ADDENDUM SHEET

Date: August 10, 2011

Project: Los Osos Valley Road/U.S. 101 Interchange Improvements Project
EA: 05-0H7300
Location: 05-SLO-101 (PM 25.5/26.3)

Los Osos Valley Road/U.S. 101 Interchange Improvements Project 05-SLO-101 (PM 25.5/26.3)

The following corrections are made to the ***Natural Environmental Study Report*** *including the Biological Assessment/NOAA and the Biological Assessment/USFWS for the Los Osos Valley Road/US 101 Interchange Improvements Project, City of San Luis Obispo, California* (March 2008).

Changes resulting from the project description are reflected below. The complete updated project description is attached.

The Natural Environmental Study Report is revised by reference to the attached updated project description as follows:

- The removal of the two new culverts under Route 101,
- The removal of the Prefumo Creek channel work between the southbound off-ramp and the mainline of Route 101,
- Sediment removal is no longer a component of the project,
- The addition of Rock Slope Protection around the Los Osos Valley Road bridge piers, and
- The removal of retention basin.

Section/Page	Change From	Change To
Figure 1-2 and 1-3, 3-1a, Exhibit A, BA/NOAA Figure 1-2, 4-1, BA/USFWS Figure 4	Indicated locations of the proposed 7' Prefumo Creek culvert under US 101.	All indications of the proposed 7' Prefumo Creek culvert under US 101 were eliminated see attached Figures 1-2 and 1-3, BA/NOAA Figure 1-2, BA/USFWS Figure 4.
S-4; Section S.3.3	Sentence: "Double 84-inch reinforced concrete pipe will be added above the existing 18-by-8 foot concrete box culvert on Prefumo Creek."	By reference to this Addendum sheet all references to the double 84-inch reinforced concrete pipe are removed from the NES.
1-4; Section 1.4.1	Sentence: "Construct retention basin within the northbound loop on ramp."	By reference to this Addendum sheet all references to the retention basin are removed from the NES.

1-6; Section 1.4.2	Sentence: "Construct retention basin within the northbound loop on ramp."	By reference to this Addendum sheet all references to the retention basin are removed from the NES.
1-7; Section 1.4.3	Sentence: "The two seasonal wetlands, located in the artificially created basins between U.S. 101 and existing northbound on- and off-ramps, will be restored onsite as a retention basin after the new ramps are constructed."	By reference to this Addendum sheet the sentence has been revised as: "The two seasonal wetlands, located in the artificially created basins between U.S. 101 and existing northbound on- and off-ramps, will be restored onsite as biofiltration swales and strips after the new ramps are constructed."
4-8; Section 4.1.2.3	Sentence: "Implementation of Alternative 3 would result in the permanent loss of 0.01 hectare (0.03 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the retention basin within the northbound loop onramp."	By reference to this Addendum sheet the sentence has been revised as: "Implementation of Alternative 3 would result in the permanent loss of 0.01 hectare (0.03 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the biofiltration swales and strips within the northbound loop onramp."
4-8; Section 4.1.2.3	Sentence: "Implementation of Alternative 6 would result in the permanent loss of 0.01 hectare (0.02 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the retention basin within the northbound loop onramp."	By reference to this Addendum sheet the sentence has been revised as: "Implementation of Alternative 6 would result in the permanent loss of 0.01 hectare (0.02 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the biofiltration swales and strips within the northbound loop onramp."
4-9; Section 4.1.2.4	BIO-6 is revised based on the removal of the retention basin. "…Permanent impacts on seasonal wetland will first be mitigated on-site in the retention basin…these wetlands will be restored onsite after the completion of the retention basin construction…The basin south of the on-ramp will be excavated to a deeper level for construction of a vegetated retention basin that will provide biofiltration of runoff."	By reference to this Addendum sheet BIO-6 has been changed to: "The City will compensate for permanent loss of seasonal wetlands at a minimum ratio of 2:1 (2 hectares/acres restored for every 1 hectare/acre temporarily affected). Permanent impacts on seasonal wetland will first be mitigated on-site. Any remaining seasonal wetland mitigation that cannot be created on-site will be created offsite at an environmentally approved location to be determined, such as the City-owned Johnson Ranch or

		through the San Luis Obispo Conservancy. While these commitments are made in the environmental document, final locations and quantities for compensation will be confirmed through coordination with state and federal agencies as part of the permitting process and final design phase and will be based on the impacts calculated and presence of appropriate environmental conditions for creation. If Alternative 3 is implemented, total required compensation for impacts on seasonal wetland will be 0.16 hectare (0.40 acre). If Alternative 6 is implemented, total compensation for impacts on seasonal wetlands will be 0.15 hectare (0.36 acre). Because the two of the affected seasonal wetlands occur within artificially created basins between U.S. 101 and the northbound on- and offramps, these wetlands will be restored onsite after construction. To ensure sufficient ponding to support wetland vegetation, the basin north of the on-ramp will be excavated to pre-project conditions and planted with a native seed mix.
4-33/36; Section 4.4.1.2	Steelhead are also found in Prefumo Creek but not mentioned in Measures BIO-17, BIO-19, and BIO-21.	By reference to this Addendum sheet Prefumo Creek has been added to Measures BIO-17, BIO-19, and BIO-21.
4-33/36; Section 4.4.1.2	No mention of RCB modification on Prefumo Creek offramp as indicated on plans.	By reference to this Addendum sheet the RCB modification on Prefumo Creek offramp is included.
4-37; Section 4.4.1.2	Bullet mentions removing fine sediments downstream from the LOVR bridge.	By reference to this Addendum sheet the removal of fine sediment downstream from the LOVR bridge have been removed from the NES.

4-38; Section 4.4.1.3	Bullets refer to additional box culvert capacity under route 101 and the removal of deposited material from SLO Creek under the LOVR bridge.	By reference to this Addendum sheet the additional box culvert under 101 and the removal of deposited material from SLO Creek under the LOVR bridge have been removed from the NES.
4-41; Section 4.4.1.3	Remove reference/2nd paragraph, "The double 84-inch reinforced concrete pipe that…"	By reference to this Addendum sheet all references to the double 84-inch reinforced concrete pipe are removed from the NES.
4-41, 4-42, & 4-47; Sections 4.4.1.3 & 4.4.2.3	The mention of "diversion" should be plural since stream diversion is also required in Prefumo Creek. Need to include length of diversion for Prefumo Creek RCB under southbound offramp.	By reference to this Addendum sheet diversion is now plural to include the required stream diversion in Prefumo Creek. The length of diversion for Prefumo Creek RCB under the southbound offramp is 60 feet.
4-42; Section 4.4.1.3	Temporary diversion open-lined channel is not feasible for the RCB replacement on Prefumo Creek under the southbound off ramp due to inadequate space for such a diversion methodology. The diversion needs to be a closed pipe system allowing for upstream movement of steelhead including juvenile.	By reference to this Addendum sheet the temporary diversion method used for the RCB modification on Prefumo Creek under the southbound offramp has been updated to include the option for a closed pipe system allowing for upstream movement of steelhead including juvenile.
5-7; Section 5.1.1.2	Several Paragraphs on the box culvert under Route 101.	By reference to this Addendum sheet all references to the box culvert under the 101 are removed from the NES.
5-8; Section 5.1.1.2	The section on Rock Slope Protection specifically states that there would be no RSP on SLO Creek at the LOVR bridge. There is a section regarding sediment removal from SLO Creek at the LOVR bridge.	By reference to this Addendum sheet the addition of RSP around LOVR bridge piers has been added. Also, all references to sediment removal from SLO Creek at the LOVR bridge are removed from the NES.

5-11; Section 5.1.1.2	Remove reference/3rd paragraph, "The double 84-inch reinforced concrete pipe that…"	By reference to this Addendum sheet all references to the double 84-inch reinforced concrete pipe are removed from the NES.
5-11; Section 5.1.1.2	Sediment Removal on SLO Creek.	By reference to this Addendum sheet all discussion of sediment removal on SLO Creek is removed from the NES.
5-11; Section 5.1.1.2	4th paragraph refers to work in Prefumo Creek but discussion actually refers to work in San Luis Creek.	By reference to this Addendum sheet the discussion has been changed to reflect work in San Luis Obispo Creek.
5-18; Section 5.2.1	2nd paragraph after "Freshwater Migration Corridors", "Diversion" should be plural to include both creeks.	By reference to this Addendum sheet the diversion has been changed to reflect diversion in both Prefumo Creek as well as San Luis Obispo Creek.

Prepared By: Namat Hosseinion Date: 8-10-11

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PROJECT DESCRIPTION

Build Alternatives

Two build alternatives (Alternative 3 and Alternative 6) have been identified to satisfy the purpose and need for the project. Alternative 3 has been identified by the City of San Luis Obispo as the locally preferred alternative. Alternative 3 and Alternative 6 are described below.

