveled way	EW	end wall	Exc	excavation	Exp	expansion, expressway	Exp Jt	expansion joint	Ext	exterior	F & C	frame and cover	F & G	frame and grate	FB	floor beam	Fdn	foundation	FEBT	facing eastbound traffic	FES	fiared end section	FF	filter fabric	FG	finished grade	FH	fire hydrant	Fig	figure	FL	flow line	FNBT	facing northbound traffic	FOB	free on board	FOC	face of concrete	Fr Rd	frontage road	FS	far side, finished surface	FST	facing southbound traffic	Ftg	footing	FWB	facing westbound traffic	Fwy	freeway	G	acceleration due to gravity	g	gauge	Galv	galvanized	GP	guarding plane	GR	guard railing	GSP	galvanized steel pipe
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AC	asphalt concrete	ADL	added dead load	ADJ	adjust	AFES	alternative fiared end section	Ahd	ahead	Alt	alternate	AM	time from midnight to noon	AP	alternative pipe	APC	alternative pipe culvert	Approx	approximate	APU	alternative pipe underdrain	ARS	acceleration response spectrum	AS	aggregate subbase	ASRP	aluminum spiral rib pipe	Assy	assembly	ATPB	asphalt treated permeable base	ATPM	asphalt treated permeable material	Ave	avenue	Avq	average	@	at	BACR	bridge approach guard railing	BB	beginning of bridge	B-B	back-to-back	BC	begin horizontal curve	BCR	begin curb return	Beg	begin	Bit Ctd	bituminous coated	Bk	back	Bkf	backfill	Blg	building	BLM	bridge-log mill	Bvd	boulevard	Bu	bench mark	Bot	bottom	Br	bridge	Brg	bearing	BTU	british thermal unit	BVC	begin vertical curve	BW	barbed wire	CAA	cable anchor assembly	CAP	corrugated aluminum pipe	CAPA	corrugated aluminum pipe arch	CAS	construction area sign	CB	concrete barrier	CBW	concrete block wall	C-C	center to center
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CA	centerline	CD	centerline	CE	centerline	CF	centerline	CG	centerline	CH	centerline	CI	centerline	CIP	centerline	CL	centerline	CL-6	chain link fence (6 ft)	CL	chain link	CL-6	chain link fence (6 ft)	CM	clearance	CMP	corrugated metal pipe	Co	county	Col	column	Conc	concrete	Cond	conduit	Conn	connector	Const	construct	Cont	continuous	Coord	coordinate	CP	candlepower	Cr	creek	CRCP	continuous reinforced concrete pavement	CRSP	concrete rock slope protection	CSP	corrugated steel pipe	CSPA	corrugated steel pipe arch	CTB	cement treated base	CTPB	cement treated permeable base	CIPM	cement treated permeable material	Ctrs	centers	Culv	culvert	℄	centerline	D	depth	DD	down drain	DBI	double	Deg	degree	Del	delineator	Det	detail	Detour	detour	DF	drainage flir	DI	drop inlet	Dia	diameter	Diaphragm	diaphragm	Dist	distance	District	district	DMBB	double metal beam barrier	Dr	drive	DTBB	double thrie beam barrier	Dwy	driveaway
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DA	drainage area	DB	double	DBI	double	Deg	degree	Del	delineator	Det	detail	DF	drainage flir	DI	drop inlet	Dia	diameter	Diaphragm	diaphragm	Dist	distance	District	district	DMBB	double metal beam barrier	Dr	drive	DTBB	double thrie beam barrier	Dwy	driveaway	E	east	EB	end of bridge	EC	end horizontal curve	ECR	end curb return	ED	edge drain	EDC	edge drain cleanout	EDU	edge drain outlet	EDV	edge drain vent	Elec	electrolier	Elev	elevation	Emb	embankment	Engr	Engineer	EDD	edge of deck	EP	edge of pavement	ES	edge of shoulder	ETW	edge of traveled way	EW	end wall	Exc	excavation	Exp	expansion, expressway	Exp Jt	expansion joint	Ext	exterior	F & C	frame and cover	F & G	frame and grate	FB	floor beam	Fdn	foundation	FEBT	facing eastbound traffic	FES	fiared end section	FF	filter fabric	FG	finished grade	FH	fire hydrant	Fig	figure	FL	flow line	FNBT	facing northbound traffic	FOB	free on board	FOC	face of concrete	Fr Rd	frontage road	FS	far side, finished surface	FST	facing southbound traffic	Ftg	footing	FWB	facing westbound traffic	Fwy	freeway	G	acceleration due to gravity	g	gauge	Galv	galvanized	GP	guarding plane	GR	guard railing	GSP	galvanized steel pipe
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GA	guardrail	GB	guardrail	GC	guardrail	GD	guardrail	GE	guardrail	GF	guardrail	GG	guardrail	GH	guardrail	GI	guardrail	GJ	guardrail	GK	guardrail	GL	guardrail	GM	guardrail	GN	guardrail	GO	guardrail	GP	guarding plane	GR	guard railing	GSP	galvanized steel pipe	H	height	Hr	hour	HD	horizontal drain	hdwl	headwall	Hex Hd	hexagonal head	HMA	hot mixed asphalt	Horiz	horizontal	HP	horsepower	HPS	high performance steel	HS	high strength	HW	headwall, high water	HWM	high water mark	Hwy	highway	I	imported borrow	ID	inside diameter	IF	inside face	Int	interior	Invt	invert	Irr	irrigation	Jct	junction	JP	joint pole	JPCP	jointed plain concrete pavement	JS	junction structure	Jt	joint	K	key	L	length	Lat	latitude	LCB	lean concrete base	Ln	lane	Loc	location	LOL	layout line	Long	longitudinal	Longit	longitudinal	LS	lump sum	Lt	left
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HA	horizontal	HB	horizontal	HC	horizontal	HD	horizontal	HE	horizontal	HF	horizontal	HG	horizontal	HH	horizontal	HI	horizontal	HJ	horizontal	HK	horizontal	HL	horizontal	HM	horizontal	HN	horizontal	HO	horizontal	HP	horsepower	HPS	high performance steel	HS	high strength	HW	headwall, high water	HWM	high water mark	Hwy	highway	I	imported borrow	ID	inside diameter	IF	inside face	Int	interior	Invt	invert	Irr	irrigation	Jct	junction	JP	joint pole	JPCP	jointed plain concrete pavement	JS	junction structure	Jt	joint	K	key	L	length	Lat	latitude	LCB	lean concrete base	Ln	lane	Loc	location	LOL	layout line	Long	longitudinal	Longit	longitudinal	LS	lump sum	Lt	left
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IA	interior	IB	imported borrow	ID	inside diameter	IF	inside face	Int	interior	Invt	invert	Irr	irrigation	Jct	junction	JP	joint pole	JPCP	jointed plain concrete pavement	JS	junction structure	Jt	joint	K	key	L	length	Lat	latitude	LCB	lean concrete base	Ln	lane	Loc	location	LOL	layout line	Long	longitudinal	Longit	longitudinal	LS	lump sum	Lt	left
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ACRONYMS AND ABBREVIATIONS
(SHEET 1 OF 2)

NO SCALE

A10A

Appendix D Comment Letters and Email

STATE OF CALIFORNIA

ARNOLD SCHWARZENEGGER, Governor

DELTA PROTECTION COMMISSION
14215 RIVER ROAD
P.O. BOX 530
WALNUT GROVE, CA 95690
Phone (916) 776-2290 / FAX (916) 776-2283
e-mail: dpc@deltlink.net Home Page: www.delta.ca.gov

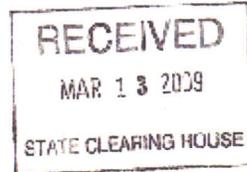


- Contra Costa County Board of Supervisors
- Sacramento County Board of Supervisors
- San Joaquin County Board of Supervisors
- Solano County Board of Supervisors
- Yuba County Board of Supervisors
- Association of Bay Area Governments
- Sacramento Area Council of Governments
- San Joaquin Council of Governments
- Central Delta Reclamation Districts
- North Delta Reclamation Districts
- South Delta Reclamation Districts
- West Delta Reclamation Districts
- Delta Authority
- Department of Docks and Waterways
- Department of Fish and Game
- Department of Food and Agriculture
- Department of Water Resources
- State Lands Commission
- State Parks
- Delta Landowner - Game Harvest
- Delta Landowner - Production Agriculture
- Delta Landowner - Wildlife Conservation

March 10, 2009

State Clearinghouse
PO Box 3044
Sacramento, California 95812-3044

Clear
3-11-09
late
e



SUBJECT: State Route 12 Shoulder Widening from Azevedo to Liberty Island Roads SCH# 2009022028

Dear Project Manager,

It has been brought to the attention of the Delta Protection Commission (Commission) that the California Department of Transportation proposes to upgrade State Route 12 to meet current Caltrans design standards. Although the planned project site is physically located outside of the Primary Zone of the Legal Delta, it provides material support for activities conducted in the Primary and Secondary Zones. Therefore, Commission staff urges your recognition of the Delta Protection Act (Act) and the policies of the Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta (Management Plan) in the review of this project pursuant to the requirements of the California Environmental Quality Act (CEQA).

The Act was enacted in 1992 in recognition of the increasing threats to the resources of the Primary Zone of the Delta from the urban and suburban encroachment having the potential to impact agriculture, wildlife habitat, and recreation. Pursuant to the Act, the Management Plan was completed and adopted by the Commission in 1995.

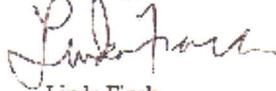
The Management Plan sets out findings, policies, and recommendations resulting from background studies in the areas of environment, utilities and infrastructure, land use, agriculture, water, recreation and access, levees, and marine patrol/boater education/safety programs. As mandated by the Act, the policies of the Management Plan are incorporated in the General Plans of local entities having jurisdiction within the Primary Zone, including Solano County.

Project Manager
March 10, 2009
Page Two

Therefore, it is recommended that review and analysis of the proposed project take into consideration relevance to the policies of the Management Plan, including but not limited to, Environment, Utilities and Infrastructure, and Land Use.

Thank you for the opportunity to comment on this matter of importance to the Delta. If you need additional information from the Commission, please contact me at (916) 776-2290.

Sincerely,



Linda Fiack
Executive Director



"Melissa Escaron"
<MESCARON@dfg.ca.gov>
04/20/2009 05:19 PM

To: <howell_chen@dcd.ca.gov>
cc: "Dianna Haraiz" <D-HARAIS@dfg.ca.gov>, "Melissa Escaron"
<MESCARON@dfg.ca.gov>
bcc:

Subject: State Route 12 shoulder widening EA 2ABZUC DECIA#
2006-0788

History: This message has been replied to and forwarded.

Hello Howell- I realize that the comment period has passed for this project. I wanted to suggest that burrowing owl surveys may be prudent given that there are occurrences within the vicinity. Please contact me if you would like to discuss further- Melissa

Melissa Escaron
Staff Environmental Scientist
California Department of Fish and Game
Cell: 707.339.0314
mescaron@dfg.ca.gov

Marcus Wagner
Caltrans District 4
P O Box 23660 Station 6E
Oakland, Ca. 94623

March 13, 2008

Dear Robert,

My brother and I own and operate the Hwy-12 Industrial park on the south side of Hwy-12, 2.5 miles west of Rio Vista. The intersection is Hwy-12 and Cattey Lane. There are 9 tenants which employ about 70 people or more in the busy season. Some of these business operate 6 day a week.

As the traffic on Hwy-12 increases it has become very difficult when going West to turn left on Cattey Lane into the Industrial Park . There have been several accidents at this intersection. The Trilogy stop light slows down some traffic but many vehicles do not Stop and are not prepared for anyone stopped on Hwy-12 at Cattey Lane to turn left.

Cal Trans plans to improve Hwy-12 from Azevedo road to Rio Vista some time between 2008 and 2010. I would like Cal Trans to include a left turn Lane at Cattey Lane when they do the improvements.

All of our tenants have asked me to have a left turn lane installed. They are very worried about the safety of there employees.

Sincerely,


ROBERT V CATTEY
4512 Green Valley Rd.
Fairfield, Ca. 94534
209 603-6765

Appendix E US Fish and Wildlife Biological Opinion



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846



In Reply Refer To:
81420-2009-F-0152-4

APR 30 2010

Mr. James Richards
California Department Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, California 94623-0660

Subject: Biological Opinion for the Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project, Solano County, California (Caltrans EA 2A620) on the Threatened Central Valley Distinct Population Segment of the California Tiger Salamander

Dear Mr. Richards:

This is in response to your November 3, 2008, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project in Solano County, California. Your request was received in our Sacramento field office on November 5, 2008, and included the request for formal consultation on the threatened Central Valley distinct population segment (DPS) of the California tiger salamander (*Ambystoma californiense*). This document represents the Service's biological opinion on the effects of the proposed action on this listed species which from herein will be referred to as the California tiger salamander. This document has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

Based on the results of 2008 focused surveys for Federal listed plants within the existing State Route 12 Caltrans right-of-way (ROW) portion of the proposed action area the Service has determined that the project is not likely to adversely affect the endangered soft bird's beak (*Cordylanthus mollis* ssp. *mollis*), endangered Contra Costa goldfields (*Lasthenia conjugens*) (goldfields), threatened Colusa grass (*Neostapfia colusana*), endangered Solano grass (*Tuctoria mucronata*), or endangered Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*). None of these Federal listed plants were found as a result of the April 14, May 4, and July 16, 2008, surveys led by botanist Ann Howald.

TAKE PRIDE
IN AMERICA 

Based upon the information provided, the Service has determined the proposed action may affect, and is not likely to adversely affect the threatened vernal pool fairy shrimp (*Branchinecta lynchi*), endangered Conservancy fairy shrimp (*Branchinecta conservatio*), and the threatened Delta green ground beetle (*Elaphrus viridis*).

The Service does not have sufficient information to concur that the proposed action is not likely to adversely affect the endangered vernal pool tadpole shrimp (*Lepidurus packardii*). The Service observed potential branchiopod habitat in the ponded areas up and downstream of, and within the box culvert near McClosky Road during the January 29, 2010, and February 5, 2010, visits to the proposed project site. Although a blue-line feature on the topographical map, this drainage system was characterized during the January and February 2010 field visits as a system of swales linked by areas of low water velocity. Based on our knowledge of occupied ponds, these ponds appeared to have the potential to support vernal pool tadpole shrimp. This assessment was made in the winter of 2010 following significant rain events.

According to Caltrans' 2008 fairy shrimp survey report, this ponded area was not sampled as part of the assessment of the proposed project's effects. The Service presumes that this area was not sampled during the protocol surveys because the 2008 rainfall conditions may not have been conducive to branchiopod habitat indicators, blue-line features are often not considered branchiopod habitat, and/or a lack of legal access.

The Service recommends that Caltrans conduct protocol branchiopod surveys of this area prior to construction. The Service recommends that the results of these surveys be submitted to the Service within ninety (90) calendar days prior to initial ground-breaking activities on the overall project. Caltrans should initiate formal consultation if listed species other than the California tiger salamander are encountered in order to be exempt from the prohibitions described under section 9 of the Act.

This biological opinion is based on: (1) a November 2008 Biological Assessment; (2) additional project information provided by the California Department of Transportation (Caltrans) on May 7, 2009; (3) May 2009, January 2010, and February 2010 field visits; (4) miscellaneous correspondence and electronic mail (email) messages concerning the proposed action between the Service and Caltrans from September 2008 to August 2009; and (5) other information available to the Service.

Consultation History

September 10, 2008 The Service received the *Ninety-Day Report for Listed Vernal Pool Branchiopods for the Caltrans Solano 12 Currie Road to Liberty Island Road Shoulder Widening Project*. The report was dated August 2008 and the accompanying cover letter was dated September 8, 2008.

- September 29, 2008 The Service received the *SR 12 (State Route 12) Currie Road to Liberty Island Road Shoulder Widening Project Ninety-Day Report for Federally Listed Fairy Shrimp Survey Results for the 2008 Dry Season*. The report was dated September 2008 and the accompanying transmittal was dated September 26, 2008.
- November 5, 2008 The Service received the biological assessment from Caltrans along with a November 3, 2008, cover letter that included a request to initiate formal consultation on the California tiger salamander.
- December 2, 2008 The Service sent an email message to Caltrans to inform them that the biological assessment was not adequate to complete formal consultation. Caltrans was informed that the Service was drafting an information request to outline the data needs necessary to complete formal consultation.
- December 5, 2008 The Service issued the *Information Request for the Completion of the Consultation for the Solano Highway 12 Currie Road to Liberty Island Road Shoulder Widening Project, Solano County, California (Caltrans EA 2A620)*, Service file number 81420-2009-F-0152-1.
- January 20, 2009 The Service received a Caltrans' response to the December 2008 information request. The response letter was dated January 15, 2009.
- February 19, 2009 The Service met with Caltrans to discuss their January 2009 response to the Services' December 5, 2008, request for additional information. Caltrans declined to provide a completed response because they challenged the Service's purpose and authority to ask for any information that was not pertinent to a jeopardy decision. The Service's primary outstanding request was for: (1) a comprehensive line item list of their conservation measures/Best Management Practices (BMPs); (2) the special-status plant survey report; (3) an assessment of effects to vernal pool habitat including a 250 foot buffer from the project footprint; and (4) the dimensions and locations of proposed modified culverts. Caltrans also informed the Service that the project would result in the acquisition of new right-of-way (ROW) that may not have been included in the described action area or project description.
- March 24, 2009 The Service attended a meeting with Caltrans to discuss strategies to facilitate efficient consultation on the project. Caltrans agreed to provide a revised response to the Service's December 2008 information request.
- May 7, 2009 The Service received an email message from Caltrans that included an attached copy of their *Supplemental Responses to Information Request for*

the Completion of the Consultation for Solano Highway 12 Currie Road to Liberty Island Road Shoulder Widening Project, Solano County, CA.

Three hardcopies of the document were received on May 11, 2009. The submitted information included: a January 23, 2008, habitat assessment for threatened and endangered invertebrates; an April 30, 2008, giant garter snake habitat assessment; and a September 2008, special-status plant survey report.

- May 20, 2009 The Service provided Caltrans with the project description section from the draft biological opinion for review via an attachment to an email message.
- May 21, 2009 The Service received design layout plans from Caltrans via an email message. Caltrans also informed the Service that the proposed project would require the acquisition of 5.46 acres of additional ROW that would be defined by a new ROW fence.
- May 22, 2009 The Service visited the project site with Caltrans to discuss the consultation status.
- May 27, 2009 The Service received an email message from Caltrans confirming that the additional 5.46 acres of required ROW acquisition was included in the approximately 13.62-acre action area described in the November 2008 Biological Assessment.
- May 29, 2009 The Service received a copy of Caltrans' revisions to the project description provided on May 20, 2009, via an attachment to an email message. In another email message received by the Service on the same day, Caltrans clarified that the proposed construction schedule would take 12 to 15 months.
- June 4, 2009 The Service received a digital copy of Caltrans GIS-generated map of the proposed project design superimposed on aerial photography.
- June 24, 2009 The Service informed Caltrans via an email message that the proposed 1:1 compensation to offset the effects to the California tiger salamander was not sufficient for the project and was not consistent with the 3:1 compensation that has been proposed by other applicants in Solano County and is included in the draft Solano County Habitat Conservation Plan (HCP).

June 24, 2009

To the above referenced email message, Caltrans responded that their proposed 1:1 compensation was based on the lack of California tiger salamander observations in the project area. Caltrans also stated that they are not obligated to be consistent with HCPs. To the Service's knowledge, the project area and the adjacent private land have never been surveyed for the species but are very similar to nearby habitat where the species is present. Caltrans stated in their habitat assessment that the project area contains suitable dispersal, aestivation, and breeding habitat for the California tiger salamander.

August 12, 2009

The Service provided information to Caltrans via an email message regarding potential California tiger salamander compensation at the 292-acre Thomas Ranch and the 1274-acre Peterson Ranch properties that are being pursued by the Solano Land Trust. In a second email message, the Service provided information regarding fencing material to direct California tiger salamanders towards culverts that could be used for safe passage by the species across State Route 12.

November 13, 2009

The Service received a letter from Caltrans dated November 10, 2009, in response to alternative design and compensation measures that were being explored by the staff Caltrans and Service biologists assigned to the Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project to minimize and avoid effects to the California tiger salamander.

In the letter Caltrans stated that the Service had proposed the additional measures beyond the regulatory deadline, however the purpose of the proposal was to find alternative solutions to the unresolved issues that were delaying the issuance of the biological opinion. In response to the proposed culvert upsizing, Caltrans modified the culvert design to facilitate a natural bottom substrate. Caltrans stated additional upsizing and the installation of box culverts to enhance California tiger salamander passage would not be consistent with the minor change rule. In regards to the installation of exclusion and directional fencing, Caltrans stated that they were unable to find convincing scientific data to support the measure, attaching additional fencing to their ROW fence would require additional ROW acquisition, and would not be consistent with the minor change rule. Caltrans maintained that culverts do not need to be designed to provide dry passage when water is flowing through the culverts because California tiger salamanders are an aquatic species. Caltrans stated that contributing to the Solano Land Trust's potential acquisition of nearby high quality California tiger salamander habitat would not be consistent with the minor

change rule and would not minimize effects incurred by the proposed State Route 12 project.

- January 7, 2010 The Service issued a letter to Caltrans in response to the November 10, 2009, correspondence.
- January 29, 2010 The Service visited the action area to observe ponding in and adjacent to the action area.
- February 5, 2010 The Service visited the action area to observe ponding in and adjacent to the action area and to assess the existing cross culverts in the action area for California tiger salamander passage across State Route 12.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description was provided by Caltrans with minor modifications for reasons of clarity and accuracy provided by the Service.

Caltrans proposes to modify the State Route 12 roadway from Liberty Island Road west to approximately 0.15 miles beyond Currie Road to allow for the addition of standard shoulder widths, a clear recovery zone, and left turn pockets at three intersections. The proposed project activities vary by segment as described below.

According to a May 29, 2009 correspondence from Caltrans, the project description provided in this biological opinion is based on 35 percent design. Caltrans will be required to reinitiate consultation when and if there are changes to the project description that exceed the effects described in this biological opinion.

Liberty Island Road to Azevedo Road

Construction activities within the approximately one mile stretch between Liberty Island Road and Azevedo Road on the east end of the alignment, will include widening of the existing road shoulder on each side of the roadway to an eight foot standard width. Widening will involve tree removal and extension of the box culvert at Well Creek. Caltrans proposes to install a sheet pile retaining wall extending from the east side of the Well Creek box culvert to minimize the intrusion of the roadway widening into the creek. Widening between Liberty Island Road and Azevedo Road will also require modification of existing drainage features, including but not limited to the upgrading of culverts and the re-establishment of existing longitudinal ditches. Roadway widening in this segment will include the replacement of one existing culvert, relocation of one existing culvert, and the extension of three existing culverts.

Caltrans will need to acquire additional ROW to facilitate the project widening and installation of the left turn lanes. This additional ROW will be needed on both sides of the State Route 12 roadway from Liberty Island Road to Azevedo Road. The widening will include the removal of approximately 44 trees, most of which are between Liberty Island Road to Azevedo Road. Probable staging for the project is available within the Caltrans ROW and the described action area at an existing stockpile area on the east end of the project near Liberty Island Road.

Azevedo Road to Currie Road

The remaining approximately two miles of roadway from Azevedo Road west to approximately 0.15 miles west beyond the Currie Road intersection already has standard eight-foot shoulders. Left turn lanes will be added in this segment at Curry Road (PM 20.6), McCloskey Road (PM 21.3), and Azevedo Road (PM 22.7). Work within this segment will not require tree removal. Work within existing cross drainages is limited to the extension of a box culvert at the unnamed ephemeral stream at McCloskey Road. Roadway widening in this segment will include the replacement of three existing culverts and the extension of two existing culverts. Caltrans will need to acquire additional ROW at the McCloskey Road box culvert area.

Culverts

The proposed project will include replacement of four existing undersized culverts, the relocation of one existing culvert, and extension of five existing culverts to facilitate the shoulder widening.

These circular, galvanized steel culvert replacements will be upsized from the existing two year flood event dimensions to 25 year flood event dimensions. One 18-inch diameter culvert will be replaced with a 24-inch culvert, and two 12-inch culverts and one 15-inch culvert will be replaced with 18-inch culverts. The culverts to be replaced will be saw-cut, excavated, and removed. A self-compacting base and the new culverts will be laid with slurry backfill to existing asphaltic-concrete and patched with asphaltic-concrete to grade. All replacement culverts will be at least 20 percent larger than the pre-existing feature and flush with the existing grade on the up and downstream ends. According to Caltrans' November 10, 2009 letter to the Service, the culverts will be designed to facilitate the formation of a natural bottom substrate.

One existing ten-inch culvert, crossing beneath a private driveway access to State Route 12, will be relocated further up the private driveway and the crossing reestablished to accommodate the shoulder widening.

The five culvert extensions will be limited to the attachment of identical diameter culvert piping to the existing culverts to accommodate the new roadway width and the extension of the ten-foot by six-foot double box culvert at Well Creek. The extension of the Well Creek box culvert will also include the addition of concrete barriers to the outside shoulders of the roadway. The extension will require limited excavation of the existing drainage bed on either side of the existing culvert to lay the extensions flush with the grade.

Bio-filtration Devices

Caltrans will be constructing bio-filtration strips (biostrips) adjacent to the road shoulders in order to meet Regional Water Quality Control Board waste discharge requirements. The bio-filtration strips are broad vegetated surfaces designed to receive and discharge storm water as sheet flow from the roadway. Unlike bio-filtration swales (bioswales), biostrips are relatively flat areas that slope away from the roadway and are not designed for conveyance or to facilitate ponding. Biostrips are designed to remove pollutants by filtration through the vegetation, sedimentation, adsorption to soil particles, and infiltration through the soils. Bio-filtration strips are also effective at trapping litter, Total Suspended Solids, and particulate metals. The biostrips for the proposed project will be located within the Caltrans ROW and the described action area. Biostrips do not replace existing parallel road-side ditches. Instead, biostrips are physically placed between the shoulder and the parallel road-side ditch, biofiltering the roadway sheet flow as it leaves the roadway surface before entering the drainage ditches.

Biostrips have yet to be fully incorporated into the design plans and exact placement for optimal effectiveness has yet to be determined, since the project design is only at 35 percent. It has been determined that biostrips will be located within the described action area and will provide 100 percent coverage of all additional impervious surface created by the proposed project and all water credits have been obtained from the Caltrans Office of Water Quality. Typical biostrips are designed with a fore slope (i.e., the slope adjacent to the roadway) of 4:1, minimally, and a back slope of 2:1. The biostrips vegetative cover will be maintained at a height of approximately four to six inches for optimal biofiltering. There is no maximum depth for biostrips, however, the depth is limited by existing topography along the roadway and designed to be as long and flat as the site will allow, which maximizes treatment efficiency. Biostrips are not "deep ripped" or "over excavated."

Caltrans noted in their May 7, 2009, letter that the final design may be amended to incorporate bioswales. Bioswales convey storm water in shallow vegetated ditches designed to maximize percolation and minimize ponding. Bioswales are designed to a typical cross-sectional depth of one to two feet, six inch depth flow, and ten minute maximum hydraulic residence time. Caltrans will either request technical assistance from the Service or reinitiate formal consultation, if there is a significant change in the project description included in this biological opinion.

Utilities

The proposed project is expected to include utility relocations. Underground gas lines, telecommunication fiber optic lines, and electrical lines currently located in the Caltrans ROW may need to be relocated to accommodate the widening. The new alignments and distribution pole placements will be determined by the utility companies during later stages of the overall project design. However, the relocations will remain within the newly proposed ROW and within the described action area. Overhead transmission towers are anticipated to remain in place through the use of a design exception or guardrail placement. Caltrans will either request technical assistance from the Service or reinitiate formal consultation if there is a significant change in the project description included in this biological opinion.

Construction Methods

Construction equipment that will likely be needed to complete the proposed project includes graders, excavators, a crane, a vibratory sheet pile driver, an asphalt drum grinder, transfer and bottom dump semi-trucks and trailers, lowboy-style trucks and trailers, cement trucks, Gradall – style articulating four-wheel-drive forklifts, front-end loaders, vibramatic rollers, a hydro-seeding truck rig, and various pick-up trucks.

Construction signage will be installed at the east and west ends of the proposed project and California Highway Patrol COZEEP¹ operations will be in place prior to onset of any construction activity. One of the first orders of work will be placement of fencing to identify the action area limits and sensitive environmental areas. Left turn pockets and the Well Creek box culvert bridge extension will be installed prior to general roadway widening. The second order of work will be sheet pile bank-retaining wall installation, grading and shoulder excavations, along with roadway pavement repairs, and culverts replacement and extensions. Lastly, the asphalt overlay of the widened and repaired roadway will complete the project.

Box culvert replacement will involve the placement of false work and concrete forms in the drainage at McCloskey Road and in Well Creek. Corrugated Steel Pipe (CSP) replacements and culvert extensions will involve excavation (culvert removal at replacement locations) and installation of gravel bedding prior to new CSP placement followed by back-filling of the excavated area with either slurry or concrete prior to placement of an asphalt concrete patch over the excavated area. Spalling (cracking) and existing roadway pavement failures will be repaired by grinding out the damaged sections of roadway, making any sub-base repairs and placement of an asphalt concrete patch to match the existing road grade. The sheet pile retaining wall will be installed using a crane to lift sections of sheet pile into place before being mechanically driven or vibrated into the ground to the desired tip elevation. Each section of sheet pile mechanically locks into the edge of the previously placed section to create the retaining wall. Minor back-filling behind the retaining wall will prepare the area for the roadway widening. The last series of operations will involve placement of several lifts of asphaltic concrete to bring the final widening to the correct crown followed by replacement of the soft median barrier, road striping, and hydro-seeding.

Construction Schedule

Caltrans plans to begin construction in spring of 2011 and the work is expected to take 12 to 15 months.

Construction Site Restoration

Caltrans plans to restore areas of temporary ground disturbances, including storage and staging areas, and temporary roads. These areas will be re-contoured, if appropriate, and revegetated

¹ Construction Zone Enhanced Enforcement Program (COZEEP): improves project safety through the use of supplemental California Highway Patrol (CHP) Units to assist in the management of traffic passing through the construction zone. COZEEP involves the presence of the CHP in certain construction zones to serve as a reminder to the motoring public to slow down, observe construction zone signs, and use care while driving through the work zone.

with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. Caltrans defines areas of “temporary” disturbance to be any area that is disturbed during the project, but that after project completion will only be subject to standard operation and maintenance activities such as mowing and has the potential to be revegetated. To the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species.