Common Design Features of the Build Alternatives

This project is intended to accommodate current and future travel demands. Calle Joaquin Road south of LOVR has been realigned so that the existing "T" intersection of LOVR and Calle Joaquin Road north of LOVR has been converted to a four-way intersection. The Calle Joaquin Road realignment was developed and completed by the Costco Wholesale Corporation as a condition of approval and mitigation measure for traffic impacts.

The project limits extend along LOVR between Auto Park Way to the west and South Higuera Street to the east covering a distance of 0.52 mile and along US 101 for about 2,500 feet south and 4,300 feet north of the LOVR overcrossing.

Under both build alternatives, the San Luis Obispo Creek arch culvert would be changed. Built in 1986, the existing three-barrel structural steel-plate arch culvert is a large structure, carrying LOVR over San Luis Obispo Creek. This project would widen and raise the roadway. These roadway changes require lengthening the culvert with a new structural steel arch (matching what exists) and increasing the loading on the existing culvert that would remain. To determine the feasibility of this increased loading, a structural analysis was conducted. The analysis showed that the existing culvert can easily carry the additional loading, making this a viable option.

Included in the project, along both sides of all project-related local streets, are sidewalks with grades and curb ramps at intersections, in compliance with Americans with Disabilities Act requirements. To help non-motorized transportation (such as pedestrians and bicyclists) cross the intersections, the project would limit use of free-slip ramps, include single-lane ramps, and review the southwest corner of the US 101 northbound off-ramp/LOVR to determine if a widened area is needed to create a bigger "landing" area.

A portion of the proposed Bob Jones City-to-Sea Bike Trail passes through the project. This project would provide bikeway access to connect to LOVR at the northbound on- and off-ramp intersection. Project design would not preclude connection of the Prefumo Creek trail extension to the future Bob Jones City-to-Sea Bike Trail (including possible extension of the trail under or over LOVR). Each build alternative would provide 6.5-foot Class II bike lanes throughout the project on both sides of LOVR. These lanes would connect to the existing 6-foot sidewalks in front of the Los Verdes Parks I and II developments. Sidewalks on both sides of the San Luis Obispo Creek bridge would be widened to accommodate Class I trails. Safety device placement, striping, and signage of the Class I trail would be completed once the location and alignment of the Bob Jones City-to-Sea Bike Trail is determined south of the interchange. Any at-grade crossings of the LOVR by the Bob Jones City-to-Sea Bike Trail would use appropriate and safe design guidelines for visibility and signal operations. Bicycle detector loops would be placed at all intersections that have traffic signals. Project design would remain consistent with the Bob Jones City-to-Sea Bike Trail Project Master Plan and the City of San Luis Obispo Bicycle Transportation Plan.

Both alternatives would:

1. Widen LOVR to four lanes from South Higuera Street to 600 feet west of Calle Joaquin to meet the existing four-lane section west of Calle Joaquin.
2. Extend the existing San Luis Obispo Creek culvert crossing to accommodate widened LOVR
3. Construct retaining walls to avoid Prefumo Creek and business impacts at LOVR and the US 101 southbound ramps.
4. Construct sidewalks and Class II bike lanes along both sides of LOVR.
5. Change the existing signals at the LOVR and US 101 ramp intersections.
6. Widen and rebuild the US 101 northbound off-ramp and build a retaining wall to avoid creek impacts.
7. Change the landscaping and sidewalks along LOVR at Los Verdes.
8. Change the striping, medians, and lane widths along LOVR at Los Verdes.
9. Restripe South Higuera Street to optimize the capacity of the South Higuera Street/LOVR intersection, given the widening of LOVR.
10. Include pedestrian crossing controls at all intersections that have traffic signals unless determined unsafe or detrimental to traffic conditions.
11. Further widen San Luis Obispo Creek bridge to accommodate a future Class I trail on either shoulder of the structure.
12. Use concrete paving at off-ramp ends.
13. Use street print (stamped/imprinted asphalt or concrete) through crosswalks for increased visibility.
14. Use rubberized asphalt concrete, as a project feature, on LOVR in front of the Los Verdes Parks I and II.
15. Restripe LOVR from two to four lanes in front of the Los Verdes Parks I and II driveways to assist with access.
16. Plant native landscaping within the intersections and ramps where appropriate.

Unique Features of Build Alternatives

Alternative 3—Minimum Build

Alternative 3 is the minimum build alternative for this project and is the locally preferred alternative. This alternative would widen LOVR between the recently constructed Calle Joaquin intersection with LOVR west of US-101 and the Los Verdes Park community east of US-101 to 4 lanes, construct a new two lane structure adjacent the existing LOVR Overcrossing, and widening San Luis Obispo Creek culvert crossing.

The actual work to be performed under the project includes:

1. Widen LOVR to four lanes from South Higuera Street to the existing four-lane section west of Calle Joaquin.

2. Extend the existing San Luis Obispo Creek culvert crossing to accommodate widened LOVR.

3. Construct retaining walls to avoid Prefumo Creek and business impacts at LOVR and the US 101 southbound ramps.

4. Construct sidewalks and Class II bike lanes along both sides of LOVR.

5. Change the existing signals at the LOVR and US 101 ramp intersections.

6. Widen and rebuild the US 101 northbound off-ramp and build a retaining wall to avoid creek impacts.

7. Change the landscaping and sidewalks along LOVR at Los Verdes.

8. Change the striping, medians, and lane widths along LOVR at Los Verdes.

9. Restripe South Higuera Street to optimize the capacity of the South Higuera Street/LOVR intersection, given the widening of LOVR.

10. Pavement section for ramps and LOVR will be 0.2' rubberized asphalt concrete over 0.3' hot mix asphalt over 1.67' aggregate based on the Life Cycle Pavement Cost Analysis findings. Concrete paving will be used at both off-ramp ends.

11. Use street print through crosswalks for increased visibility.

12. Use open-grade or rubberized asphalt on LOVR in front of the Los Verdes Parks I and II.

13. Plant native landscaping within the intersections and ramps where appropriate.

14. Construct retaining walls to avoid San Luis Obispo Creek impacts.

15. Construct a separate US 101 overcrossing to carry the two eastbound lanes with a split profile.

16. Raise the intersection of LOVR at the US 101 southbound ramps.

17. Construct new street lighting along LOVR.

18. Raise headwalls on Prefumo Creek box culvert under the southbound off-ramp to accommodate ramp raising and widening.

19. Widen the US 101 southbound off-ramp and construct retaining walls.

20. Change the storm drain system along LOVR to accommodate widening and profile changes.

21. Construct a standard acceleration lane from the southbound on-ramp.

Changes to Work to be Performed Resulting from Value Analysis and Public Comment

22. Include pedestrian crossing controls at all signalized intersections unless specific movements are determined unsafe or detrimental to traffic conditions.

23. Further widen San Luis Obispo Creek Bridge to accommodate a future Class I trail on either shoulder of the structure.

24. Restripe LOVR from two to four lanes in front of the Los Verdes Parks I and II driveways to assist with access.

25. Construct a right-turn lane from eastbound LOVR to northbound US-101 on-ramp.

26. Use concrete paving at off ramp termini.

27. Use imprinted AC for crosswalks for increased visibility, outside limits of state right-of-way.

28. Place bicycle detector loops at signalized intersections.

Alternative 6—Moderate Build, Near Full Standard

This alternative proposes to widen Los Osos Valley Road between Calle Joaquin west and the Los Verdes communities east of US 101 (see Figures 1.3-3 and 1.3-4). The existing LOVR overcrossing would be replaced to improve the profile, vertical clearance, and space required for the southbound hook off-ramp.

In addition, the existing northbound loop on-ramp to US 101 would be reconstructed, and the northbound off-ramp would be widened. A new northbound diagonal on-ramp to US 101 may be added in the northeast quadrant of the interchange as a phased improvement. An auxiliary lane would be added to northbound US 101 from the end of the northbound loop on-ramp to 1,000 feet beyond the end of the northbound diagonal on-ramp. The northbound diagonal on-ramp would be supported by retaining walls and an additional bridge over Prefumo Creek. The existing southbound on- and off-ramps from US 101 would be removed. South of LOVR, new/relocated southbound on- and off-ramps from US 101 would be constructed in a hook ramp configuration. Calle Joaquin south of LOVR is being realigned to accommodate the realigned southbound US 101 ramps and to create a four-way intersection with Calle Joaquin north LOVR.

The actual work to be performed under the project includes:

1. Widen LOVR to 4 lanes from South Higuera St. to 600 feet north of Calle Joaquin

2. Extend or reconstruct existing San Luis Obispo Creek Culvert Crossing to accommodate widened LOVR

3. Replace the LOVR US-101 Overcrossing

4. Relocate and reconstruct the southbound US-101 ramps

5. Reconstruct northbound US-101 loop on-ramp

6. Construct northbound US-101 slip on-ramp and merge lane to US-101

7. Construct northbound US-101 on-ramp bridge & retaining walls at Prefumo Creek

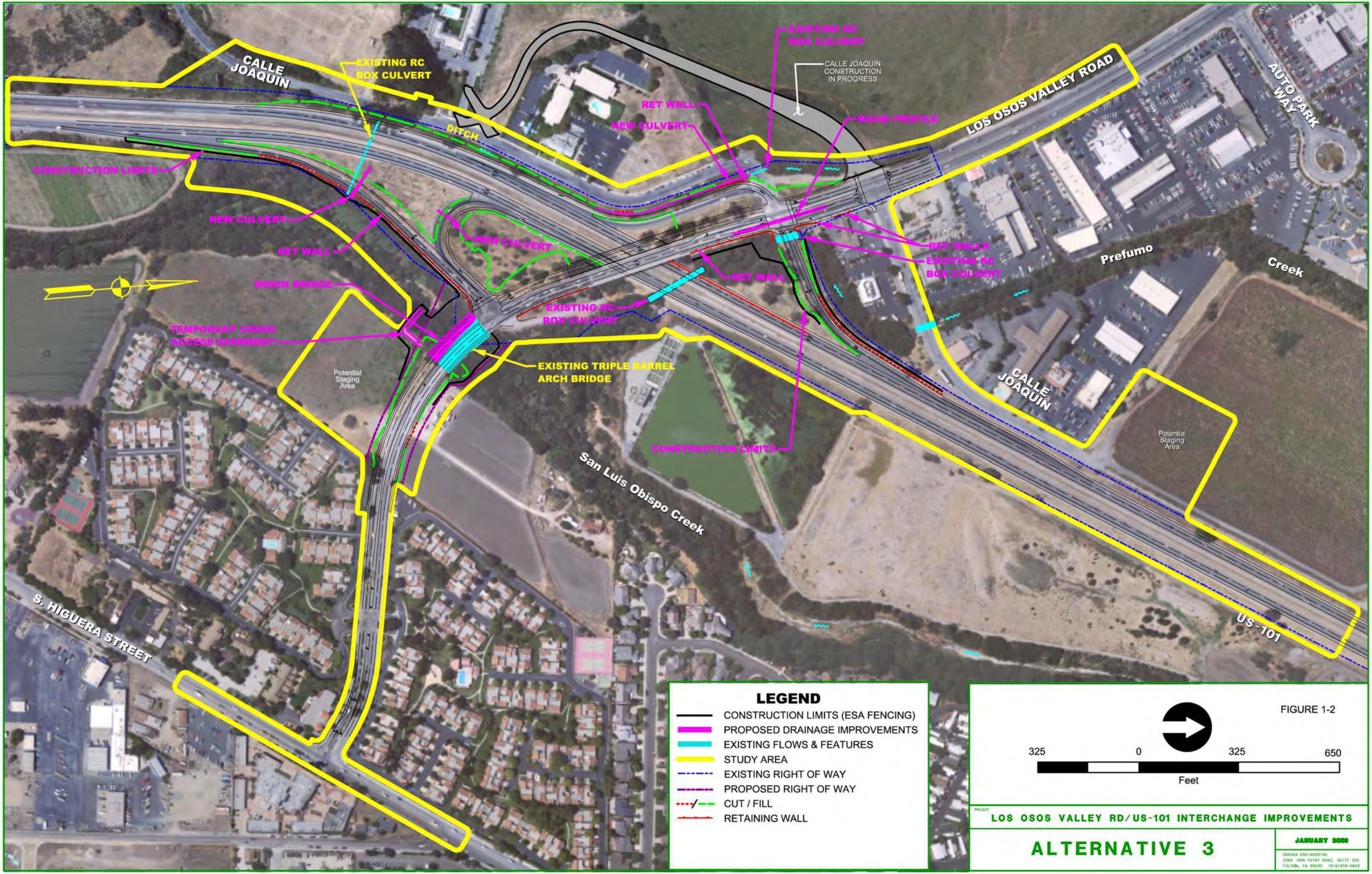
8. Construct signalized intersection of US-101 southbound ramps and Calle Joaquin

9. Construct sidewalks and combined bike lane/shoulder along LOVR
10. Construct new street lighting along LOVR and Calle Joaquin
11. Modify existing signals at LOVR/US-101 northbound off-ramp intersection
12. Abolish existing southbound US-101 ramps and Perfumo Creek Box Culvert
13. Widen US-101 northbound off-ramp and construct retaining wall
14. Extend the Perfumo Creek box culvert under US-101 for new southbound off ramp
15. Construct storm drain systems for LOVR and reconstruct ramps
16. Modify landscaping and sidewalks along LOVR at Los Verdes
17. Restripe South Higuera Street

No-Build Alternative

Environmental review must consider the effects of not implementing the proposed project. The No-Build Alternative provides a baseline for comparing the impacts of all alternatives.

Effects of the No-Build Alternative include deteriorating level of service, impacts to air quality, and continuing safety conditions. Unless operational improvements are made, future planned development and general regional growth will increase traffic volumes to a degree that all intersections in the vicinity of the LOVR/US 101 interchange would operate with severe congestion during both the morning and afternoon peak hours. This would result in congestion on US 101 from backups at the off-ramp intersections. This congestion would affect both local traffic on LOVR and regional traffic on US 101. Decreasing operational efficiency may negatively affect air quality and would likely affect existing safety


CALLE JOAQUIN
EXISTING RC BOX CULVERT
DITCH
CONSTRUCTION LIMITS
NEW CULVERT
RET WALL
WIDEN BRIDGE
TEMPORARY CREEK ACCESS EASEMENT
Potential Staging Area
NEW CULVERT
EXISTING RC BOX CULVERT
EXISTING TRIPLE BARREL ARCH BRIDGE
CONSTRUCTION LIMITS
San Luis Obispo Creek
S. HIGUERA STREET
EXISTING RC BOX CULVERT
CALLE JOAQUIN CONSTRUCTION IN PROGRESS
RET WALL
NEW CULVERT
RAISE PROFILE
RET WALL
RET WALLS
EXISTING RC BOX CULVERT
LOS OSOS VALLEY ROAD
AUTO PARK WAY
Prefumo
Creek
CALLE JOAQUIN
Potential Staging Area
US-101
LEGEND
CONSTRUCTION LIMITS (ESA FENCING)
PROPOSED DRAINAGE IMPROVEMENTS
EXISTING FLOWS & FEATURES
STUDY AREA
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
CUT / FILL
RETAINING WALL
FIGURE 1-2
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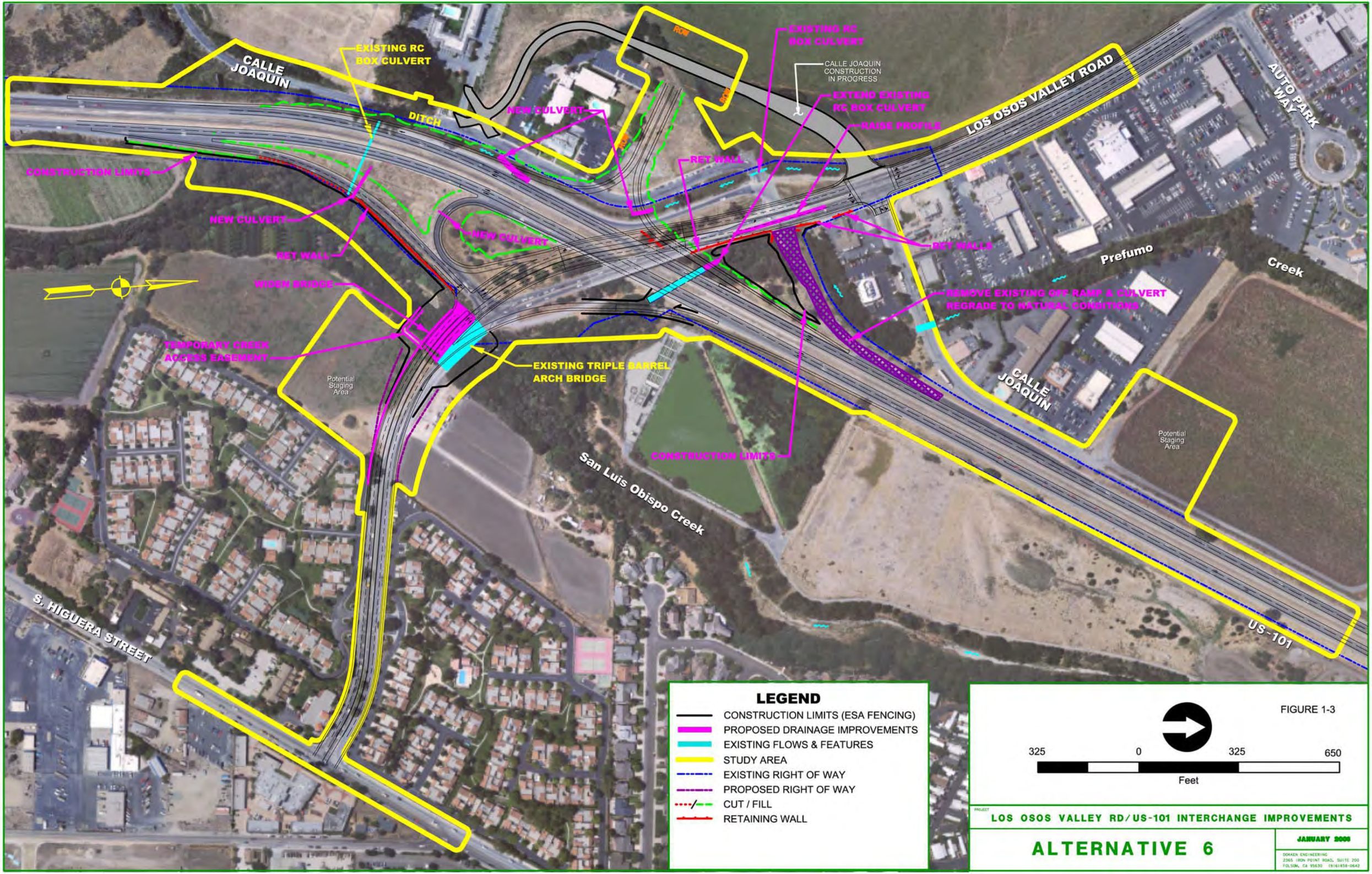
325
650
Feet
LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 3
JANUARY 2008