Proposed Conservation Measures

According to their November 2008, Biological Assessment and the May 7, 2009, supplemental response, Caltrans proposes to avoid, minimize, and compensate for effects to listed species by implementing the following measures:

1. Caltrans will compensate for their effects to individual California tiger salamanders utilizing the 13.62-acre action area with the purchase of 13.62 acres of California tiger salamander habitat credits at a Service-approved conservation bank. Refer to the *Term and Condition 2n* for additional information on appropriate minimization through habitat acquisition.
2. A Service-approved biologist(s) will be designated for the activities that will affect California tiger salamander habitat which has been defined as the entire 13.62-acre project area. The qualified biologist(s) will be on-site during specific construction activities that may reasonably result in the take of the California tiger salamander. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the project site. The biologist(s) will coordinate through the Resident Engineer, to stop any work that may result in take of the California tiger salamander. If work is stopped, the biologist(s) will notify the Service by telephone and electronic mail within one (1) working day.
3. The Resident Engineer will halt work and immediately contact the Service-approved project biologist(s) and the Service in the event that a California tiger salamander gains access to a construction zone. The Resident Engineer will suspend construction activities within a 50 foot radius of the indentified animal that could reasonably result in a take of a California tiger salamander until the animal leaves the site voluntarily or is removed by the biologist(s) to a release site using Service-approved handling techniques. Information regarding California tiger salamander handling, transport, and release are included in *Term and Condition 2j*.
4. All construction supervisory personnel will attend an environmental education program delivered by the Service-approved biologist prior to working on the project site. The program will include an explanation as how to best avoid take of the California tiger salamander. The Service approved biologist(s) will conduct a training session that will be

- scheduled as a mandatory informational field meeting by the Caltrans Resident Engineer for all construction contractor supervisory personnel. The field meeting will include topics on species identification, life history, descriptions, and habitat requirements during various life stages. Emphasis will be placed on the importance of the habitat and life stage requirements within the context of project maps showing areas where minimization and avoidance measures are being implemented. The program will include an explanation of Federal and State laws protecting the California tiger salamander as well as the importance of compliance with Caltrans and various resource agency conditions.
5. No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for the California tiger salamander. These surveys will consist of walking surveys of the project limits and accessible adjacent areas to determine presence of the species. The biologist(s) will investigate all potential California tiger salamander cover sites. This includes thorough investigation of mammal burrows, appropriately sized soil cracks, and debris. The entrances and other refuge features will be collapsed or removed following investigation.
 6. Should a California tiger salamander be found at the project site, an on-call consultant with the appropriate section 10(a)(1)(a) permit to handle the California tiger salamander will be utilized. Caltrans will submit the name and credentials of the Caltrans staff biologist(s) and the name and permit number of the on-call consultant to the Service prior to ground breaking on the project. Information regarding California tiger salamander handling, transport, and release are included in *Term and Condition 2j*.
 7. For work that could reasonably result in a take of a California tiger salamander, a Service-approved biologist(s) will be on-site to monitor the initial ground disturbance activities for the road construction. The biologist(s) will perform a clearance survey immediately prior to the initial ground disturbance. Safety permitting, the Service-approved biologist(s) will investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.
 8. To minimize temporary disturbances in areas of California tiger salamander habitat, project related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also will be included in pre-construction surveys and, to the maximum extent practicable, will be established in locations disturbed by previous activities to prevent further adverse effects. Project related vehicles will observe a 20-mile per hour speed limit, except on County roads, and State and Federal highways. Off-road traffic outside of designated action areas for construction phases with potential California tiger salamander habitat will be prohibited. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and Storm Water Pollution Prevention Plan (SWPPP).

9. Work in the vicinity of water crossings will be scheduled to occur between May 15th and October 15th.
10. Temporary effects are those activities that are ancillary to permanent construction features and disturb an area for a specific limited period and which can be restored to pre-disturbance-type conditions prior to the beginning of the following year's rainy season (e.g. October 15). Areas temporarily affected by the State Route 12 Project will typically be restored after a single construction season. Where temporary soil disturbance occurs, Caltrans standard erosion control practices will restore cover prior to winter rains and within a single California tiger salamander breeding season. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
11. Dust control measures will consist of regular truck watering of construction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. In addition, for disturbed soil areas, an organic tackifier to control dust emissions blowing off of the ROW or out of the construction area during construction will be included in the contract special provisions. Watering guidelines for dewatering will be established to avoid any excessive run-off that may flow into contiguous areas. Any material stockpiles will be watered, sprayed with tackifier or covered, to minimize dust production and wind erosion. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
12. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
13. To eliminate an attraction to predators of the California tiger salamander, 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 action area. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
14. To avoid injury or death of a California tiger salamander, no firearms will be allowed in the action area except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs.
15. To prevent harassment, injury or mortality of a California tiger salamander or destruction of their refuge areas, no pets will be permitted in the action area. This measure will be

implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.

16. Use of rodenticides and herbicides in the action area will be used in such a manner to prevent primary or secondary poisoning of a California tiger salamander and the depletion of vegetation on which they depend. All uses of such compounds will observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other appropriate State and Federal regulations, as well as additional project-related restrictions deemed necessary by the Service or the California Department of Fish and Game. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
17. Dedicated fueling and refueling practices will be designated as part of the approved SWPPP. Dedicated fueling areas will be protected from storm water run-on and run-off and will be located at least 50 feet from downslope drainage facilities and water courses. Fueling must be performed on level-grade areas. On-site fueling will only be used where it is impractical to send vehicles and equipment off-site for fueling. When fueling must occur on-site, the contractor will designate an area to be used subject to the approval of the Caltrans Resident Engineer. Drip pans or absorbent pads will be used during on-site vehicle and equipment fueling. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
18. 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. Additional water quality protection measures required by other permits such as the California Department of Fish and Game's Lake and Streambed Alteration Agreement and the Regional Water Quality Control Board's 401 certification will be implemented. Caltrans SWPPP and 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 acres 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 is referenced to 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 location: <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. Restoration of work areas where temporary disturbance has removed the pre-existing vegetation and re-seeding with a native seed mix.
 - g. Protection of graded areas 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 on sloped areas.
 - 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.
19. Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because California tiger salamander may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
20. 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. This measure will be implemented through contractors and subcontractors as part of the Caltrans standard BMPs and SWPPP.
21. The limits of the construction zones will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto sensitive areas during construction activities.

The fencing will be removed only when all construction equipment is removed from the site. Activities within the action area will be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

22. Construction activity within the action area will be limited to vehicle and equipment operation within the Caltrans ROW and temporary construction easements unless otherwise noted.
23. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans will allow access by Service personnel to the action area to inspect project effects to California tiger salamanders and their habitats. Caltrans requests that all agency representatives contact the Resident Engineer prior to accessing the work site and review and sign the Safe Work Code of Practices, prior to accessing the work site for the first time.
24. The following will be implemented for staging, storage sites, vehicle parking, and access associated with the project:
 - a. Contractors may independently seek off-site staging locations. Offsite staging locations will be subject to the requirements of resource agencies and permits will be the responsibility of the contractor.
 - b. Caltrans will require as part of the construction contract that all contractors comply with the Act in the performance of the work as described in the project description of this biological opinion and conducted within the action area.
 - c. If a staging, storage, access, or vehicle parking area that is in compliance with the Act is not available, the agency with jurisdiction and the contractor would be responsible for compliance with the Act.

Analytical Framework for the Jeopardy Determination

The following analysis relies on four components to support the jeopardy determination for the California tiger salamander: (1) the *Status of the Species*, which evaluates the species' rangewide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the species' current status and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the species and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the action area includes the direct effects associated with the approximately three-mile long, 13.62 acre construction footprint and the indirect effects within 1.3 miles of the construction footprint. As described in the following sections, the life history of the California tiger salamander can include long distance seasonal movements. Given the locations of potential breeding and upland habitat relative to the proposed construction footprint and our current knowledge of California tiger salamander movement, the action has the potential to adversely affect California tiger salamanders moving across the road that inhabit underground retreats at least 2200 feet and up to 1.3 miles from any given location from the proposed construction footprint.

Status of the Central Valley DPS of the California Tiger Salamander

The Central Valley DPS of the California tiger salamander was listed as a threatened species on August 4, 2004 (Service 2004b). Please refer to the final listing and final critical habitat rule for additional information on this species.

The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Adults may reach a total length of 8.2 inches (Petranka 1998). California tiger salamanders exhibit sexual dimorphism with males typically larger than females. The coloration of the California tiger salamander is white or yellowish markings against black. As adults, California tiger salamanders tend to have creamy yellow to white spotting on the sides with much less on the dorsal surface of the animal, whereas other tiger salamander species have brighter yellow spotting that is heaviest on the top of the animals. California tiger salamander larvae have yellowish gray bodies, broad fat heads, large feathery external gills, and broad dorsal fins extending well up their back and range in length from approximately 0.45 to 0.56 inches (Petranka 1998).

The California tiger salamander has an obligate biphasic life cycle (Shaffer et al. 2004). Although larval California tiger salamanders develop in vernal pools and ponds in which they were born, they are otherwise terrestrial salamanders that spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer et al. 2004; Trenham et al. 2001). Subadult and adult California tiger salamanders spend the dry summer and fall months of the year in the burrows of small mammals, such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). The burrows provide protection from the sun and wind that can cause desiccation (drying out) of amphibian skin. Camel crickets (*Ceuthophilus* spp. and *Pristoceuthophilus* spp.) and other invertebrates within these burrows are likely prey for California tiger salamander. California tiger salamanders are also known to take refuge in logs, debris piles, and cracks in the ground (Holland et al. 1990). Not much is known about California tiger salamander feeding behavior but it is likely that they forage opportunistically in upland habitat in addition to documented feeding while in burrows and in breeding ponds (personal communication with Peter Trenham, April 7, 2010).

Tiger salamanders are members of the Family Ambystomatidae (mole salamanders); although members of this family are known as "burrowing salamanders," California tiger salamanders are not known to create their own burrows in the wild, perhaps due to the hardness of soils in the California ecosystems in which they are found. Because they live underground in the burrows of mammals, they are rarely encountered in the uplands by humans even where they are abundant. Recent surveys performed within the East Bay Regional Parks District (EBRPD) have demonstrated that California tiger salamanders may utilize less than 50 percent of suitable breeding habitat during any given year. This data indicates that even in ponds where the species appears to have been extirpated, regular breeding activities may still occur (Bobzien and DiDonato 2007). Burrows may be active (in use by small mammals) or inactive (small mammals are absent), but because burrows tend to be short lived without continued small mammal activity, they typically collapse within approximately 18 months if not maintained (Loredo et al. 1996). An active population of burrowing mammals is necessary to sustain sufficient underground refugia for the species. California tiger salamanders also may utilize leaf litter or desiccation cracks in the soil.

The upland burrows inhabited by California tiger salamanders have often been referred to as "aestivation" sites, which implies a state of inactivity, however, recent studies show that the animals move, feed, and remain active in their burrows (Trenham 2001; Van Hattem 2004). Researchers have long inferred that they are feeding while underground because the animals arrive at breeding ponds in good condition and are heavier when entering a pond than when leaving. Thus, upland habitat is a more accurate description of the terrestrial areas used by California tiger salamanders.

Once fall or winter rains begin, California tiger salamanders emerge from the upland sites on rainy nights to feed and to migrate to the breeding ponds (Stebbins 1985, 1989; Shaffer et al.

1993). Adult California tiger salamanders mate in the breeding ponds, after which the females lay their eggs in the water (Twitty 1941; Shaffer et al. 1993; Petranka 1998). Historically, California tiger salamanders utilized vernal pools, but the animals also currently breed in livestock ponds. Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). In ponds with no or limited vegetation, they may be attached to objects, such as rocks and boards on the bottom (Jennings and Hayes 1994). California tiger salamander populations at eastern San Francisco Bay locations may have higher reproductive success in ponds with limited to no emergent vegetation, potentially due to a reduced number of aquatic predators that rely on more highly shaded areas (Bobzien and DiDonato 2007). After breeding, adults leave the pool and return to the small mammal burrows (Loredo et al. 1996; Trenham 1998a), although they may continue to emerge nightly for approximately the next two weeks to feed (Shaffer et al. 1993). In drought years, the seasonal pools may not fill and the adults can not breed (Barry and Shaffer 1994).

California tiger salamander eggs hatch in two to four weeks (Storer 1925; Shaffer and Trenham 2004). The larvae are aquatic with yellowish gray coloration and have broad fat heads, possess large, feathery external gills, and broad dorsal fins that extend well onto their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks post hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae are known to consume tadpoles of Pacific tree frogs (*Pseudacris regilla*) and California red-legged frogs (*Rana aurora draytonii*) (J. Anderson 1968; P. Anderson 1968). The larvae are among the top aquatic predators in their seasonal pool ecosystems. Larval California tiger salamanders often rest on the bottom in shallow water; they may also be found at varying depths in locations where deep water is available. Young California tiger salamanders are typically wary and will often escape into vegetation on the bottom of the pool when approached by potential predators (Storer 1925).

The larval stage of the California tiger salamander usually last three to six months, as most seasonal ponds and pools dry up during the summer (Petranka 1998). The peak emergence of these metamorphs is typically between mid-June to mid-July (Loredo and Van Vuren 1996; Trenham et al. 2000) but in some areas as early as late February or early March. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Individuals collected near Stockton in the Central Valley during April varied from 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left the breeding pools 60 to 94 days after the eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. The longer the ponding duration, the larger the larvae and metamorphosed juveniles are able to grow, and the more likely they are to survive and reproduce (Pechmann et al. 1989; Semlitsch et al. 1988; Morey 1998; Trenham 1998b). The larvae will perish if a site dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann et al. (1989) found a strong positive correlation with ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 pools sampled supported larval California tiger salamanders, and five of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only six (20 percent)

provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch et al. 1988; Scott 1994; Morey 1998). In the late spring or early summer, before the ponds dry completely, metamorphosed juveniles leave ponds and enter upland habitat. This emigration occurs in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo et al. 1996). Unlike during their winter migration, the wet conditions when adult California tiger salamanders typically move do not generally occur during the months when their breeding ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under these conditions, they may move only short distances to find temporary upland sites for the dry summer months, waiting until the next winter's rains to move further into suitable upland refugia. Once juvenile California tiger salamanders leave their birth ponds for upland refugia, they typically do not return to ponds to breed for an average of four to five years (Trenham et al. 2000). However, the minimum age at sexual maturity has been observed to be two years for males and two to three years for females (Loredo and Van Vuren 1996; Trenham et al. 2000). Individuals remain active in the uplands, coming to the surface during rainfall events to disperse or forage (Trenham et al. 2000).

Lifetime reproductive success for California tiger salamanders is low. Trenham et al. (2000) found the average female bred 1.4 times and produced 8.5 young that survived to metamorphosis per reproductive effort. This resulted in roughly 11 metamorphic offspring over the lifetime of a female. Data suggests that the two reasons for the low reproductive success are that most individuals require two years to become sexually mature, but some individuals may be slower to mature (Shaffer et al. 1993); and some animals do not breed until they are four to six years old. While individuals may survive for more than ten years, many breed only once, and in some populations, less than five percent of marked juveniles survive to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well as from anthropogenic factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) inter-pond dispersal. Breeding migration is the movement of California tiger salamanders to and from a pond and the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. During a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/ birth pond to breed, while 20 percent dispersed to other ponds (Trenham et al. 2001). Following breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before breeding again (Trenham et al. 2000).

California tiger salamanders are known to travel long distances from breeding sites into upland habitats. Maximum distances moved are generally difficult to establish for any species, but California tiger salamanders in Santa Barbara County have been recorded to disperse 1.3 miles

from breeding ponds (Sweet 1998). California tiger salamanders are known to travel between breeding ponds; one study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at ponds approximately 1,900 and 2,200 feet away (Trenham et al. 2001). In addition to traveling long distances during migration to or from ponds, California tiger salamanders may reside in burrows or other cover sites that are far from ponds. At one site in Contra Costa County, hundreds of California tiger salamanders have been captured three years in a row in upland habitat approximately 0.75 miles from the nearest breeding pond (Orloff 2003).

Although the observations above indicate that California tiger salamanders have the capacity for long distance movements, typically they stay closer to breeding ponds. Evidence suggests that subadult California tiger salamanders disperse further into upland habitats than adults. A trapping study conducted in Solano County during winter of 2002/2003 found that subadults used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More subadults were captured at distances of 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Large numbers, approximately 20 percent of total captures, were found 1,312 feet from a breeding pond. Fitting a distribution curve to the data revealed that 95 percent of subadult at their study site could be found within 2,067 feet of the pond, with the remaining five percent being found at even greater distances. Results from the 2003-04 trapping efforts detected subadult California tiger salamanders at even further distances, with a large proportion of the total California tiger salamanders caught at 2,297 feet from the breeding pond (Service 2004a). Most subadults captured, even those at 2,100 feet, were still moving away from ponds (Service 2004a). This data suggests that many California tiger salamanders travel long distances while still in the juvenile/subadult stage. Post-breeding movements away from breeding ponds by adults appear to be much shorter. During post-breeding emigration, radio-tracked adult California tiger salamanders were located in burrows 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders having depleted physical reserves post-breeding, or also due to the drier weather conditions that can occur during the period when adults leave the ponds.

Although the distances that California tiger salamanders may move likely depend on life stage, the location of available refugia and breeding ponds, presence of natural and constructed barriers, habitat continuity, climate conditions, individual propensities, and other factors, movements and dispersal corridors likely are critical to California tiger salamander population dynamics, particularly because the animals likely currently persist as metapopulations² with disjunct population centers.