CALLE JOAQUIN
EXISTING RC BOX CULVERT
DITCH
NEW CULVERT
CONSTRUCTION LIMITS
NEW CULVERT
RET WALL
NEW CULVERT
WIDEN BRIDGE
TEMPORARY CREEK ACCESS EASEMENT
Potential Staging Area
EXISTING TRIPLE BARREL ARCH BRIDGE
San Luis Obispo Creek
CONSTRUCTION LIMITS
S. HIGUERA STREET
RET WALL
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CALLE JOAQUIN CONSTRUCTION IN PROGRESS
EXTEND EXISTING RC BOX CULVERT
RAISE PROFILE
LOS OSOS VALLEY ROAD
AUTO PARK WAY
RET WALLS
Prefumo
Creek
REMOVE EXISTING OFF RAMP & CULVERT
REGRADE TO NATURAL CONDITIONS
CALLE JOAQUIN
Potential Staging Area
US-101
LEGEND
CONSTRUCTION LIMITS (ESA FENCING)
PROPOSED DRAINAGE IMPROVEMENTS
EXISTING FLOWS & FEATURES
STUDY AREA
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
CUT / FILL
RETAINING WALL
FIGURE 1-3
325 0 325 650
Feet
PROJECT
LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 6
JANUARY 2009
DOKKEN ENGINEERING
2365 IRON POINT ROAD, SUITE 200
FOLSOM, CA 95630 (916)858-0642

Figure 3-1a
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Permanent Impact Area Under Alternative 3 (Minimum Build)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

325 0 325 650
Feet

Exhibit A
Delineation of Waters of the United States, Including Wetlands

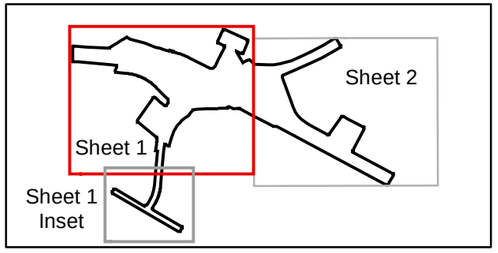
Los Osos Valley Road Interchange Project
San Luis Obispo, California

Wetland Type	Area (acres)
Jurisdictional Waters of the United States	
Wetlands	
Freshwater Marsh	1.07
*marsh #1**	*1.07*
Seasonal Wetland	0.25
*Drainage #1**	*0.02*
*Drainage #2**	*0.23*
Other Waters	
Seasonal Drainage	0.19
*Drainage #2**	*0.14*
SD-04 (*Froom Creek*)	0.05
Perennial Drainage	1.56
PD-01 (*San Luis Obispo Creek*)	0.84
PD-02 (*Prefumo Creek*)	0.72
Total Jurisdictional	**3.07**
Non-jurisdictional Wetlands and Drainages	
Freshwater Marsh	0.24
FWM-02	0.24
Seasonal Drainage	0.10
SD-03	0.09
SD-05	0.01
Seasonal Wetland	0.60
SW-01	0.41
SW-02	0.16
SW-03	0.03
Total Non-jurisdictional	**0.94**

* Features labeled in *red* were previously delineated as part of the Calle Joaquin Realignment Project by Morro Group, Inc., 2004.

Data Point
Existing Culvert
Delineation Area Boundary

Aerial Photo Source: City of San Luis Obispo, 2005



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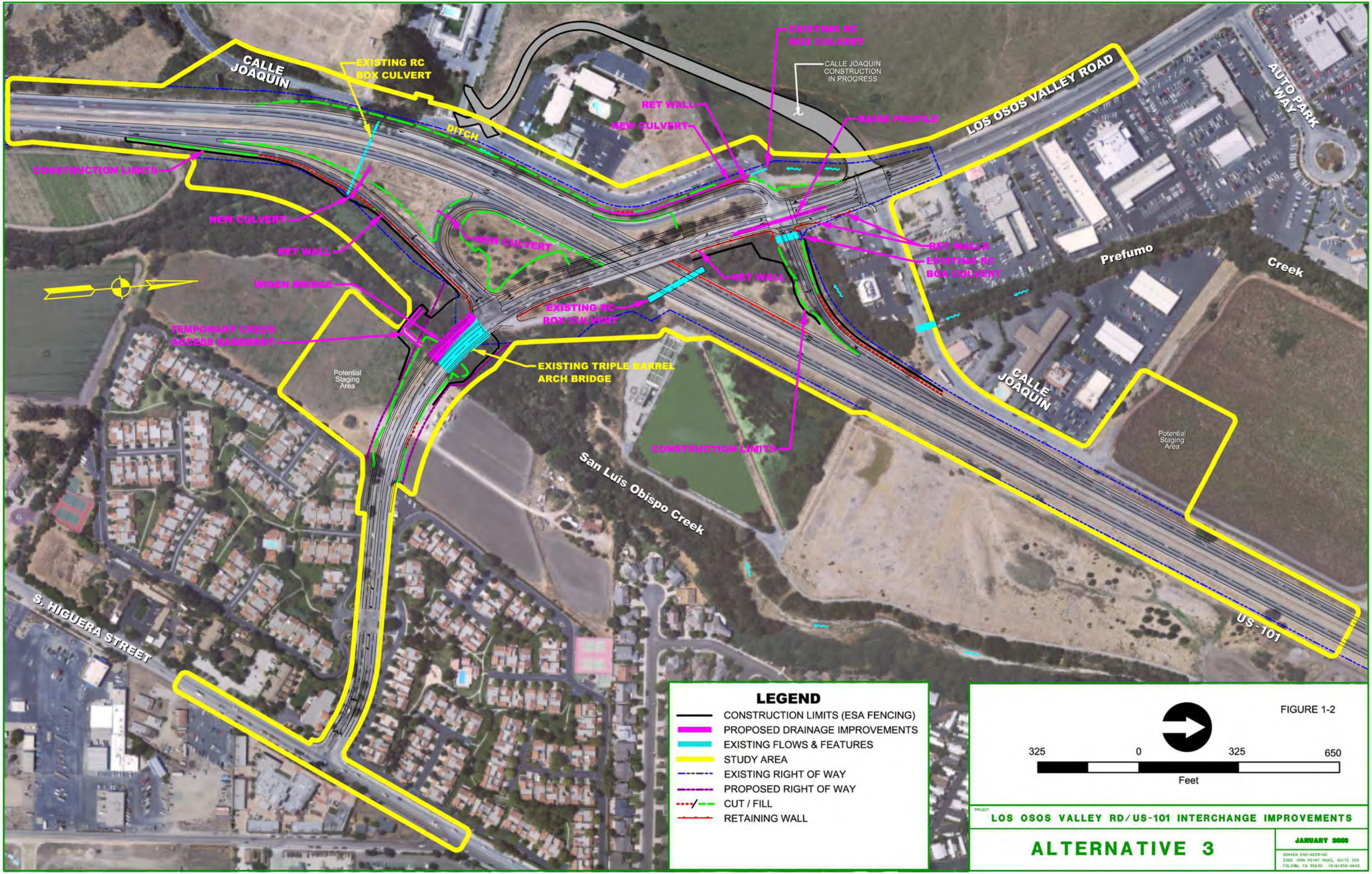
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LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 3
JANUARY 2008