California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously sited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults favored grasslands with scattered large oaks, over more densely wooded areas. The same study showed

² A metapopulation consists of a group of spatially separated populations of the same species which interact at some level.

no indication that certain habitats type are favored as terrestrial travel corridors over others (Trenham 2001). In addition, at two ponds completely encircled by drift fences and pitfall traps, captures of arriving adults and dispersing new metamorphs were distributed roughly evenly around the ponds. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Historically, California tiger salamanders inhabited low elevation grassland and oak savanna plant communities of the Central Valley, and adjacent foothills, and the inner Coast Ranges in California (Jennings and Hayes 1994; Storer 1925; Shaffer et al. 1993). The species has been recorded from near sea level to approximately 3,700 feet in the Coast Ranges and up to about 1,600 feet in the Sierra Nevada foothills (Shaffer et al. 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County south to the vicinity of Buellton in Santa Barbara County. In the Central Valley and surrounding foothills, the species occurred from northern Yolo County southward to northwestern Kern County and northern Tulare County. Three distinct California tiger salamander populations are recognized and correspond to the Santa Maria area within Santa Barbara County, the Santa Rosa Plain in Sonoma County, and vernal pool/grassland habitats throughout the Central Valley.

With continued habitat loss, degradation, modification, and fragmentation, the California tiger salamander is still encountered in areas where their archetypical habitat is no longer found. It is not uncommon to find California tiger salamanders breeding in stock ponds or taking refuge under structural foundations. A large adult female California tiger salamander was recently found in the Caltrans ROW during construction of a State Route 680 project (Caltrans EA 04-253751) in Alameda County (Derek Jansen, URS, pers. comm. on May 5, 2009). The California tiger salamander emerged from a burrow at the base of an overpass. The burrow was located in a disturbed area composed of fill material and separated from the nearest potential breeding pond, approximately 500 feet away, by a fenced storage area, four paved roads, road curbs, and a drainage ditch. These features are older than the salamander. This observation is also contrary to distribution provided in the Service's listing document which states that the listed salamander generally does not occur west of State Route 680 in Alameda and Contra Costa Counties (Service 2004a). California tiger salamanders have the potential to persist in disturbed areas as long as it provides at least one or more of their life history requirements. Our understanding of current distribution is incomplete.

Documented and/or potential predators on California tiger salamanders include coyotes (*Canis latrans*), raccoons, striped skunks, opossums (*Didelphis virginiana*), egrets (*Egretta* spp.), great blue herons (*Ardea herodias*), crows (*Corvus brachyrhynchos*), ravens (*Corvus corax*), garter snakes (*Thamnophis* spp.), bullfrogs (*Rana catesbeiana*), California red-legged frogs, mosquito fish, and crayfish (*Procrampus* spp.). In addition, predacious aquatic hexapods (arthropods) have also been shown to have a significant negative association with California tiger salamanders (Bobzien and DiDonato 2007). Domestic dogs (*Canis familiaris*) have been observed eating California tiger salamanders at Lake Lagunitas at Stanford University (Sean Barry, ENTRIX, pers. comm. July 2004).

Diseases may pose a significant threat though the specific effects of disease on the California tiger salamander are not known. Pathogens, fungi, water mold, bacteria, and viruses have been known to adversely affect other tiger salamander species and/or other amphibians. Pathogens are suspected of causing global amphibian declines (Davidson et al. 2003). Pathogen outbreaks have not been documented in the California tiger salamander, but chytrid fungus infections (chytridiomycosis) have been detected in California tiger salamander (Padgett-Flohr and Longcore 2005). Chytridiomycosis and ranaviruses are a potential threat to the California tiger salamander because these diseases have been found to adversely affect other amphibians, including tiger salamanders (Davidson et al. 2003; Lips et al. 2003). A deformity-causing infection, possibly caused by a parasite in the presence of other factors, has affected pond-breeding amphibians at known California tiger salamander breeding sites. This same infection has become widespread among amphibian populations in Minnesota and poses the threat of becoming widespread in California. Non-native species, such as bullfrogs and non-native tiger salamanders, are located within the range of the California tiger salamander and have been identified as potential carriers of these diseases. Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e. contaminated boots or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in California tiger salamanders being more susceptible to the effects of disease. Disease will likely become a growing threat because of the relatively small and fragmented remaining California tiger salamander breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes that have occurred both inside and outside the species' range.

Environmental Baseline for the Central Valley DPS of the California Tiger Salamander

The California tiger salamander is imperiled throughout its range by a variety of human activities (Service 2004b). Current factors associated with declining populations of the California tiger salamander include continued degradation and loss of habitat due to agriculture and urbanization, hybridization with non-native eastern tiger salamanders (*Ambystoma tigrinum*) (Fitzpatrick and Shaffer 2004; Riley et al. 2003), and introduced predators. Fragmentation of existing habitat and the continued colonization of existing habitat by non-native tiger salamanders (and other species) may represent the most significant current threats to California tiger salamanders, although populations are likely threatened by more than one factor. Isolation and fragmentation of habitats within many watersheds have precluded dispersal between sub-populations and jeopardized the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are capable of colonizing or "rescuing" extinct habitat patches). Other threats include predation and competition from introduced exotic species, possible commercial over utilization, various chemical contaminants, road-crossing mortality, and certain unrestrictive mosquito and rodent control operations. The various primary and secondary threats are not currently being offset by existing Federal, State, or local regulatory

mechanisms. The California tiger salamander is also vulnerable to chance environmental or demographic events, to which small populations are particularly vulnerable.

The land adjacent to the project area is under private ownership and is primarily undeveloped, other than widely spaced ranch homes. The project area occurs within Solano County jurisdiction and is zoned primarily for extensive agricultural uses.

The State Route 12 corridor in the Fairfield-Suisun-Rio Vista area has experienced rapid growth over the last several decades. The Association of Bay Area Governments (ABAG) anticipates continued growth in Solano County and expects the County to lead the Bay Area in percentage growth of both population and jobs through 2020. The California Department of Finance projects that Solano County's population will increase from 399,000 in 2000, to 564,900 by 2020, with most growth occurring within the County's three largest cities, Vallejo, Fairfield, and Vacaville. Rio Vista, while still a relatively small community, has led Solano County growth (on terms of percentage growth rate) for the last few years (LSA 2005). Increased demand for housing will likely result in loss of suitable habitat for the California tiger salamander as housing developments replace agricultural and ranch lands. Increased urbanization in the region will contribute to the degradation of water quality in streams, altered flow regimes, increased contaminated road runoff, loss of upland habitat, and increased human presence in natural areas.

As urban development continues, it will likely adversely affect upland areas that serve as dispersal and refuge habitat for California tiger salamanders. Continued development, modification, and maintenance of roadways to serve expanding urban areas may further fragment and isolate populations of California tiger salamanders from other nearby populations. Increased predation associated with domesticated pets or feral animals generally accompanies urban expansion. As urban development encroaches on rural areas, the need increases for mosquito abatement programs that may introduce exotic fish into ponds used for breeding by this listed salamander, thus impacting the reproductive success of this species.

The western terminus of the proposed State Route 12, Currie Road to Liberty Island Project (approximately 0.15 miles west of Currie Road) is approximately 4.25 miles south of the nearest California tiger salamander designated critical habitat unit, the Central Valley Region Unit 2 (Service 2004b). The project is within a rural area with few homes and relatively few paved roads. Heavy row crop agricultural development is primarily located east around the town of Rio Vista and approximately four miles north of the action area. For the most part the surrounding habitat north to previously mentioned disked fields, south to the Montezuma Hills, and northwest to Travis Air Force Base (AFB) is characterized by contiguous open grassland laced with ephemeral creeks and vernal pool hydrology. Some of the surrounding land has been subject to disking but the vernal pool signatures are still visible on aerial photography. The vast majority of this area is privately owned and grazed with relatively little recent development pressure. As a result, few biological surveys have been conducted in this general region. The proposed project is also located outside the City of Rio Vista urban growth limit. Based on the habitat similarities suggested by aerial photography and species occurrences from areas surrounding Travis AFB, including approved and proposed conservation banks, a host of vernal pool and grassland

associated listed species have the likelihood to be found throughout the general vicinity of the proposed project area. The entire project is located within the Jepson Prairie Vernal Pool Core Recovery Area (Service 2005).

The closest recorded California tiger salamander observation is from a 2009 survey associated with the Shiloh III Wind Project in the Montezuma Hills (personal communication with Brad Schafer of ICF Jones and Stokes, August 13, 2009). This observation was the result of a larval survey of a pond located approximately 0.7 miles south of State Route 12 and approximately 3.4 miles west-southwest of the western end of the proposed project. California tiger salamanders have been recently recorded in the Calhoun Cut Ecological Reserve (CNDDDB 2009, occurrence # 547) approximately 6.9 miles northwest of the action area and within the Central Valley Region Critical Habitat Unit 2, approximately 4.25 miles northwest of the project where Brad Shaffer's laboratory out of the University of California has been conducting long running California tiger salamander research on the Jepson Prairie (CNDDDB 2009). Another California tiger salamander was observed south of State Route 12 in 2007 as a result of surveys conducted in the Potrero Hills wind resource area (CNDDDB 2009, occurrence #1037). Of note, this salamander was observed in a recently disced field and the record is approximately 4.45 miles west-southwest of the action area. California tiger salamanders have also been observed in stock ponds in the Potrero Hills approximately 8.0 miles west of the western terminus of the action area and south of State Route 12 as a result of surveys completed for a proposed landfill expansion (CNDDDB 2009). Conservation land for the California tiger salamander has been proposed in the Potrero Hills by the Potrero Hills Landfill (LSA 2007). One of the proposed mitigation areas is immediately adjacent to State Route 12. Relative to the action area, these observations are beyond the known dispersal distance for an individual California tiger salamander however they demonstrate that this listed species is observed in the few areas in the general vicinity where protocol surveys have been conducted. The Service visited the action area on January 22, 2010, and found several large well inundated seasonal ponds within 0.5 miles of the construction footprint as well as a characteristic California tiger salamander breeding pond within the action area. This January 2010 visit was conducted following a full week of substantial rain, which is an optimal time to assess the locations of potential California tiger salamander breeding ponds. The California tiger salamander is likely to be breeding in vernal pools, stock ponds, and other water retention features within 1.3 miles of the action area.

The proposed project is within the coverage area for the Draft Solano County Multispecies Conservation Plan (Solano County HCP) (SWCA 2009). The draft Solano County HCP characterizes the action area as part of a large contiguous Valley Floor Grassland and Vernal Pool Community that is within the potential range of the California tiger salamander. Caltrans is not one of the member agencies participating in the HCP and its activities would not be covered under the HCP, however, reference to the HCP is relevant because it represents the culmination of the best available science and conservation strategy for the region and the special-status species within its coverage. As part of the reserve design and conservation approach presented in the draft HCP, the action area is located approximately 0.06 to 0.44 miles south of an area identified as having high preservation and restoration potential for grassland and vernal pool

habitat and the species associated with them. The HCP includes prescribed sub-regional mitigation requirements that are intended to meet the goals and objectives of the conservation strategy. The proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Project would be within the Solano County HCP subarea 2I which includes direction to mitigate for direct impacts to upland habitat at 3:1 (with creation of 0.01 acres of breeding habitat per acre of upland habitat impacted). Mitigation in the form of habitat preservation and enhancement and construction of new breeding habitat is required for all covered activities in the Solano County HCP within areas defined as potential California tiger salamander habitat. The mitigation ratio represents a regional strategy to preserve viable California tiger salamander populations in the area despite a continued overall net loss of California tiger salamander habitat in Solano County while increasing the reproductive output and carrying capacity of the remaining habitat. In addition, it meets the HCP's objectives to protect and maintain important landscape corridors; and maximize the value, productivity, and carrying capacity of those preserved lands.

Despite the lack of access to the surrounding habitat beyond the existing Caltrans ROW, the Service and the Caltrans' contract California tiger salamander biologist used aerial photography and field observations from available access locations to identify available upland habitat for refugia and dispersal as well as potential breeding locations throughout the action area vicinity. The Caltrans salamander biologist identified at least 16 potential breeding locations within 1.24 miles north and south of the action area (Caltrans 2008). Of these, three were characterized as providing potential high quality breeding habitat. All three sites are less than one mile from the action area with the closest within 0.34 miles. Given the habitat assessment, all of the action area is located between 500 feet and 1.3 miles of potential breeding habitat. The Service observed more potential breeding ponds within 1.3 miles of the action area on January 22, 2010. The Service also observed ponding in the State Route 12 box culvert immediately east of McClosky Road during a May 22, 2009 field visit. It is possible that ponding in this area provides breeding habitat in years when winter rainfall results in sufficient ponding at this location rather than flow. When the Service visited the action area on January 29, 2010 and February 5, 2010, we found ponding of greater than four feet at the culvert near McClosky Road. The culvert is recessed such that the inundation was not accompanied by the flow that might render it unavailable for successful breeding.

No protocol-level California tiger salamander surveys have been completed within or adjacent to the action area. None of the potential breeding ponds identified occur within areas where Caltrans could obtain permission for entry and surveys from the landowners. Incidental take for the California tiger salamander was also issued for the adjoining Caltrans State Route 12 project from Currie Road to 0.68 miles west of Walters Road near Suisun City (Caltrans EA OT0900 and OT1010). Formal consultation for this adjacent project was completed on November 27, 2006 (Service file 1-1-04-F-0122) and the project remained in active construction in February 2010.

Without a road mortality study or movement analysis it is difficult to determine where the "hot spots" for seasonal California tiger salamander movement across State Route 12, and hence

increased road mortality risk would occur. Given that the entire project is within 1.24 miles of potential breeding locations and the lack of impermeable barriers it is difficult to discount the potential crossing in any give portion of the project alignment. California tiger salamanders do not appear to favor particular routes of in-mass travel but it is more likely that higher concentrations of traveling adults or dispersing juveniles would be found closer to a breeding pond. Based on the limited information regarding the nearby habitat functions it may be more likely to encounter a higher concentration of California tiger salamanders attempting to cross State Route 12 at the western end of the project between Currie Road and McClosky Road. Including the box culvert at McClosky Road, there are three existing road undercrossings between McClosky and Currie Road.

Like most California highways, State Route 12 was a county road prior to becoming part of the State highway system. The project segment of State Route 12 was identified as Route 12 by 1919 (California Highways website 2009). The proposed project includes roadway improvements intended to modify this former county road to meet State Highway design and safety standards. Like most of the State's highways, the roadway now identified as State Route 12 was constructed long before the establishment of the National Environmental Policy Act (NEPA; 1969), the Act (1973), or the California Environmental Quality Act (CEQA; 1970); as well as the Federal listing of the Central Valley DPS of the California tiger salamander (2004) or our current understanding regarding the effects roads have on wildlife and how roads can be designed to minimize those effects.

It is likely that the California tiger salamander population along State Route 12 has been subject to a prolonged history of road mortality. There are no discernable barriers to prevent California tiger salamanders from entering the existing State Route 12 roadway within the proposed project area. According to the traffic data on Caltrans' website, the annual average daily traffic in the proposed project vicinity on State Route 12 (monitored at the State Route 113 junction) increased from 9,400 vehicles in 1992 to 15,000 in 2008 (<http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm>). This represents a 62.7 percent increase in daily traffic over a 16 year period. This steep and steady increase in vehicular use has likely exacerbated the risk of California tiger salamander-vehicle collisions.

The existing State Route 12 is likely a habitat fragmenting feature, not due to physical barriers but because of road mortality. Road mortality creates a semi-permeable barrier because some individual California tiger salamanders are likely to safely cross the roadway however; over time the increase in mortality risk to California tiger salamanders within 1.3 miles of State Route 12 can have a significant effect on population viability as the integrity of the larger population is disrupted (Rudolph et al. 1999; Forman 2000; Hilty and Merenlender 2004; Petit et al. 1995; and Buza et al. 2000).