Figure 4-1
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
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- Central Coast Arroyo Willow Riparian
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- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

325 0 325 650
Feet

Figure 4
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Permanent Impact Area Under Alternative 3 (Minimum Build)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

325 0 325 650
Feet

Los Osos Valley Road/
U.S. 101 Interchange Improvements Project

Natural Environment Study Report

Los Osos Valley Road/U.S. 101 Interchange Improvements Project
City of San Luis Obispo, San Luis Obispo County, California
05-SLO-101-PM 25.9-26.3
E.A.05-OH7300

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Natural Environment Study Report

Los Osos Valley Road/U.S. 101 Interchange Improvements Project
City of San Luis Obispo, San Luis Obispo County, California
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List of Acronyms and Abbreviations

BA	biological assessment
BMPs	best management practices
BO	biological opinion
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
City	City of San Luis Obispo
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CRLF	California red-legged frog
CSLC	California State Lands Commission
CWA	Clean Water Act
DPS	distinct population segments
EOs	Executive Orders
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FR	Federal Register
LOVR	Los Osos Valley Road
MBTA	Migratory Bird Treat Act
MOU	memorandum of understanding
NEPA	National Environmental Policy Act
NES	natural environment study
NHPA	National Historic Preservation Act
NOAA Fisheries	National Marine Fisheries Service
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NWPs	Nationwide permits
OHWM	ordinary high-water mark
PDT	Project Development Team
proposed project	the Los Osos Valley Road/U.S. 101 Interchange Project
RWQCBs	Regional Water Quality Control Boards
SAA	streambed alteration agreement
SHELL	State Highway Extra Legal Load
State Water Board	State Water Resources Control Board

SWANCC	S*olid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* [121 S.CT. 675, 2001]
SWPPP	storm water pollution prevention plan
TCR	Transportation Concept Report
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Summary

S.1 Project Description

The City of San Luis Obispo, in conjunction with the California Department of Transportation (Caltrans), is proposing to improve the Los Osos Valley Road/U.S. 101 interchange and Los Osos Valley Road (LOVR) in the City and County of San Luis Obispo. The proposed project involves widening the existing freeway bridge and an adjacent bridge crossing over San Luis Obispo Creek, and the possible relocation and reconfiguration of the freeway ramps, depending on the alternative chosen. Two build alternatives are being considered; under both alternatives, the San Luis Obispo Creek arch culvert will be modified.

S.2 Purpose and Need

The purpose of the proposed project is to improve traffic operations and safety on LOVR and the LOVR/U.S. 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to be designed such that it will not preclude the planned ultimate widening of U.S. 101 or future interchange improvements.

S.3 Summary of Results and Impacts

Natural resources were identified through coordination with resources agencies; a review of existing information; and a variety of field surveys conducted by Jones & Stokes and LSA Associates biologists. The following natural resource issues were documented or identified as having the potential to occur in the study area and therefore could be affected by the proposed project.

S.3.1 Waters of the United States, Including Wetlands

Potential waters of the United States including, perennial and seasonal drainages, seasonal wetlands, and freshwater marsh, were delineated in the study area. Under Alternative 3, up to 0.06 hectare (0.14 acre) of these potential waters of the United States would be permanently lost and 0.08 hectare ((0.19 acre) would be temporarily disturbed during construction of the proposed project (Table S-1). Under Alternative 6 up to 0.10 hectare (0.24 acre) of these potential waters of the United States would be permanently lost and 0.04 hectare (0.11 acre) would be temporarily disturbed during construction of the proposed project under Alternative 6 (Table S-1).

Table S-1. Permanent Loss and Temporary Effects on Natural Communities of Concern in the Study Area

Community Type	Alternative 3		Alternative 6	
	Permanently Affected Hectares (Acres)	Temporarily Affected Hectares (Acres)	Permanently Affected Hectares (Acres)	Temporarily Affected Hectares (Acres)
Central Coast arroyo willow riparian forest	0.16 (0.40)	0.34 (0.84)	0.41 (1.01)	0.21 (0.52)
Seasonal wetland[a]	0.01 (0.03)	0 (0)	0.01 (0.02)	0 (0)
Seasonal wetland[b]	0.07 (0.17)	0 (0)	0.07 (0.17)	0 (0)
Freshwater marsh[a]	0 (0)	0 (0)	0 (0)	0 (0)
Seasonal drainage[a]	0.02 (0.04)	0 (0)	0.03 (0.07)	0 (0)
Perennial drainage[a]	0.03 (0.07)	0.08 (0.19)	0.06 (0.15)	0.04 (0.11)
Total Impacts on Natural Communities of Concern	**0.29 (0.71)**	**0.42 (1.03)**	**0.58 (1.42)**	**0.25 (0.63)**
Total Impacts on Waters of the U.S.	**0.06 (0.14)**	**0.08 (0.19)**	**0.10 (0.24)**	**0.04 (0.11)**

[a] Jurisdictional waters of the U.S., final acreages pending verification by the U.S. Army Corps of Engineers.
[b] Non-jurisdictional wetlands, final acreages pending verification by the U.S. Army Corps of Engineers.

S.3.2 Natural Communities of Special Concern and Native Trees

The study area supports five natural communities of special concern: Central Coast arroyo willow riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage. These communities support both native and non-native tree species. The proposed project would result in permanent loss and temporary disturbance of natural communities of special concern (Table S-1). Implementation of avoidance and minimization efforts described in this report would avoid and minimize potential impacts on these communities.

S.3.3 Sensitive Plant and Animal Species

The following conclusions have been reached regarding sensitive plant and animal species in the study area and potential project-related impacts.

- Botanical surveys concluded that sensitive plant species are not present in the study area; therefore the proposed project is not expected to affect sensitive plants.
- Two individual California red-legged frogs (CRLF) were observed during protocol-level surveys in the raceways at the wastewater treatment plant adjacent to the project area. No CRLFs were found in San Luis Obispo, Prefumo, or Froom Creeks during the surveys. These creeks do not provide suitable breeding habitat within the project area; however, riparian corridors associated with San Luis Obispo and Prefumo Creeks could provide potential foraging habitat, summer habitat, and dispersal corridors. The proposed project may adversely affect CRLF foraging, summer, or dispersal activities during construction efforts like dewatering or diversion, vegetation clearing, and heavy equipment use in riparian habitat.
- Prefumo and San Luis Obispo Creeks in the study area provide suitable aquatic habitat for foothill yellow-legged frog, southwestern pond turtle and two-striped garter snake. There is a potential for these species to become entrapped in areas being dewatered during installation of diversion structures within Prefumo and San Luis Obispo Creeks in the construction work area.

- Non-developed portions of the study area provide potential tree-, shrub-, and ground- nesting habitat for Cooper's hawk, northern harrier, white-tailed kite, western burrowing owl, and other migratory birds and raptors. Vegetation removal, ground-disturbance, and noise associated with construction activities could result in the disturbance of nesting migratory birds and raptors if active nests are present within or near the permanent or temporary construction impact area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. Such disturbance would violate California Fish and Game Code Sections 3503 (bird nests), 3503.5 (raptor nests), 3511 (fully protected birds), 3513 (migratory birds), and the Migratory Bird Treaty Act (MBTA).
- Concrete bridges and culvert structures in the study area provide potential habitat for nesting swallows. Modifications to the existing bridges and box culverts in the study area could result in the direct loss of active swallow nests. The proposed project will incorporate the installation of exclusion netting on the underside of bridges or culverts to prevent swallows from nesting.
- Existing bridges and culverts in the study area did not exhibit evidence of bat presence (guano, urine staining, odor, vocalizations). No crevices suitable for bat roosting were observed during the 2006 reconnaissance-level field surveys. The proposed project is not expected to affect roosting bats.
- San Luis Obispo and Prefumo Creeks in the study area are known to support south-central California coast steelhead. No changes to Froom Creek would occur as part of the proposed project and effects on steelhead there would be avoided. The removal of riparian vegetation along San Luis Obispo and Prefumo Creeks is likely to adversely affect rearing habitat for juvenile steelhead by reducing cover and shade. However, these affects largely would be temporary until planted vegetation becomes established in the affected areas. A compensatory mitigation measure to replace riparian vegetation, including shaded riverine aquatic (SRA) cover vegetation, at a 2:1 ratio or other ratio determined by the resource agencies will be executed. Additionally, removal of non-native plants in the study area and subsequent planting of native riparian vegetation will increase habitat values in affected areas. Changes in water temperature, channel morphology and hydrology could occur due to inchannel activities. However, no measurable changes to water temperature are anticipated because the amount of existing shade that would be affected would be small, shade impacts would be temporary, and the additional shade created by bridge widening would offset, in part, shade loss associated with riparian vegetation and SRA cover removal. Disturbance, injury, and mortality of individual fish could occur from work in and adjacent to water bodies, from fish salvage and relocation activities, and from pile driving. In addition, incidental take of steelhead could occur during dewatering of the stream channel to isolate work areas for bridge pier construction and during pile driving. However, the action is expected to have a minimal long-term effect on the stream or fish habitat, including spawning, rearing, or migratory habitat. Various measures have been identified to avoid and reduce potential effects on listed species and critical habitat.
- The proposed extension of the arch culvert on San Luis Obispo Creek at the LOVR stream crossing would avoid the potential for creating an impediment to fish passage because the natural channel bottom would be maintained and the oversized culvert would avoid or minimize the potential to create adverse hydraulic characteristics at this stream crossing

relative to existing conditions. Double 84-inch reinforced concrete pipe will be added above the existing 18-by-8-foot concrete box culvert on Prefumo Creek. The proposed culvert will be aligned parallel to the creek flow direction and its length will be 165 feet. The extra capacity of the concrete pipe will be used during high flows. The new concrete pipe will allow high flows to pass under US-101 and not affect the existing culvert. The existing fish ladder in the culvert under US-101 will not be affected and fish migration will not be affected relative to existing conditions.

S.3.4 Invasive Plants

Thirty-nine invasive plant species were documented in the study area. Of these, seven species are on the California Department of Food and Agriculture (CDFA) noxious weed list and are subject to Executive Order 13112 (Prevention and Control of Invasive Species). Construction activities have the potential to further spread these species in and beyond the study area. Mitigation measures have been recommended to avoid and minimize the introduction and spread of invasive species.

S.4 Permit Requirements

The following approvals and permits will be obtained prior to project construction:

- Clean Water Act (CWA) Section 404 nationwide permit from the U.S. Army Corps of Engineers (Corps)—Nationwide 14 (linear transportation) and 33 (temporary access and dewatering)
- CWA Section 401 water quality certification from the Regional Water Quality Control Board
- California Fish and Game Code Section 1602 streambed alteration agreement from the California Department of Fish and Game
- CWA Section 402/National Pollutant Discharge Elimination System permit from the State Water Resources Control Board
- Biological Opinion from NOAA Fisheries for potential adverse affects on south-central California Coast steelhead
- Biological Opinion from USFWS for potential adverse affects on CRLF

S.5 Avoidance and Minimization Measures

As part of the proposed project, the construction contractor will implement the following (abbreviated) avoidance and minimization measures, which are identified and described in Chapter 4. These measures have been identified based on natural resources identified as present or having the potential to occur in the study area and the potential impacts that could occur as a result of the proposed project:

- Measure BIO-1: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources to Be Avoided

- Measure BIO-2: Avoid and Minimize Potential Indirect Disturbance of Riparian Forest Communities
- Measure BIO-3: Replace Temporarily and Permanently Impacted Riparian Forest Vegetation
- Measure BIO-4: Avoid and Minimize Potential Indirect Disturbance of Seasonal Wetlands near the Construction Area
- Measure BIO-5: Protect Water Quality and Prevent Erosion in Wetlands and Drainages
- Measure BIO-6: Compensate for the Permanent Loss of Seasonal Wetlands
- Measure BIO-7: Avoid and Minimize Potential Indirect Disturbance of Freshwater Marsh near the Construction Area
- Measure BIO-8: Avoid and Minimize Potential Indirect Disturbance of Seasonal Drainage near the Construction Area
- Measure BIO-9 Compensate for Permanent Loss of Seasonal Drainage Habitat
- Measure BIO-10: Avoid and Minimize Potential Indirect Disturbance of Perennial Drainage near the Construction Area
- Measure BIO-11: Compensate for Permanent Loss and Temporary Disturbance of Perennial Drainage Habitat
- Measure BIO-12: Install Fencing and Monitor Dewatering Activities within the Construction Work Area and Relocate Sensitive Wildlife, if Necessary
- Measure BIO-13: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
- Measure BIO-14: Conduct a Preconstruction Survey for Burrowing Owl in Accordance with the California Department of Fish and Game Guidelines and Establish a No-Disturbance Buffer, if Necessary
- Measure BIO-15: Compensate for the Loss of Burrowing Owl Habitat in Accordance with DFG Guidelines
- Measure BIO-16: Conduct a Preconstruction Nesting Swallow Survey and Install Exclusion Netting on the Underside of Bridges or Culverts to Prevent Swallows from Nesting
- Measure BIO-17: Limit In-Channel Construction Activities to the Low-Precipitation Period
- Measure BIO-18: Implement Water Quality Measures
- Measure BIO-19: Implement Stream Diversion Restrictions
- Measure BIO-20: Avoid Stranding Impacts to Fish in Dewatered Areas
- Measure BIO-21: Avoid and Minimize Impacts to Spawning Habitat
- Measure BIO-22: Minimize Noise Impacts from Pile Driving
- Measure BIO-23: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization

- Measure BIO-24: Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks
- Measure BIO-25: Avoid the Introduction and Spread of Invasive Plants

Chapter 1 Introduction

This natural environment study (NES) report was prepared for the Los Osos Valley Road/U.S. 101 Interchange Project (proposed project). The City of San Luis Obispo (City) is proposing to improve the Los Osos Valley Road (LOVR)/U.S. 101 interchange and LOVR in the City and County of San Luis Obispo through the year 2030. These improvements are in addition to operational improvements currently planned or under construction by Caltrans, the City and the County. The project location map is provided as Figure 1-1.

This report is intended to support the preparation of National Environmental Policy Act (NEPA) documentation for Caltrans, the NEPA lead agency, and preparation of California Environmental Quality Act (CEQA) documentation for the City of San Luis Obispo, the CEQA lead agency. The City is proposing to use federal funding from the Federal Highway Administration to fund a portion of this project. This report also supports efforts to obtain agreements, permits, and concurrence needed to construct the proposed project.

1.1 Project History

The proposed project is located in the City of San Luis Obispo, San Luis Obispo County on U.S. 101 at the LOVR Interchange (Figure 1-1). Within the limits of the proposed project, U.S. 101 is a four-lane freeway with 3.6-meter (12-foot) lanes, 2.4-meter (8-foot) right shoulders, and a median width of 12.2 meters (40 feet). The original two-lane roadway was built in 1933 and was replaced with a four-lane facility in 1954. The functional classification of this segment of U.S. 101 is a Principal Arterial and is included in the National Highway System. U.S. 101 is also a State Highway Extra Legal Load (SHELL) route and an oversize truck route. Commuter traffic is the primary use through this portion of U.S. 101, but a large percentage of travel through the study area is interregional. The Transportation Concept Report (TCR), dated 2001, recommends that U.S. 101 be expanded to a six-lane freeway through this segment. However, widening of U.S. 101 is not part of this project.

The existing U.S. 101/LOVR interchange is configured as a diamond interchange except that a loop ramp in the southeast quadrant of the interchange provides access from LOVR to northbound U.S. 101. The LOVR overcrossing (No. 49-0185) was built in 1962 to carry two lanes of traffic. The bridge was widened in 1987 to carry four lanes of traffic. The existing bridge is a four-span structure of approximately 91.6 meters (300.5 feet) in length and 16.8 meters (55 feet) in width. Roadway embankments up to 6 meters (20 feet) in height were constructed for the overcrossing. Southeast of the interchange, within the project limit, LOVR passes over San Luis Obispo Creek. The on-ramp to southbound U.S. 101 is accessed from Calle Joaquin-South and not directly from LOVR. The southbound U.S. 101 off-ramp intersects LOVR at the LOVR/Calle Joaquin-South intersection. Calle Joaquin-North intersects LOVR approximately 91 meters (300 feet) to the west of the southbound U.S. 101 off-ramp/Calle Joaquin-South intersection.

1.2 Purpose and Need

The purpose of the proposed project is to improve traffic operations and safety on LOVR and the LOVR/U.S. 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to be designed such that it will not preclude the planned ultimate widening of U.S. 101 or future interchange improvements.

1.3 Project Description

The project limits extend along LOVR between Auto Park Way to the west and South Higuera Street to the east and along U.S. 101 for approximately 762 meters (2,500 feet) south and 1,500 meters (4,300 feet) north of the LOVR overcrossing, covering a distance of 0.84 km (0.52 miles). This section describes the proposed action and the design alternatives that were developed by a multi-disciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts.

The proposed project will provide a wider Los Osos Valley Road Overcrossing and an adjacent bridge crossing San Luis Obispo Creek, and the possible relocation and reconfiguration of the freeway ramps depending on the alternative chosen. This project is intended to accommodate current and future travel demands. Calle Joaquin Road south of LOVR has been recently realigned such that the existing “T” intersection of LOVR and Calle Joaquin Road north of LOVR has been converted to a four-legged intersection. The Calle Joaquin Road realignment was developed by the Costco Wholesale Corporation as a condition of approval and mitigation measure for traffic impacts. The two build alternatives selected to be studied as a part of this project are summarized below.