Culverts are often used as a solution to provide "safe" passage of amphibians across roadways. All of the existing culverts crossing under State Route 12 in the action area are designed to convey hydrology. Based on the modifications proposed in the project description, it is likely

that most of these culverts are undersized for current hydrology. The above-ground activity of adult California tiger salamanders coincides with seasonal rain events. California tiger salamanders typically avoid flowing water and therefore would likely be excluded from using the existing cross culverts for passage if they are inundated with flowing water during this critical activity period. However, based on the Service's January and February 2010 visits to the action area, it does not appear that any of the 16 existing cross culverts in the action area experience significant water flow following substantial winter rain events. The local rolling topography appears to be more conducive of ponding typical of vernal pool grassland areas. The "blue line" drainage near the McClosky Road intersection is the largest linear aquatic feature crossing the action area and was better characterized as a corridor of linked ponded swales rather than a stream following prolonged January 2010 precipitation. Although the structures could be modified to enhance their use, all 16 existing cross culverts in the action area appeared to provide potential safe passage for the California tiger salamander in January and February 2010. State Route 12 includes an existing parallel Caltrans ROW fence on both sides of the roadway but the fence is not designed to exclude California tiger salamanders from the roadway or direct them towards the 16 "safe" crossings.

There are no street lights in the action area and limited ambient night lighting from low density housing and industrial operations.

The Service believes that the California tiger salamander is reasonably certain to occur within the action area because it is located within the species' range and current distribution and all the elements needed to support the species' life history are located within 0.5 miles of the action area as well as the biology and ecology of the animal, especially the ability of adults to move considerable distances between its breeding ponds and upland habitat. There are no constructed or natural features that would prevent California tiger salamanders from entering or inhabiting the Caltrans ROW. This listed species may use the existing cross culverts to inadvertently avoid the roadway but there are no barriers to direct them to these crossings. As mentioned on page 21, a California tiger salamander was recently discovered inhabiting a burrow in a constructed highway overpass. It is possible that this species could be breeding in the box culvert pond near McClosky Road in some years and/or be found taking refuge within the action area for the Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project and a greater likelihood that the species is making seasonal crossings of the roadway while traveling to or from any of the 16+ identified potential breeding ponds within 1.24 miles of the roadway.

Effects of the Proposed Action on the California Tiger Salamander

The efficacy of the proposed *Conservation Measures* depends on effective implementation. Effective implementation of *Conservation Measures* will likely minimize effects to the California tiger salamander but incidental take may still occur due to construction activities and habitat loss. Therefore, construction activities have the potential to result in a variety of adverse effects that would result in take of the California tiger salamander. Unless identified by the biological monitor or site personnel, and rescued by the biological monitor, individuals exposed

during excavations likely will be crushed and killed or injured by construction-related activities. Even with biological monitoring, overall awareness, and proper escape ramps, California tiger salamanders could fall into the trenches, pits, or other excavations, and then risk being directly killed or be unable to escape and be killed due to desiccation, entombment, or starvation. Proper trash disposal is often difficult to enforce on a large construction site and is a common non-compliance issue. Edible trash left during or after construction activities could attract predators, such as raccoons, crows, and ravens, to the sites, which could subsequently prey on the listed amphibian. Caltrans commitment to not using erosion control devices with mono-filament (Conservation Measure 19) should be effective in avoiding the associated risk of entrapment that can result in death by predation, starvation, or dessication (Stuart et al. 2001).

Caltrans often performs night work to avoid times of peak traffic, complete continuous activities, avoid extreme weather, and/or complete emergency work. Night work has a greater potential of adversely affecting nocturnal species such as the California tiger salamander. Wise and Buchanan (2006) reviewed the adverse effects that may result from night time illumination on salamander species. Artificial lighting used during night time construction may increase predation of California tiger salamanders, if it occurs during periods of fall, winter, or spring rains, because the amphibians will lose the cover of darkness for movement. Nocturnal foraging by salamander species may be affected by artificial lighting. In their study of the red-backed salamander (*Plethodon cinereus*), Wise and Buchanan (2006) observed that salamanders were less likely to emerge to forage within one to two hours following sunset in areas that were illuminated. During such foraging bouts, visual information was used for locating prey. Greater light levels delay emergence, resulting in less foraging time, but could have increased the ability of the salamanders to capture prey; however, they also could make the amphibians more vulnerable to predation. Many salamanders, such as the California tiger salamander, are terrestrial as adults but migrate to ponds to breed and lay eggs. The orientation of some of these terrestrial species away from and toward these ponds is influenced by the spectral characteristics of light (Wise and Buchanan 2006). Artificial lights that emit unusual spectra may disrupt these migration patterns.

In some years rainfall may result in ponding at the State Route 12 box culvert near McClosky Road rather than sufficient flow that would discourage California tiger salamander entry. A ponded situation would provide potential breeding habitat for the California tiger salamander. Extension of this box culvert is unlikely to result in modification of hydrologic conditions that would prevent the area from ponding in the future. Activities in the area could result in take of eggs, larvae, juvenile, and/or adult California tiger salamanders if any of these life stages is present while work is occurring at this location. According to *Conservation Measure 9*, Caltrans will only work on the box culvert between May 15 and October 15 to coincide with the driest period of the year. Additional biological monitoring will be needed if ponding persists during this work window.

The proposed project would result in the permanent loss of 13.62 acres of suitable upland habitat of the California tiger salamander. Habitat loss is one of the primary threats to this listed

amphibian. Locally, land conversion for row crop agriculture has been the primary reason for habitat loss. The California tiger salamander requires a large contiguous expanse of habitat to remain viable. It is reasonable to conclude that additional habitat loss would adversely affect the individuals that utilize the area for breeding, dispersal, and upland refugia. Additional habitat loss along an existing linear feature is likely to magnify the fragmentation created by the roadway as well as surface area in which a California tiger salamander is likely to be subjected to a vehicle collision.

The effect of habitat fragmentation on the California tiger salamander is potentially significant when there are insufficient features to facilitate safe and sufficient passage. Fragmentation can reduce access to habitat as well as habitat suitability, and disrupt movements, dispersal, and gene flow. The construction and widening of roads through California tiger salamander habitat may restrict or block movement between breeding ponds and upland habitat. The likelihood of this effect will increase with larger road size, higher traffic volume, and the presence of fences or median barriers in the absence of effective safe crossing features. In addition to limiting access to breeding ponds or upland habitat, roads also may reduce the suitability of habitat for the California tiger salamander by fragmentation into patches too small for effective use by the species. As a habitat patch decreases in size, the number of animals the patch can support also decreases. This increases the probability that the animals will be extirpated from each habitat patch. The possibility for recolonization will depend upon the nature of the factors, e.g., roads, canals, development, etc., that are causing the fragmentation.

Roads have been documented as barriers to movements by a diversity of species, and this effect varies with road size and traffic volume. The inhibition of animal movements caused by roads produces a significant effect by fragmenting habitats and populations (Joly and Morand 1997). Roads were found to be significant barriers to gene flow among common frogs (*Rana temporaria*) in Germany and this has resulted in genetic differentiation among populations separated by roads (Reh and Seitz 1990). Similarly, significant genetic subdivision was detected in bank voles (*Clethrionomys glareolus*) populations separated by a 164 foot wide highway in Germany (Gerlach and Musolf 2000).

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California tiger salamander are especially vulnerable to roads in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. California tiger salamanders make seasonal movements as much as 1.3 miles and as described by Carr and Fahrig (2001), such vagile amphibians are more likely to encounter roads, increasing their risk of mortality.

The increased width of the State Route 12, decreased congestion, higher levels of vehicle traffic, and increased speed will result in higher numbers of California tiger salamanders killed during their movements between their upland habitat and breeding ponds due to increased surface area

for vehicle collisions to occur. Fahrig et al. (1995) found that high traffic two-lane paved roads had a much larger effect on amphibian abundance than low traffic two-lane roads. Mortality rates for anurans on high traffic roads are higher than on low traffic roads (Hels and Buchwald 2001). Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (e.g., Ashley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are slow-moving and small, and thus can not easily be avoided by drivers (Carr and Fahrig 2001). Most road mortality studies regularly document records from a slow moving vehicle (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick et al. 1998) or by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but it certainly is not true for small animals, such as the California tiger salamander. Discovery of a California tiger salamander road mortality carcass is likely limited to a brief time following the incident due to their small size, soft bodies, rapid desiccation and decomposition, and the likelihood that the carcass will be repeatedly crushed by a succession of vehicles and or removed by a scavenger.

California tiger salamander mortality and injury occurs when the animals attempt to cross roads and are hit by cars, trucks, or motorcycles. The majority of strikes occur on rainy nights when the animals are moving to their breeding ponds. Thus, vehicle strikes are a direct source of mortality for the California tiger salamander. If vehicle strikes are sufficiently frequent in a given locality, this could result in reduced abundance of this animal. Especially problematic is the death of females prior to the laying of their eggs because this could result in the loss of an entire cohort, and therefore, reduced recruitment of new individuals into the population.

Vehicles constitute a consistent source of mortality for the animal, based on the frequency with which vehicle strikes occur. Although no systematic, range-wide studies have been conducted, it is known that significant numbers of California tiger salamanders are killed by vehicular traffic while crossing roads (Hansen and Tremper 1993; S. Sweet, in litt. 1993; Joe Medeiros, Sierra College, pers. comm. 1993). For example, during a one-hour period on a road bordering Lake Lagunita on the Stanford University campus, 45 California tiger salamanders were collected, 28 of which had been killed by cars (Twitty 1941). More recently, during one 15-day period in 2001 at a Sonoma County location, 26 road-kill California tiger salamanders were found (D. Cook, pers. comm. 2002). Overall breeding population losses of California tiger salamanders due to road mortality have been estimated to be between 25 and 72 percent (Twitty 1941; S. Sweet in litt. 1993; Launer and Fee 1996). Mortality may be increased by associated roadway curbs and berms as low as 3.5 to five inches, which allow California tiger salamanders access to roadways but prevent their exit from them (Launer and Fee 1996; S. Sweet in litt. 1998).

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry

predict that individual animals will exit patches at more “permeable” areas (Buechner 1987; Stamps et al. 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a “corridor” must be determined from the perspective of the animal (Forys and Humphrey 1996).

The proposed project includes upsizing of four existing culverts that provide a perpendicular crossing under State Route 12. Although the culverts are solely designed to route existing hydrology under the roadway they also represent existing potential for California tiger salamander safe passage across the roadway. The planned replacement of one (1) 18-inch diameter culvert with a 24-inch culvert and two (2) 12-inch culverts and one (1) 15-inch culvert with 18-inch culverts has the potential to enhance the wildlife passage in the action area due to the larger size and natural bottom design.

The four replaced culverts and the other 12 existing cross culverts are unlikely to have sufficient water flow to deter California tiger salamanders from using them during the night-time rain events when the animal is most likely to be above ground and moving. These crossings appear to be ponded or moist during these critical wet periods. This condition should limit the risk of desiccation and death that can occur when amphibians enter dry culvert crossings. Although likely adequate, the crossing design could be enhanced by using the FHWA’s *Wildlife Vehicle Collision Reduction Study* guidance on various crossing designs that promote air, soil humidity, and light conditions that are remain similar to those conditions found outside the tunnels (FHWA 2008).

Potential passage would be further enhanced if Caltrans were to incorporate design features that directed animals to culvert crossings. Exclusionary and directional curbs and/or fencing are integral to the success of wildlife crossings (McAllister 2009, Gagnon 2009, Pagnucco 2009, Dodd 2009, WTI 2006) and have been shown to be very successful relative to cost (Craighead 2009). Surveys of fenced and unfenced roads suggest that fencing greatly reduces road mortality of many vertebrate species (Boarman 1995). Preliminary results from a National Park Service and Caltrans study on State Route 23 indicate that enhancing existing culverts and installing directional fencing reduced road mortality and was likely responsible for a five fold increase in use of the passage (Sikich et al. 2009). The risk of becoming road kill outweighs possible predation risk of “funneling” salamanders to undercrossings (Little et al. 2002) and the presence of road mortality may increase the concentration of California tiger salamander predators near roadways. Caltrans is listed as a “cooperator” on the *Safe Passage* document developed by the Southern Rockies Ecosystem Project, Wildlife Consulting Resources, and the Center for Transportation and the Environment (<http://www.carnivoresafepassage.org/index.htm>). Caltrans staff is listed as a reviewer of the document. As stated on the document’s website:

“Fencing is as critical as the wildlife crossing structures and approaches. Most wildlife are extremely wary and will avoid confinement or unnatural situations. Given the choice between going through unfamiliar wildlife crossing structures and crossing highway

pavement, many will choose the latter. Fencing forces wildlife to use the crossings. Over time, research indicates wildlife species will be more comfortable using wildlife crossings. Adaptations to using wildlife crossings may take up to five years... Without fencing, most of these animals would not use the structures.”

Successful amphibian-specific road crossings and other wildlife crossing that could be used by amphibians have been designed and installed by local transportation agencies, other state transportation departments, and in Canada and Europe. Slow moving and inconspicuous species such as the California tiger salamander whose life history depends on successful seasonal movements are especially prone to the fragmentation, barriers, and other road effects presented by linear features such as State Route 12. Transportation enhancement or safety projects such as the proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project present a cost-effective opportunity to address existing and future road effects on the California tiger salamander.

It is unclear how readily California tiger salamanders will use long concrete or corrugated metal culverts across a roadway that are not day-lighted, is only designed to contain the width of the drainage, and do not have regular maintenance to prevent filling with sediment and debris. The dimension of the tunnels is considered one of the most important variables in the design of passage ways for vertebrates (Yanes et al. 1995; Rodriguez et al. 1996); although no studies have determined a minimum width for the California tiger salamanders, passages made for other salamander species, must be wide and tall enough to enable animals to clearly see to the opposite end of the culvert, or there is lighting along the culvert provided by overhead grates. Ng et al. (2004) note that culverts typically are installed to accommodate water flow and the installation of such passage ways solely for listed species and wildlife, especially across major roadways, is justified if no other passages or crossings exist and there is suitable habitat. It is also important that the crossing attract targeted listed species and wildlife; fencing or other measures be incorporated into a wildlife crossing to guide animals to the preferred crossing; the crossing be placed strategically to enhance habitat connectivity; and that the adjacent land use be conducive to long-term habitat protection (Portland State University 2003). The long term viability of any designated wildlife crossing is questionable unless crossing locations and the habitat on both sides of the crossing are permanently set aside as open space or have a conservation easement or some other designation that limits development. With Caltrans' proposed culvert modifications and project design, no intent has been stated or demonstrated to (a) ensure California tiger salamanders are directed to crossings, (b) demonstrate that the existing culverts are properly placed relative to the California tiger salamanders' use of the surrounding landscape to provide a logical crossing location, and (c) maintain them in way that ensures that sediment and debris buildup over time does not preclude their use by crossing California tiger salamanders. The lack of fencing (such as ERTECH's high UV E-Fence, <http://www.ertecsystems.com/>) or California tiger salamander-impassible curbs to direct California tiger salamanders to the culverts will result in individuals crossing the roadway where they are more likely to be killed by vehicles.

Road studies suggest that properly designed passage can significantly reduce wildlife mortality, including amphibian mortality (Dodd et al. 2004). The Town of Amherst in the State of Massachusetts installed two culverts with directional fences to facilitate spotted salamander (*Ambystoma maculatum*) migration from their wintering burrows during the spring. Before the placement of these culverts under Henry Street, a two-lane street, salamander mortality was high. After installation, approximately 75.9 percent of animals that reached the tunnel entrances successfully passed through them (Jackson 1996).

Because their habitats have been fragmented, many endangered and threatened species exist as metapopulations (Verboom and Apeldoorn 1990; Verboom et al. 1991). A metapopulation is a collection of spatially discrete subpopulations that are connected by the dispersal movements of the individuals (Levins 1970; Hanski 1991). For metapopulations of listed species, a prerequisite to recovery is determining if unoccupied habitat patches are vacant due to the attributes of the habitat patch (food, cover, and patch area) or due to patch context (distance of the patch to other patches and distance of the patch to other features). Subpopulations on patches with higher quality food and cover are more likely to persist because they can support more individuals. Large populations have less of a chance of extinction due to stochastic events (Gilpin and Soule 1986). Similarly, small patches will support fewer individuals, increasing the rate of extinction. Patches that are near occupied patches are more likely to be recolonized when local extinction occurs and may benefit from emigration of individuals via the “rescue” effect (Hanski 1982; Gotelli 1991; Holt 1993; Fahrig and Merriam 1985). For the metapopulation to persist, the rate of patches being colonized must exceed the rate of patches going extinct (Levins 1970). If some subpopulations go extinct regardless of patch context, recovery actions should be placed on patch attributes. Patches could be managed to increase the availability of food and/or cover. As discussed in the Status section of this biological opinion, the natural history of the California tiger salamander relies on the movement between upland and aquatic habitats and corridors for that movement likely are critical to population dynamics, particularly because the animals likely currently persist as metapopulations with disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects. The survival of wildlife species in fragmented habitats may ultimately depend on their ability to move among patches to access necessary resources, retain genetic diversity, and maintain reproductive capacity within populations (Hilty and Merenlender 2004; Petit et al. 1995; Buza et al. 2000).