Under both build alternatives, the San Luis Obispo Creek Arch Culvert will be modified. The existing three-barrel structural steel plate arch culvert is a large and modern (1986) structure, carrying LOVR over San Luis Obispo Creek. This project would widen and raise the roadway. These roadway revisions require lengthening the culvert with a new structural steel arch (matching the existing), as well as increasing the loading on the existing culvert that is to remain. To determine the feasibility of this increased loading, a structural analysis was conducted. The analysis showed that the existing culvert can easily carry the additional loading placed on it. Therefore, lengthening the culvert is a viable option.

1.3.1 Staging and Access Areas

Access to the construction site would occur along existing paved roadways and would be limited to the designated permanent and temporary impact areas for Alternatives 3 and 6. Three staging areas have been proposed and are included in the study area (described in Chapter 3).

1.3.2 Project Schedule

The project is planned for construction in 2010.

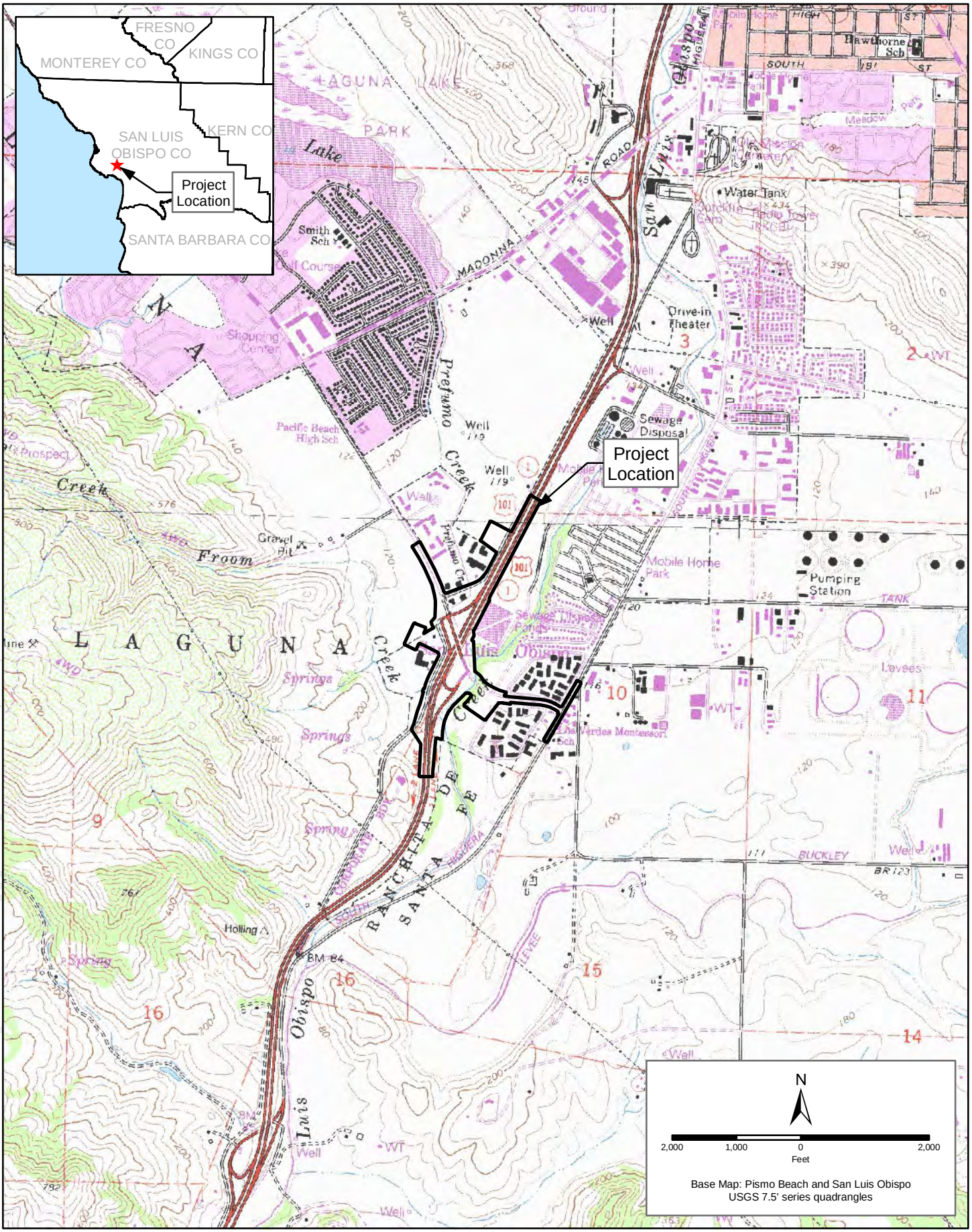


Figure 1-1
Project Location

1.4 Alternatives Considered

Two viable build alternatives (Alternative 3 and Alternative 6) for the proposed improvements have been identified by the Project Development Team (PDT) that satisfy the purpose and need for this project. The estimated construction cost of these alternatives ranges from $11 to $24 million. The major difference between the two build alternatives relates to the method used to provide additional travel lanes on Los Osos Valley Road on the Route 101 overcrossing. Alternative 3 would use the existing structure to carry the westbound lanes and would construct a separate but adjacent overcrossing structure to carry the eastbound lanes. Alternative 6 would replace the existing structure with a new, wider structure that would accommodate both the westbound and eastbound lanes.. Alternative 3 and Alternative 6 are described below.

1.4.1 Alternative 3—Minimum Build

Alternative 3 is the minimum build alternative for this project and is the locally preferred alternative (Figure 1-2). This alternative proposes to widen Los Osos Valley Road between the recently constructed Calle Joaquin intersection with Los Osos Valley Road west of US 101 and the Los Verdes community east of US 101 to 4 lanes, including the existing Los Osos Valley Road Overcrossing structure, and San Luis Obispo Creek culvert crossing. The widening will be accomplished by constructing a separate structure to carry the two eastbound lanes over US 101. Los Osos Valley Road will be a split profile over US 101 to accommodate the westbound lanes on the existing overcrossing. The project will lengthen the San Luis Obispo Creek culvert crossing on the south side and construct a cantilevered sidewalk on the north side. These widening efforts will accommodate four 12 foot through-lanes, bike lanes, sidewalks (on both sides), and a median 5 to 16 feet in width, which will be used for left turn pockets where needed. The northbound US 101 off-ramp will be widened from the intersection with Los Osos Valley Road to 500 feet south. The southbound on-ramp will be reconstructed near the current location opposite the southbound off-ramp.

The actual work to be performed under this alternative includes:

- Widen Los Osos Valley Road from 2 to 4 lanes from South Higuera St. to 600 feet north of Calle Joaquin to meet existing 4 lane section west of Calle Joaquin.
- Extend existing San Luis Obispo Creek Culvert Crossing to accommodate widened Los Osos Valley Road.
- Construct retaining walls to avoid San Luis Obispo Creek impacts.
- Construct a separate US 101 Overcrossing to carry the 2 eastbound lanes with a split profile.
- Raise the intersection of Los Osos Valley Road/US 101 southbound ramps.
- Construct retaining walls to avoid Prefumo Creek and business impacts at LOVR/US-101 southbound ramps
- Construct sidewalks and Class II bike lanes along both sides of Los Osos Valley Road.
- Construct new street lighting along Los Osos Valley Road.

- Modify existing signals at Los Osos Valley Road/US 101 ramp intersections.
- Construct additional box culvert capacity under US 101 for Prefumo Creek.
- Raise headwalls on Prefumo Creek box culvert under southbound off-ramp to accommodate ramp raising and widening
- Increase the hydraulic capacity of San Luis Obispo Creek by removal of deposited sediment from the outer two bays of the of the San Luis Obispo Creek bridge to a level 3 feet above the bottom of the active channel to prevent spreading flow. No modification will be made to the active channel.
- Widen/reconstruct US 101 northbound off-ramp and construct retaining wall to avoid creek impacts.
- Widen US 101 southbound off-ramp and construct retaining walls.
- Modify storm drain system along Los Osos Valley Road to accommodate widening and profile revisions.
- Modify landscaping and sidewalks along Los Osos Valley Road at Los Verdes.
- Modify striping, medians, and lane widths along Los Osos Valley Road at Los Verdes.
- Restripe on South Higuera Street to optimize the capacity of the South Higuera Street/Los Osos Valley Road intersection given the widening of Los Osos Valley Road.
- Construct retention basin within the northbound loop on ramp.
- Construct native landscaping within the intersection.
- Construct standard acceleration lane from southbound on-ramp.