Most metapopulation or meta-population-like models of patchy populations do not directly include the effects of dispersal mortality on population dynamics (Hanski 1994; With and Crist 1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile³ species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict exactly the opposite:

³ Vagile, meaning having the ability to freely move about and disperse in a given environment.

more vagile species should be more vulnerable to habitat loss and fragmentation because they are more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He found that species with low dispersal rates are better able than more vagile species to persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitats serves as a demographic “drain” for many amphibians. Furthermore, Bonnet et al. (1999) found that snake species that use frequent long-distance movements have higher mortality rates than do sedentary species.

Negative effects to wildlife populations, including the California tiger salamander from roads and urban development may extend some distance from the actual project footprint. The phenomenon can result from any of the effects already described in this biological opinion (e.g. direct mortality, vehicle-related mortality, habitat degradation, invasive exotic species, etc.). Forman and Deblinger (1998) described the area affected as the “road effect” zone. Along a four-lane road in Massachusetts, they determined that this zone extended for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. However, in some locations they detected an effect >0.6 mile from the road. Rudolph et al. (1999) detected reduced snake abundance up to 2,790 feet from roads in Texas. They estimated snake abundance out to 2,790 feet, so the effect may have been greater. Extrapolating to a landscape scale, they concluded the effect of roads on snake populations in Texas likely was significant, given that approximately 79 percent of the land area in Texas is within 1,640 feet of a road. The “road-zone” effects can be subtle. Van der Zandt et al. (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding 1,575-6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep (*Ovis canadensis*) increases near roads (MacArthur et al. 1979). Trombulak and Frossell (2000) described another type of “road-zone” effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, but elevated levels of metals in both soil and plants were detected at 660 feet of roads. The “road-zone” apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The “road zone” for the California tiger salamander has not been adequately investigated; however, it is possible it exists given the documented effects of roads and development on these animals. Given the differing proximity of at least 16 potential breeding ponds within 1.24 miles of the proposed project, the road effect zone to California tiger salamanders in the area may vary along the road alignment but have the potential to extend as much as 1.3 miles or more from the roadway given their ability to move such distances.

The proposed conservation measures are likely to minimize the take of California tiger salamanders that could result from the potential adverse effects associated with the proposed construction activities. Biological monitoring, worker education, the implementation of proper erosion control BMPs, contaminate control, pre-construction surveys, and proper limited

localized relocation of California tiger salamanders in immediate harm should reduce the death and injury to individual California tiger salamanders. Post-construction restoration of temporary work areas will likely limit the invasion of non-native vegetation. As proposed, the project does not address or alleviate the adverse effects described in the baseline for the existing roadway or minimize the collective adverse effects resulting from the proposed roadway widening.

Cumulative Effects within the Action Area

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Numerous non-Federal activities continue to negatively affect the California tiger salamander in Solano County. The Solano County Water Agency, in cooperation with the cities of Fairfield, Suisun, Rio Vista and several other applicants are currently preparing a regional habitat conservation plan (HCP) pursuant to section 10(a)(1)(B) of the Act that is expected to address the effects of land uses and associated conservation activities in this area on listed species (SWCA 2009). The draft HCP includes the action area and the California tiger salamander. This HCP anticipates that actual development will be substantially reduced from the potential 1,000 acres of zoned development land in Fairfield and Suisun (SWCA 2009). Implementation of the HCP will also result in the designation, acquisition, and management of conservation areas within Solano County for the California tiger salamander. Other threats include contamination, poisoning, increased predation, and competition from non-native species associated with human development. Small private actions that may adversely affect listed species, such as conversion of land, small mammal population control, disking, mosquito control, and residential development, may occur without consultation with or authorization by the Service or the California Department of Fish and Game pursuant to their respective Endangered Species Act.

The cumulative local development will result in temporary and permanent habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

Cattle-grazing is a common land use practice in rural Solano County and is occurring along the north and south boundaries of the project footprint. Overgrazing results in degradation and loss of riparian vegetation, increased water temperatures, stream bank and upland erosion, and decreased water quality in streams. Livestock operations may also degrade water quality with pesticides and nutrient contamination. However, light to moderate livestock grazing is generally thought to be compatible with continued successful use of rangelands by the California tiger salamander and other listed species, provided the grazed areas do not also have intensive

burrowing rodent control efforts (T. Jones, in litt. 1993; Shaffer et al. 1993). The shorter vegetation associated with grazed areas may make the habitat more suitable for ground squirrels whose burrows are utilized by California tiger salamanders. Rodent control in rural areas in Solano County could contribute to the decline of this listed amphibian in the region, as well as other sensitive species that utilize burrows created by burrowing rodents.

Agricultural development, impoundments, and irrigation can reduce stream flows, resulting in the loss of aquatic habitat during the summer for California tiger salamanders. Discing is a common practice on agricultural lands which can result in substantial losses of upland habitat for California tiger salamanders. Significant conversion of rural, undeveloped land to agricultural land, particularly vineyards, is currently occurring in Solano County, resulting in loss of upland habitat for listed species.

As urban development continues, it will likely adversely affect upland areas that serve as dispersal and refuge habitat for California tiger salamanders. Continued development and maintenance of roadways to serve expanding urban areas may further fragment and isolate populations of California tiger salamanders from other nearby populations and increased road mortality due to the construction and use of new roads and increased traffic in the overall region. Increased predation associated with domesticated pets or feral animals generally accompanies urban expansion. As urban development encroaches on rural areas, the need increases for mosquito abatement programs that introduce exotic fish into breeding and non-breeding ponds impact the reproductive success of California tiger salamanders.

California tiger salamanders likely are exposed to a variety of pesticides and other chemicals throughout their ranges. This amphibian species could also die from starvation due to the loss of their prey base. Hydrocarbon and other contamination from oil production and road runoff; the application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have negative effects on California tiger salamanders.

Further habitat fragmentation; additional non-native species introduction; translocation of infected individuals, and increased access to aquatic habitat could facilitate or increase the spread of amphibian diseases within the range of the California tiger salamander. The global mass extinction of amphibians primarily due to chytrid fungus continues to be of significant concern (Norris 2007; Skerratt et al 2007).

The global average temperature has risen by approximately 0.6 degrees centigrade during the 20th Century (IPCC 2001, 2007; Adger et al 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007; Adger et al. 2007), and that it is "very likely" that it is largely due to increasing concentrations of greenhouse gases (carbon dioxide, methane, nitrous oxide, and others) in the global atmosphere from burning fossil fuels and other human activities (Cayan et al. 2006, EPA Global Warming webpage <http://yosemite.epa.gov>; Adger et al. 2007). Eleven of the twelve years between 1995

and 2006 rank among the twelve warmest years since global temperatures began in 1850 (Adger et al. 2007). The warming trend over the last fifty years is nearly twice that for the last 100 years (Adger et al. 2007). Looking forward, under a high emissions scenario, the International Panel on Climate Change estimates that global temperatures will rise another four degrees centigrade by the end of this Century; even under a low emissions growth scenario, the International Panel on Climate Change estimates that the global temperature will go up another 1.8 degrees centigrade (International Panel on Climate Change 2001).

The increase in global average temperatures affects certain areas more than others. The western United States, in general, is experiencing more warming than the rest of the Nation, with the 11 western states averaging 1.7 degrees Fahrenheit warmer temperatures than this region's average over the 20th Century (Saunders et al. 2008). California, in particular, will suffer significant consequences as a result of global warming (California Climate Action Team 2006). In California, reduced snowpack will cause more winter flooding and summer drought, as well as higher temperatures in lakes and coastal areas. The incidence of wildfires in California also will increase and the amount of increase is highly dependent upon the extent of global warming. No less certain than the fact of global warming itself is the fact that global warming, unchecked, will harm biodiversity generally and cause the extinction of large numbers of species. If the global mean temperatures exceed a warming of two to three degrees centigrade above pre-industrial levels, twenty to thirty percent of plant and animal species will face an increasingly high risk of extinction (International Panel on Climate Change 2001, 2007).

The mechanisms by which global warming may push already imperiled species closer or over the edge of extinction are multiple. Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (International Panel on Climate Change 2001, 2007; California Climate Action Team 2006; Lenihan et al. 2003). Extreme events, in turn may cause mass mortality of individuals and significantly contribute to determining which species will remain or occur in natural habitats. As the global climate warms, terrestrial habitats are moving northward and upward, but in the future, range contractions are more likely than simple northward or upslope shifts. Ongoing global climate change (Anonymous 2007; Inkley et al. 2004; Adger et al. 2007; Kanter 2007) likely imperils the California tiger salamander and the resources necessary for its survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California tiger salamander, the environmental baseline for the action area; the effects of the proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is likely to result in take of California tiger salamander but is not likely to jeopardize the continued existence of this listed species.

The existing roadway bisects upland habitat for the species and potential breeding ponds are located within the action area and on either side of the roadway within the know travel distance of the California tiger salamander. The primary threat of the project is that it will likely increase the risk of road mortality by increasing the road surface area and increasing vehicle speeds by decreasing congestion. Although the existing road way and the proposed modifications are likely to continue to reduce the population within in at least 1.3 miles of the action area, the adverse effect to the larger population within Solano County is unlikely to significantly affect the recovery of the species. Given appropriate habitat compensation and the incorporation of appropriate design measures to deter California tiger salamanders from entering the roadway and directing them to safe crossings likely would alleviate the local risk to the species while maintaining some genetic connectivity and possibly result in a species recovery benefit.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

This biological opinion does not authorize take for the non-Federal actions associated with use, operation, and maintenance of State Route 12 and the associated Caltrans ROW. Routine Caltrans' maintenance activities such as the removal/displacement of sand, silt, sediment, debris, rubbish, vegetation, and other obstruction flow; the control of weeds, grasses and emergent vegetation, minor repair of existing facilities, rip rap replacement, and culvert replacement have the potential to result in take of the California tiger salamander.

The measures described below are non-discretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to Caltrans as appropriate, in order for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this Incidental Take Statement. If Caltrans (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect because when California tiger salamanders are not in their breeding ponds, they inhabit underground refugia; they may be difficult to locate due to their cryptic appearance and behavior; the juvenile and adult animals may be located a long distance from the breeding ponds; above ground movement occurs during a limited activity period typically coinciding with rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual, even as road kill, is unlikely because of their relatively small body size and rapid carcass deterioration. Recent project monitoring suggests that California tiger salamanders are difficult to find during preconstruction clearance surveys that include excavation of potential upland California tiger salamander refugia in close proximity to breeding ponds and other aquatic habitat. Due to the difficulty in quantifying the number of California tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as the mortality or injury of two (2), and the harm, harassment, and capture of all of the California tiger salamanders inhabiting or utilizing the 13.62 acres of habitat that encompasses the entire action area during project construction. The incidental take is expected to be in the form of harm, harassment, capture, injury, and mortality to adult California tiger salamanders from habitat loss/degradation, construction-related disturbance, and capture and relocation. Incidental take is not issued for activities associated with future roadway, culvert, ROW fence, vegetation, or other maintenance or modification activities within the Caltrans ROW. Furthermore, incidental take is not issued for California tiger salamander-vehicle collisions following project completion.

Upon implementation of the following reasonable and prudent measures incidental take associated with the proposed action described above for the California tiger salamander will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take for the California tiger salamander is not likely to jeopardize the continued existence of this species.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the California tiger salamander. Caltrans will be responsible for the implementation and compliance with these measures:

1. Caltrans will implement the conservation measures in the project description as described in the revised project description provided on May 29, 2009, and this biological opinion.

2. Caltrans will implement additional actions to minimize adverse effects to the California tiger salamander.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure one (1):
 - a. Caltrans shall minimize the potential for harm, harassment, or killing of federally listed wildlife species resulting from project related activities by implementation of the conservation measures as described in March 2009 revised Caltrans response and appearing in the *Project Description* of this biological opinion.
 - b. This biological opinion was based on project design plans that were 35 percent complete. Caltrans shall provide the completed design and project description for review a minimum of ninety (90) calendar days prior to construction. Caltrans shall reinstate consultation if the final plans result in a larger action area and/or effects to listed species not adequately considered in this biological opinion.
 - c. Caltrans shall include Special Provisions that include the *Conservation Measures* and the *Terms and Conditions* of this biological opinion in the solicitation for bid information. In addition, Caltrans shall educate and inform contractors involved in the project as to the requirements of the biological opinion.
 - d. Caltrans will not be required to obtain California Department of Fish and Game approval for the conservation actions described in this biological opinion if a State Endangered Species Take Permit for California tiger salamander is not required by California Department of Fish and Game at the time actions associated with the project may result in take of the California tiger salamander
 - e. The applicants shall include a copy of this biological opinion within its solicitations for design and construction of the proposed project making the primary contractor responsible for implementing all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. A copy of the solicitations containing the biological opinion also shall be provided to Coast-Bay Branch Chief at the Sacramento Fish and Wildlife Office.

2. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):
 - a. At least 30 calendar days prior to initiating construction activities, the project proponents shall submit the names and qualifications of the biological monitor(s) for the proposed project for Service approval.
 - b. The Resident Engineer or their designee shall be responsible for implementing the conservation measures and *Terms and Conditions* of this biological opinion and shall be the point of contact for the project. The Resident Engineer or their designee shall maintain a copy of this biological opinion onsite whenever construction is taking place. Their name and telephone number shall be provided to the Service at least thirty (30) calendar days prior to groundbreaking at the project. Prior to groundbreaking, the Resident Engineer must submit a letter to the Service verifying that they possess a copy of this biological opinion and have read the *Terms and Conditions*.
 - c. The Worker Environmental Awareness Training Program described in *Conservation Measure 4* shall be provided for all construction personnel prior to their involvement in work activities. The program shall focus on the conservation measures that are relevant to employee's personal responsibility. Distributed materials should include wallet-sized cards with a distinctive photograph of the California tiger salamander, compliance reminders, and relevant contact information. Documentation of the training, including attendee sign-in sheets, shall be submitted to the Service with the annual compliance report described in the *Reporting Requirements* of this biological opinion. An outline of the program shall be submitted to Chris Nagano, Division Chief, Endangered Species Program within twenty (20) working days prior to the initial onset of construction activities. As needed, training shall be conducted in Spanish for Spanish language speakers. Documentation of the training, including individual signed affidavits, shall be kept on file and available on request.
 - d. Only Service-approved biological monitors shall implement the monitoring duties outlined in this biological opinion including delivery of the Worker Environmental Awareness Training Program.
 - e. The Service-approved biologist(s) shall be given the authority to communicate – verbally or by telephone, email message or hardcopy with Caltrans personnel, construction personnel or any other person(s) at the project site or otherwise associated with the project. The Service-approved biologist(s) shall have oversight over implementation of all the *Terms and Conditions* in this biological opinion, and shall have the direct authority to stop project activities if any of the requirements associated with these *Terms and Conditions* are not being fulfilled. If the Service-approved biologist(s) exercises this authority, the Service shall be notified by telephone and electronic mail within 24 hours. The Service contact is Chris Nagano,

Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600.

- f. A Service-approved biologist(s) shall be onsite during any ground disturbing activities. Prior to approval, the biologist(s) must submit a letter to the Service verifying that they possess a copy of this biological opinion and understand its *Terms and Conditions*. The biologist(s) shall keep a copy of this biological opinion in their possession when onsite. The biologist(s) shall have the authority to stop any work, through communication with the Resident Engineer or their designee that may result in the take of a listed species. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game shall be notified by telephone and email message within one (1) working day. The Service contact is Chris Nagano, Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600 or by an email message at Chris_Nagano@fws.gov.
- g. The onsite biological monitor shall check for animals under any equipment such as vehicles and stored pipes before the start of work each morning. The biological monitor shall check all excavated steep-walled holes or trenches greater than one foot deep for California tiger salamander.
- h. A Service-approved biological monitor will inspect the project site within one week prior to a forecasted rain event to ensure that the adequate stormwater BMPs are properly installed. The biological monitor will also inspect the site during and/or within two (2) calendar days following the onset of the rain event to ensure that the stormwater BMPs are adequate in minimizing harm to California tiger salamanders and their habitat.
- i. A Service-approved biological monitor will be onsite if ponding persists at the box culvert near McClosky Road or any where else in the action area at any time of the year. In such case the monitor will thoroughly inspect the ponded area for the California tiger salamander. If a California tiger salamander is found, the monitor will contact the Service and the California Department of Fish and Game prior to further activities within 250 feet of the aquatic feature.
- j. In brief, each California tiger salamander encounter shall be treated on a case-by-case basis in coordination with the Service but general guidance is as follows: (1) Leave the non-injured animal if it is not in danger; (2) move the animal to a nearby location if it is in danger; or (3) the animal may be taken into custody for educational outreach and/or scientific research if the first two options are unavailable.

These three options are further described below.

1. When a California tiger salamander is encountered in the action area the first priority is to stop all activities in the surrounding area that have the potential to result in the harm, harassment, injury, or death of the individual. Then the monitor needs to assess the situation in order to select a course of action that will minimize the effects to the individual.

Contact the Service once the site is secure. The primary contact for this situation is Chris Nagano (chris_nagano@fws.gov). If Chris Nagano is not available, then the biologist you should contact is Ryan Olah (ryan_olah@fws.gov) or John Cleckler (john_cleckler@fws.gov). All can be reached at (916) 414-6600. If you get voicemail message for all three contacts then contact John Cleckler on his cell phone at (916) 712-6784. The issue of contacting people on the weekend or after office hours is addressed later.

The first priority is to avoid contact with the salamander and allow it to move out of the action area and danger on its own to a safe location. The animal should not be picked up and moved because it is not moving fast enough or it is inconvenient for the construction activities. This guidance only applies to situations where a California tiger salamander is encountered on the move during conditions that make their upland travel feasible (which is usually during the wet season and outside the typical work window). This does not apply to California tiger salamanders that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the life history of the California tiger salamander should they move outside the construction footprint.

Avoidance is the preferred option if the California tiger salamander is not moving and is using aquatic habitat or is within some sort of burrow or other refugia. The area should be well marked for avoidance and a Service-approved biological monitor should be assigned to the area when work is taking place nearby.

The above options are not always feasible and sometimes capture and moving the animal is the only option to prevent its death or injury.

2. If appropriate habitat is located immediately adjacent to the capture location then the preferred option is short distance relocation to that habitat. This must be coordinated with the Service but the general guidance is that the animal should not be moved outside of the area it would have traveled on its own. Under no circumstances should an animal

be relocated to another property without the owner's written permission. It is Caltrans' responsibility to arrange for that permission.

The release must be coordinated with the Service and will depend on where the individual was found and the opportunities for nearby release. In most situations the release location is likely to be into the mouth of a small burrow or other suitable refugia and in certain circumstances pools without non-native predators may be suitable.

Several amphibian diseases may be involved in amphibian declines and may be spread by relocating animals. Therefore, due to concerns regarding genetic and health issues and adverse effects to other California tiger salamanders, the Service does not approve of long distance relocation of California tiger salamanders on this project (i.e., out of the watershed or greater than 300 feet).

Only Service-approved biologists for the project can capture California tiger salamanders. Nets or bare hands may be used to capture California tiger salamanders. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within two hours before and during periods when they are capturing and relocating California tiger salamanders. To avoid transferring disease or pathogens between sites during the course of surveys or handling of the animals, Service-approved biologists must use the following guidance for disinfecting equipment and clothing. These recommendations are adapted from the *Declining Amphibian Population Task Force's Code* which can be found in their entirety at: <http://www.open.ac.uk/daptf/>

- a) All dirt and debris, including mud, snails, plant material (including fruits and seeds), and algae, must be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water and/or a salamander. Cleaned items should be rinsed with clean water before leaving each site.
- b) Boots, nets, traps, etc., must then be scrubbed with either a 70 % ethanol solution, a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water), QUAT 128 (quaternary ammonium, use 1:60 dilution), or a 6% sodium hypochlorite 3 solution and rinsed clean with water between sites. Avoid cleaning equipment in the immediate vicinity of a pond or wetland. All traces of the disinfectant must be removed before entering the next aquatic habitat.

- c) Disposable gloves must be worn and changed after handling each animal.
- d) Used cleaning materials (liquids, etc.) must be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves must be retained for safe disposal in sealed bags.

Service-approved biologists must limit the duration of handling and captivity. While in captivity, individual California tiger salamanders shall be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting should not contain any standing water.

- 3. Based on the above guidance, if California tiger salamanders cannot be moved, the individuals should be used for outreach and/or research. We have developed a short list of likely recipients of California tiger salamanders. Delivery of individuals to the recipient shall be coordinated with the Service. Unless otherwise directed, California tiger salamanders shall be delivered to the Brad Shaffer Lab at the University of California at Davis. Mr. Shaffer and the lab staff may be reached at (530) 752-2939 and hbshaffer@ucdavis.edu.
- k. To prevent inadvertent entrapment of California tiger salamander during construction, steep-walled holes or trenches more than two feet deep shall 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, may be used to further prevent the inadvertent entrapment of California tiger salamander. 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 must be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service shall be contacted by telephone for guidance. The Service shall be notified of the incident by telephone and electronic mail within one working day.
- l. Materials left onsite overnight shall be inspected, because California tiger salamanders are attracted to cavity-like structures such as pipes and may seek refuge under construction equipment or debris, these species may become trapped or injured if such materials are moved. All construction pipes, culverts, or similar structures, construction equipment or construction debris left overnight within the action area shall be inspected prior to the beginning of each day's activities.

- m. The biological monitor shall be required to report any take to the Service immediately by telephone at (916) 414-6600 and by email message or written letter addressed to Chris Nagano, Division Chief, Endangered Species Program, within one (1) working day of the incident.
- n. The effects to the California tiger salamander from the permanent loss of 13.62 acres of habitat shall be compensated at an additional 2:1 to the 1:1 proposed by Caltrans in *Conservation Measure 1* for a total of 3:1 (40.86 acres) within occupied California tiger salamander habitat. Caltrans shall provide a Funding Assurance Letter stating that sufficient funds for habitat compensation have been budgeted in the Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project Expenditure Authorization. The Funding Assurance Letter shall be signed by the District Deputy Director of Project Management and the District Deputy Director of Environmental Planning and Engineering and approved to the Service and California Department of Fish and Game's Offices of the General Counsel. The Funding Assurance Letter provides evidence that Caltrans has allocated sufficient funding to implement the proposed compensation, monitoring and reporting requirements including habitat conservation credits or land acquisition costs, costs of managing the mitigation lands, and an endowment. Caltrans shall compensate for these effects through one of the options described below:
 - 1) Caltrans shall purchase 40.86 conservation bank credits at a Service and California Department of Fish and Game -approved conservation bank whose service area encompasses the action area for the California tiger salamander. Conservation credits shall be purchased and documentation provided to the Service and the California Department of Fish and Game comprising the Agreement for Sale of Conservation Credits, Bill of Sale, Payment Receipt and Updated Credit Ledger within one-year following the start of construction.
 - 2) Caltrans shall contribute toward the acquisition of habitat for the California tiger salamander approved by the Service and California Department of Fish and Game. The habitat shall be located within Solano County and shall have a conservation easement or other appropriate entitlement, management plan, and endowment to manage the habitat in perpetuity; all of which shall be reviewed and approved by the Service and California Department of Fish and Game, and completed within sixty (60) calendar days prior to the date of initial ground-breaking. Acquisition of land shall be in fee by an agreed upon third party land owner/manager. Acquisition of land shall either be through conservation easement or fee title. The conservation easement shall name the Service and California Department of Fish and Game as third-party beneficiaries and shall be held by an entity qualified to hold conservation easements subject to approval by the Service and California Department of Fish and Game. An endowment to manage the land and monitor the

conservation easement shall be secured using an escrow account or other funding assurance acceptable to and approved by the Service and California Department of Fish and Game. The endowment shall be held by a Service and California Department of Fish and Game -approved entity in an amount agreed to by the Service and the California Department of Fish and Game. A management plan shall be developed prior to or concurrent to the acquisition of land and shall include, but not limited to; a description of existing habitats and planned habitat creation, restoration and/or enhancement; monitoring criteria for the California tiger salamander; an integrated pest management and monitoring plan to control invasive species; habitat creation, restoration and/or enhancement success criteria; and adaptive management strategies if success criteria are not met or to incorporate new scientific data.

- o. The culverts being replaced shall be designed and installed to allow passage for the California tiger salamander in order to minimize the risk of take due to road mortality following construction. Existing culverts that will remain in place but will be extended should be modified when possible to increase their probable and effective use by the California tiger salamander. Caltrans shall provide the Service with a report on how this measure will be implemented prior to construction and within thirty (30) calendar days following the issuance of the final drainage system design.
- p. Fencing shall be attached to the Caltrans ROW fence in such a way to prevent California tiger salamanders from gaining access to the roadway and direct them towards the culvert crossings. The exclusionary and directional fencing shall extend a minimum of the length of the project and should terminate in such a way that California tiger salamanders are unlikely to gain ingress to the roadway. Installation of this fencing should also be effective in excluding California tiger salamanders from the fenced Caltrans ROW, therefore minimizing or removing the risk of take associated with non-Federal actions such as maintenance activities or for future Federal activities that would occur within the fenced ROW.

Reporting Requirements

Observations of California tiger salamanders or of any listed or sensitive animal species shall be reported to the California Natural Diversity Data Base (CNDDDB).

Injured California tiger salamanders shall be cared for by a licensed veterinarian or other qualified person such as the on-site biologist; dead individuals must be placed in a sealed plastic bag with the date, time, location of discovery, and the name of the person who found the animal; the carcass should be kept in a freezer; and held in a secure location. The Service and the California Department of Fish and Game shall be notified within one (1) working day of the discovery of death or injury to a California tiger salamander that occurs due to project related activities or is observed at the project site. Notification shall include the date, time, and location

of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. The Service contacts are Chris Nagano, Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office (916) 414-6600, and Dan Crum, Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660. The California Department of Fish and Game contact is Mr. Scott Wilson at (707) 944-5563. Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game

Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days following each year of construction or within sixty (60) calendar days of any break in construction activity lasting more than sixty (60) calendar days. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California tiger salamander, if any; (v) occurrences of incidental take; (vi) documentation of employee environmental education; and (vii) other pertinent information. The reports shall be addressed to the Coast-Bay Branch Chief of the Endangered Species Program, Sacramento Fish and Wildlife Office.

Caltrans shall report to the Service any information about take or suspected take of listed wildlife species not authorized by this biological opinion. Caltrans must notify the Service via an email message and telephone within twenty-four (24) hours of receiving such information. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. The individual animal shall be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Chris Nagano, Division Chief, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600, and Resident Agent-in-Charge Dan Crum of the Service's Law Enforcement Division at (916) 414-6660.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

The Service requests notification of the implementation of any conservation recommendations in order to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats. We propose the following conservation recommendations:

1. Enhancing habitat connectivity and wildlife passage across roads as well as reducing road effects should be included in the *Purpose and Needs* section of environmental documents.
2. Caltrans should include a wildlife passage section in their biological assessments that include an analysis of the existing passage and how the project will affect passage. The analysis should include identification of the species' resources on both sides of the project boundaries, an appropriately timed road mortality survey to identify "hot spots", and strategic locations where the species could benefit from the enhancement of an existing crossing or the installation of a new crossing. Caltrans District 4 should coordinate with their headquarters office and the University of California at Davis Road Ecology Center to develop a passage and road effects approach. Further guidance is provided by FHWA's *Wildlife Vehicle Collision Reduction Study* available at:
<http://www.fhwa.dot.gov/environment/hconnect/wvc/index.htm> (FHWA 2008).
3. Roadways can constitute a major barrier to wildlife movement. Therefore, Caltrans should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by the California tiger salamander, other listed animals, and wildlife. Include photographs, plans, and other information in biological assessments if "wildlife friendly" crossings are incorporated into projects. Efforts should be made to establish upland culverts designed specifically for wildlife movement rather than accommodations for hydrology. Transportation agencies should also acknowledge the value of enhancing human safety by providing safe passage for wildlife in their early project design.
4. Caltrans District 4 should coordinate with other Caltrans district offices, the Arizona DOT, the Montana DOT, the Washington State DOT, the Minnesota DOT, the Wisconsin DOT, and other state department of transportations to learn how such features can be effective and feasible.
5. Caltrans should use the system they have developed to keep track of road mortality records. For reference, the Washington State DOT developed a Wildlife Carcass Removal Database where they record information submitted by their maintenance crews (http://www.wsdot.wa.gov/Environment/Biology/bio_esa.htm). The importance of such a system is demonstrated by the public-access reporting system used in Idaho that resulted in more than double the previous DOT road mortality estimates (Kociolek 2009).
6. Caltrans should consider participating in regional habitat conservation planning in Solano County for the California tiger salamander, other listed species, and sensitive species.
7. Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California tiger salamander and other listed species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate. Efforts should be made to preserve habitat along roadways in association with wildlife crossings.

8. Caltrans should continue to pursue multifaceted compensation packages such as the one developed for the proposed U.S. Interstate 580/Isabel Avenue Interchange Construction Project (Service File #1-1-07-F-0280) on future formal consultations with the Service.
9. Caltrans should continue to develop and implement their Early Statewide Biological Mitigation Planning Project that has been developed by the University of California at Davis, Road Ecology Center through Caltrans funding.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project in Solano County, California. As provided in 50 CFR §402.16 and in the *Terms and Conditions* of this biological opinion, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions concerning this opinion on the proposed Solano Highway 12, Currie Road to Liberty Island Road Shoulder Widening Project in Solano County, California, please contact John Cleckler or Ryan Olah at the letterhead address or at (916) 414-6600.

Sincerely,


Susan K. Moore
Field Supervisor

cc:

John Yeakel and Brian Brandert, California Department of Transportation, Oakland, California
Scott Wilson, Melissa Escaron, California Department of Fish and Game, Yountville, California

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Appendix F Species List

<i>Scientific Name</i>	Common Name	Status ¹	Specific Habitat Requirements	Habitat Present or Absent ²	Rationale
<i>Acipenser medirostris</i>	green sturgeon	FP	Spawn in the Sacramento River and Klamath River; preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	Habitat not present.
<i>Ambystoma californiense</i>	California tiger salamander	FT	Populations in Sonoma County, need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	P / Inferred	Project is within current and historical range, nearby potential breeding and upland habitat, critical habitat unit (2) 4.3 miles away
<i>Branchinecta conservatio</i>	conservancy fairy shrimp	FE	http://www.fws.gov/sacramento/es/animal_spp_acct/conserv_shrimp.pdf	A	Project is within current and historical range. However, a habitat assessment survey performed by Dr. Richard Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, enclosed report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	Endemic to the grasslands of the Central Valley; central and south coast mountains in astatic rain-filled pools; inhabit small, clear-water sandstone-depression pools and grassed swale.	A	Project is within current and historical range. However, a habitat assessment survey performed by Dr. Richard Arnold concluded that the absence of nearby associated vernal pools and playas within and outside of study area reduces the likelihood of this species to occur (Arnold 2008-see, enclosed report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT	Sandy beaches, salt pond levees and shores of large alkali lakes; needs sandy, gravelly, or friable soils for nesting.	A	Habitat not present.
<i>Cirsium hydrophilum var. hydrophilum</i>	Suisun thistle	FE	Salt marsh; endemic to the Sacramento-San Joaquin Delta, known only from Solano County; grows with <i>Scirpus</i> , <i>Distichlis</i> near small watercourses within saltmarsh, 0-1 meters.	A	Habitat not present.

<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	Suisun thistle	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present.
<i>Cordylanthus mollis</i> ssp. <i>mollis</i>	soft bird's-beak	FE	Coastal salt marsh with <i>Distichlis</i> , <i>Salicornia</i> , <i>Frankenia</i> , 0-3 meters.	A	Habitat not present.
<i>Cordylanthus mollis</i> ssp. <i>mollis</i>	soft bird's-beak	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present.
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	Occurs in Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>).	A	Habitat not present; no host plant within project limits. In a habitat assessment survey performed by Dr. Richard Arnold, Dr. Arnold concluded "the valley elderberry longhorn beetle would not occur there [in the project area]" because "no elderberries were observed." (Arnold 2008-see, enclosed report).
<i>Elaphrus viridis</i>	Delta green ground beetle	FT	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation with 25-100 percent cover.	A	Habitat not present. In a habitat assessment survey performed by Dr. Richard Arnold, Dr. Arnold "did not find any potentially suitable habitat for the Delta Green Ground beetle due to the absence of vernal pools and playa pools." "The Solano County soils map indicates that Pescadero clays do not occur throughout the BSA. The intensive agriculture and other land uses are not compatible with this beetle." (Arnold 2008-see, enclosed report).
<i>Hypomesus transpacificus</i>	Critical habitat, delta smelt	FT	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.
<i>Hypomesus transpacificus</i>	Delta smelt	FT, ST	Sacramento-San Joaquin Delta, seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay; seldom found at salinities > 10 parts per thousand (ppt), most often at salinities < 2 ppt.	A	Habitat not present.
<i>Lasthenia conjugens</i>	Contra Costa goldfields	FE	Valley and foothill grassland, vernal pools, and cismontane woodland; extirpated from most of its range, 1-445 meters.	A	Project is within current and historical range. However, a focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants...detected during protocol-level surveys." (Howald 2008-see, enclosed report).
<i>Lasthenia conjugens</i>	Contra Costa goldfields	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
<i>Lepidurus packardi</i>	vernal pool tadpole shrimp	FE	Inhabits vernal pools and swales found in grass bottomed swales of unplowed grasslands.	A	Project is within current and historical range. However, a habitat assessment survey, performed by Dr. Richard

					Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, attached report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Lepidurus packardi</i>	vernal pool tadpole shrimp, critical habitat	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present. A habitat assessment survey, performed by Dr. Richard Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, attached report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Neostapfia colusana</i>	Colusa grass	FT, SE	Vernal pools, adobe soils, 5-110 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
<i>Oncorhynchus kisutch</i>	coho salmon - Central California Coast ESU	FE, SE (Ecologically Significant Unit)	Federal listing = populations between Punta Gorda and San Lorenzo River; State listing = populations south of San Francisco Bay only; require beds of loose, silt-free, coarse gravel for spawning; also need cover, cool water, and sufficient dissolved oxygen.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
<i>Oncorhynchus kisutch</i>	Critical habitat - coho salmon - Central California Coast ESU	PX	http://www.nwr.noaa.gov/lslmon/salmesa/cohocca.htm	A	Critical habitat not present.
<i>Oncorhynchus mykiss</i>	Central Valley steelhead	FT	Populations in the Sacramento and San Joaquin Rivers and their tributaries.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
<i>Oncorhynchus mykiss</i>	Central Valley steelhead, critical habitat	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.
<i>Oncorhynchus mykiss irideus</i>	Central California Coastal steelhead	FT	From Russian River, south to Soquel Creek and to, but not including, Pajaro River; also San Francisco and San Pablo Bay basins.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
<i>Oncorhynchus mykiss irideus</i>	Central California Coastal steelhead,	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.

	critical habitat				
<i>Oncorhynchus tshawytscha</i>	Critical habitat - Central Valley spring-run chinook salmon	PX	http://www.nwr.noaa.gov/1salmon/salmesa/chincvs.htm	A	Critical habitat not present.
<i>Oncorhynchus tshawytscha</i>	Central Valley spring-run chinook salmon	FT	Populations spawning in the Sacramento and San Joaquin Rivers and their tributaries.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
<i>Oncorhynchus tshawytscha</i>	Critical habitat - winter-run chinook salmon	PX	http://www.nwr.noaa.gov/1salmon/salmesa/chinsrv.htm	A	Critical habitat not present.
<i>Oncorhynchus tshawytscha</i>	winter-run chinook salmon	FE, SE	Sacramento River below Keswick Dam; spawns in the Sacramento River but not in the tributary streams; requires clean, cold water over gravel beds with water temperature between 6 and 14° C for spawning.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
<i>Orcuttia inaequalis</i>	San Joaquin Valley orcutt grass	FT, SE	Vernal pools, 30-755 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found “no federally listed plants... detected during protocol-level surveys.” (Howald 2008-see, enclosed report).
<i>Pelecanus occidentalis californicus</i>	California brown pelican	FE, SE	Colonial nester on coastal islands just outside the surf line, nests of small to moderate size which afford immunity from attack by ground-dwelling predators	A	Habitat not present.
<i>Rallus longirostris obsoletus</i>	California clapper rail	FE, SE	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay; associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	A	Habitat not present.
<i>Rana aurora draytonii</i>	California red-legged frog	FT	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval development; must have access to estivation habitat.	A	Habitat not present. There are no permanent sources of deep water with dense, shrubby, or emergent riparian vegetation within the action area.
<i>Rana aurora draytonii</i>	Critical habitat - CA red-legged frog	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present. There are no permanent sources of deep water with dense, shrubby, or emergent riparian vegetation within the action area.
<i>Reithrodontomys raviventris</i>	salt-marsh harvest mouse	FE, SE	Only in the saline emergent wetlands of San Francisco Bay and its tributaries, pickleweed is primary habitat.	A	Habitat not present.

<i>Speyeria callippe callippe</i>	callippe silverspot butterfly	FE	Restricted to the northern coastal scrub of the San Francisco Peninsula, host plant is <i>Viola pedunculata</i> .	A	Habitat not present.
<i>Sternula antillarum browni</i>	California least tern	FE, SE	Nesting along the coast, on bare or vegetated substrates.	A	Habitat not present.
<i>Thamnophis gigas</i>	giant garter snake	FT, ST	Freshwater marshes, low gradient streams, drainage canals, and irrigation ditches.	A	Habitat not present. A habitat assessment survey was performed by Steve Foreman, Wildlife Biologist, which concluded that "the study area does not support suitable habitat for the giant garter snake and there is no evidence that this species occurs or would be likely to occur along drainages in this area." (Foreman 2008-see, enclosed report).
<i>Trifolium amoenum</i>	showy Indian clover	FE	Valley and foothill grassland, coastal bluff scrub, and swales; sometimes on serpentine soil, 5-560 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
<i>Tuctoria mucronata</i>	Crampton's tuctoria or Solano grass	FE, SE	Vernal pools and valley and foothill grassland, endemic to Solano and Yolo Counties, 5-10 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).

Appendix F Species List

Scientific Name	Common Name	Status ¹	Specific Habitat Requirements	Habitat Present or Absent ²	Rationale
<i>Acipenser medirostris</i>	green sturgeon	FP	Spawn in the Sacramento River and Klamath River; preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	Habitat not present.
<i>Ambystoma californiense</i>	California tiger salamander	FT	Populations in Sonoma County, need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	P / Inferred	Project is within current and historical range, nearby potential breeding and upland habitat, critical habitat unit (2) 4.3 miles away
<i>Branchinecta conservatio</i>	conservancy fairy shrimp	FE	http://www.fws.gov/sacramento/es/animal_spp_acct/conserv_shrimp.pdf	A	Project is within current and historical range. However, a habitat assessment survey performed by Dr. Richard Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, enclosed report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	Endemic to the grasslands of the Central Valley; central and south coast mountains in astatic rain-filled pools; inhabit small, clear-water sandstone-depression pools and grassed swale.	A	Project is within current and historical range. However, a habitat assessment survey performed by Dr. Richard Arnold concluded that the absence of nearby associated vernal pools and playas within and outside of study area reduces the likelihood of this species to occur (Arnold 2008-see, enclosed report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT	Sandy beaches, salt pond levees and shores of large alkali lakes; needs sandy, gravelly, or friable soils for nesting.	A	Habitat not present.
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	Suisun thistle	FE	Salt marsh; endemic to the Sacramento-San Joaquin Delta, known only from Solano County; grows with <i>Scirpus</i> ,	A	Habitat not present.

			Distichlis near small watercourses within saltmarsh, 0-1 meters.		
Cirsium hydrophilum var. hydrophilum	Suisun thistle	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present.
Cordylanthus mollis ssp. mollis	soft bird's-beak	FE	Coastal salt marsh with Distichlis, Salicornia, Frankenia, 0-3 meters.	A	Habitat not present.
Cordylanthus mollis ssp. mollis	soft bird's-beak	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present.
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT	Occurs in Central Valley of California, in association with blue elderberry (Sambucus mexicana).	A	Habitat not present; no host plant within project limits. In a habitat assessment survey performed by Dr. Richard Arnold, Dr. Arnold concluded "the valley elderberry longhorn beetle would not occur there [in the project area]" because "no elderberries were observed." (Arnold 2008-see, enclosed report).
Elaphrus viridis	Delta green ground beetle	FT	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation with 25-100 percent cover.	A	Habitat not present. In a habitat assessment survey performed by Dr. Richard Arnold, Dr. Arnold "did not find any potentially suitable habitat for the Delta Green Ground beetle due to the absence of vernal pools and playa pools." "The Solano County soils map indicates that Pescadero clays do not occur throughout the BSA. The intensive agriculture and other land uses are not compatible with this beetle." (Arnold 2008-see, enclosed report).
Hypomesus transpacificus	Critical habitat, delta smelt	FT	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.
Hypomesus transpacificus	Delta smelt	FT, ST	Sacramento-San Joaquin Delta, seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay; seldom found at salinities > 10 parts per thousand (ppt), most often at salinities < 2 ppt.	A	Habitat not present.
Lasthenia conjugens	Contra Costa goldfields	FE	Valley and foothill grassland, vernal pools, and cismontane woodland; extirpated from most of its range, 1-445 meters.	A	Project is within current and historical range. However, a focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants...detected during protocol-level surveys." (Howald 2008-see, enclosed report).
Lasthenia conjugens	Contra Costa goldfields	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior

					Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
Lepidurus packardi	vernal pool tadpole shrimp	FE	Inhabits vernal pools and swales found in grass bottomed swales of unplowed grasslands.	A	Project is within current and historical range. However, a habitat assessment survey, performed by Dr. Richard Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, attached report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
Lepidurus packardi	vernal pool tadpole shrimp, critical habitat	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical Habitat not present. A habitat assessment survey, performed by Dr. Richard Arnold concluded that this species is not likely to occur due to absence of suitable habitat (i.e., vernal pools and playa pools) within the project area (Arnold 2008-see, attached report). This conclusion has been proven correct by the results of the protocol level surveys, which found no branchiopod species within the study area.
Neostapfia colusana	Colusa grass	FT, SE	Vernal pools, adobe soils, 5-110 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
Oncorhynchus kisutch	coho salmon - Central California Coast ESU	FE, SE (Ecologically Significant Unit)	Federal listing = populations between Punta Gorda and San Lorenzo River; State listing = populations south of San Francisco Bay only; require beds of loose, silt-free, coarse gravel for spawning; also need cover, cool water, and sufficient dissolved oxygen.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
Oncorhynchus kisutch	Critical habitat - coho salmon - Central California Coast ESU	PX	http://www.nwr.noaa.gov/1salmon/salmesa/cohocca.htm	A	Critical habitat not present.
Oncorhynchus mykiss	Central Valley steelhead	FT	Populations in the Sacramento and San Joaquin Rivers and their tributaries.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the

					action area.
Oncorhynchus mykiss	Central Valley steelhead, critical habitat	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.
Oncorhynchus mykiss irideus	Central California Coastal steelhead	FT	From Russian River, south to Soquel Creek and to, but not including, Pajaro River; also San Francisco and San Pablo Bay basins.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
Oncorhynchus mykiss irideus	Central California Coastal steelhead, critical habitat	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present.
Oncorhynchus tshawytscha	Critical habitat - Central Valley spring-run chinook salmon	PX	http://www.nwr.noaa.gov/1salmon/salmesa/chincvs.htm	A	Critical habitat not present.
Oncorhynchus tshawytscha	Central Valley spring-run chinook salmon	FT	Populations spawning in the Sacramento and San Joaquin Rivers and their tributaries.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
Oncorhynchus tshawytscha	Critical habitat - winter-run chinook salmon	PX	http://www.nwr.noaa.gov/1salmon/salmesa/chinsrw.htm	A	Critical habitat not present.
Oncorhynchus tshawytscha	winter-run chinook salmon	FE, SE	Sacramento River below Keswick Dam; spawns in the Sacramento River but not in the tributary streams; requires clean, cold water over gravel beds with water temperature between 6 and 14° C for spawning.	A	Habitat not present, in that there are no salmonid creeks or tributaries to salmonid creeks within the action area.
Orcuttia inaequalis	San Joaquin Valley orcutt grass	FT, SE	Vernal pools, 30-755 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
Pelecanus occidentalis californicus	California brown pelican	FE, SE	Colonial nester on coastal islands just outside the surf line, nests of small to moderate size which afford immunity from attack by ground-dwelling predators	A	Habitat not present.
Rallus longirostris obsoletus	California clapper rail	FE, SE	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay; associated with abundant growths of pickleweed, but feeds away from cover on	A	Habitat not present.

			invertebrates from mud-bottomed sloughs.		
Rana aurora draytonii	California red-legged frog	FT	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval development; must have access to estivation habitat.	A	Habitat not present. There are no permanent sources of deep water with dense, shrubby, or emergent riparian vegetation within the action area.
Rana aurora draytonii	Critical habitat - CA red-legged frog	PX	http://sacramento.fws.gov/es/crit_hab_maps.htm	A	Critical habitat not present. There are no permanent sources of deep water with dense, shrubby, or emergent riparian vegetation within the action area.
Reithrodontomys raviventris	salt-marsh harvest mouse	FE, SE	Only in the saline emergent wetlands of San Francisco Bay and its tributaries, pickleweed is primary habitat.	A	Habitat not present.
Speyeria callippe callippe	callippe silverspot butterfly	FE	Restricted to the northern coastal scrub of the San Francisco Peninsula, host plant is Viola pedunculata.	A	Habitat not present.
Sternula antillarum browni	California least tern	FE, SE	Nesting along the coast, on bare or vegetated substrates.	A	Habitat not present.
Thamnophis gigas	giant garter snake	FT, ST	Freshwater marshes, low gradient streams, drainage canals, and irrigation ditches.	A	Habitat not present. A habitat assessment survey was performed by Steve Foreman, Wildlife Biologist, which concluded that "the study area does not support suitable habitat for the giant garter snake and there is no evidence that this species occurs or would be likely to occur along drainages in this area." (Foreman 2008-see, enclosed report).
Trifolium amoenum	showy Indian clover	FE	Valley and foothill grassland, coastal bluff scrub, and swales; sometimes on serpentine soil, 5-560 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).
Tuctoria mucronata	Crampton's tuctoria or Solano grass	FE, SE	Vernal pools and valley and foothill grassland, endemic to Solano and Yolo Counties, 5-10 meters.	A	Habitat not present. A focused special-status plant survey conducted by Ann Howald, Senior Botanist, found "no federally listed plants... detected during protocol-level surveys." (Howald 2008-see, enclosed report).

Appendix G Summary Floodplain Encroachment Report

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

Dist. 04 Co. 502 Rte. 12 K.P. _____
 Project No.: 04 0000 0832 Bridge No. _____
 Limits: 20.6/21.3 and 22.6/23.7

Floodplain Description: 100 YEAR FLOODPLAIN

- | | No | Yes |
|---|-------------------------------------|-------------------------------------|
| 1. Is the proposed action a longitudinal encroachment of the base floodplain? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Are the risks associated with the implementation of the proposed action significant? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Will the proposed action support probable incompatible floodplain development? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Are there any significant impacts on natural and beneficial floodplain values? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q). | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Are Location Hydraulic Studies that document the above answers on file? If not explain. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

PREPARED BY:


 Signature - Dist. Hydraulic Engineer

8/31/2010
 Date


 Signature - Dist. Environmental Branch Chief

31 August 2010
 Date


 Signature - Dist. Project Engineer

8/31/10
 Date