No modifications will be made to drainage structures at the on/off ramps at Froom Creek.

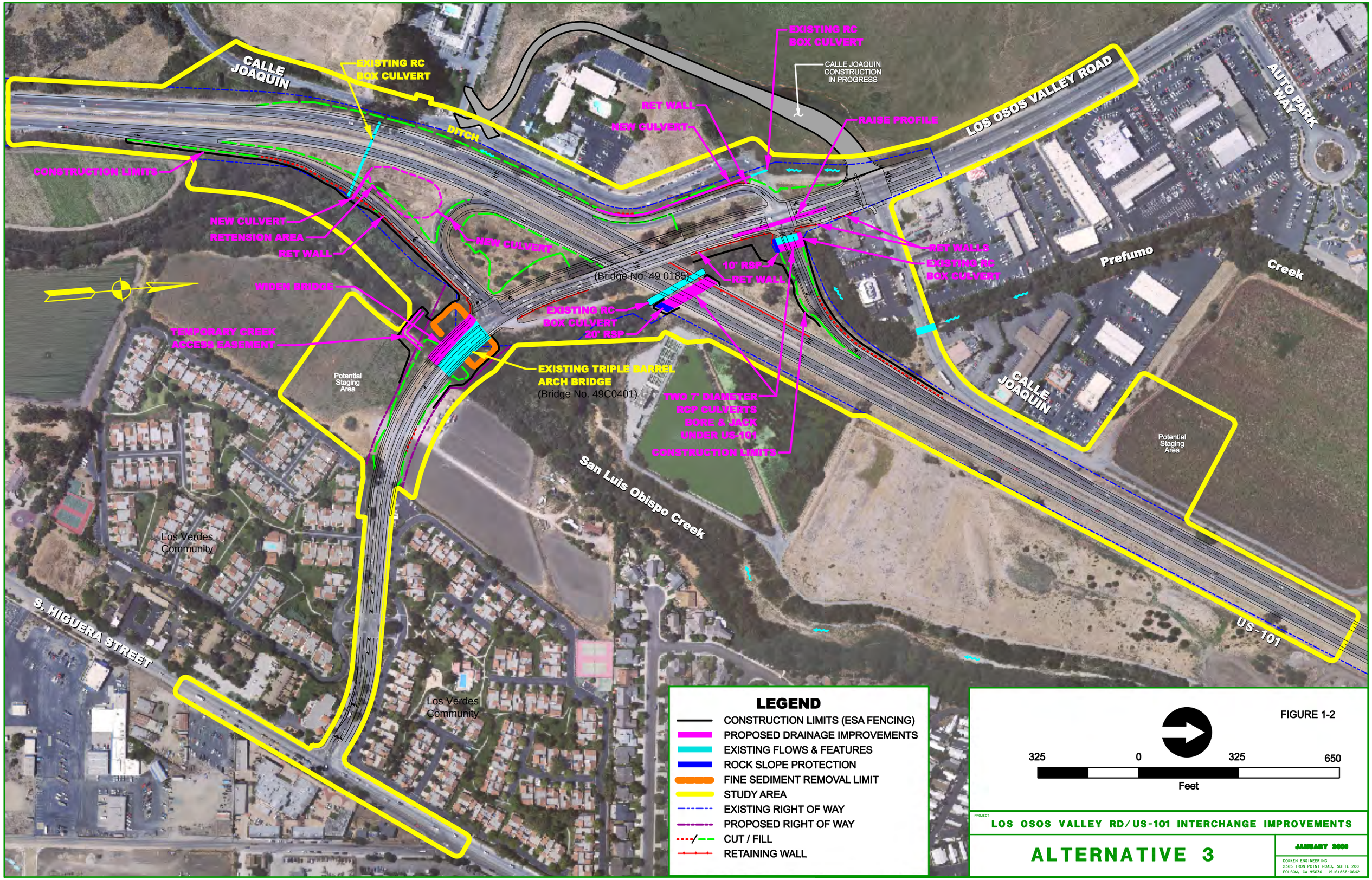
1.4.1.1 Mandatory Standards

Non-standard vertical clearance (HDM 309.2(1)(a) – The existing Los Osos Valley Road Overcrossing vertical clearance is 14 feet-10 inches. Current standards call for 16 feet-6 inches.

Non-standard intersection spacing (HDM 504.3(3)) – Intersection spacing between the Southbound on/off ramp intersection and the Calle Joaquin intersection on Los Osos Valley Road is 310 feet. Current standards call for 400 feet. *(this design exception was approved in 2006 as part of the Calle Joaquin relocation project)*

Non-standard deceleration length (HDM 504.2) – The existing southbound off-ramp to Los Osos Valley Road includes a radius of 400 feet and provides a deceleration length of 302 feet. Current standards call for 470 feet.

Non-standard design speed (HDM 101.1) – The LOVR profile at the southbound ramp intersection provides a 30 mph design speed. Current standards call for a 35 mph design speed.


CALLE JOAQUIN
EXISTING RC BOX CULVERT
DITCH
CONSTRUCTION LIMITS
NEW CULVERT
RETENSION AREA
RET WALL
NEW CULVERT
WIDEN BRIDGE
TEMPORARY CREEK ACCESS EASEMENT
Potential Staging Area
Los Verdes Community
S. HIGUERA STREET
Los Verdes Community
(Bridge No. 49 0185)
EXISTING RC BOX CULVERT
20' RSP
EXISTING TRIPLE BARREL ARCH BRIDGE
(Bridge No. 49C0401)
TWO 7' DIAMETER RCP CULVERTS BORE & JACK UNDER US-101
CONSTRUCTION LIMITS
San Luis Obispo Creek
RET WALL
NEW CULVERT
EXISTING RC BOX CULVERT
CALLE JOAQUIN CONSTRUCTION IN PROGRESS
RAISE PROFILE
10' RSP
RET WALL
RET WALLS
EXISTING RC BOX CULVERT
LOS OSOS VALLEY ROAD
AUTO PARK WAY
Prefumo
Creek
CALLE JOAQUIN
Potential Staging Area
US-101
LEGEND
CONSTRUCTION LIMITS (ESA FENCING)
PROPOSED DRAINAGE IMPROVEMENTS
EXISTING FLOWS & FEATURES
ROCK SLOPE PROTECTION
FINE SEDIMENT REMOVAL LIMIT
STUDY AREA
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
CUT / FILL
RETAINING WALL
FIGURE 1-2
325 0 325 650
Feet
PROJECT
LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 3
JANUARY 2008
DOKKEN ENGINEERING
2365 IRON POINT ROAD, SUITE 200
FOLSOM, CA 95630 (916)858-0642

Non-standard side slopes (HDM 304.1) – Side slope grading along the northbound off-ramp and southbound off-ramp is proposed to be 2:1. Current standards call for 4:1 slopes.

1.4.1.2 Advisory Standards

No exceptions are required to the advisory design standards.

1.4.2 Alternative 6—Moderate Build, Near Full Standard

This alternative proposes to widen Los Osos Valley Road between Calle Joaquin west and the Los Verdes Communities east of US 101 (Figure 1-3). The existing Los Osos Valley Road OC will be replaced to improve the profile, vertical clearance and space required for the southbound hook off-ramp. The existing northbound loop on-ramp to US 101 will be reconstructed and the northbound off-ramp will be widened. A new northbound diagonal on-ramp to US 101 may be added in the NE quadrant of the interchange as a phased improvement. An auxiliary lane will be added to northbound US 101 beginning at the terminus of the northbound loop on-ramp and ending 1000 feet beyond the terminus of the northbound diagonal on-ramp. The northbound diagonal on-ramp would be supported by retaining walls and an additional bridge over Prefumo Creek. The existing southbound on- and off- ramps from US 101 will be removed. South of Los Osos Valley Road, new southbound on- and off-ramps from US 101 would be constructed in a hook ramp configuration. Calle Joaquin south of Los Osos Valley Road is being realigned to accommodate the realigned southbound US 101 ramps and to create a four-leg intersection with Calle Joaquin north of Los Osos Valley Road.

The actual work to be performed under this alternative includes:

- Widen Los Osos Valley Road to 4 lanes from South Higuera St. to 600 feet north of Calle Joaquin.
- Extend or reconstruct existing San Luis Obispo Creek Culvert Crossing to accommodate widened Los Osos Valley Road.
- Increase the hydraulic capacity of San Luis Obispo Creek by removal of deposited sediment from the outer two bays of the of the San Luis Obispo Creek bridge to a level 3 feet above the bottom of the active channel to prevent spreading flow. No modification will be made to the active channel.
- Replace the Los Osos Valley Road US 101 Overcrossing with a new 4 lane overcrossing.
- Relocate and reconstruct the southbound US 101 ramps.
- Construct retaining walls to avoid Prefumo Creek and business impacts at LOVR/old US-101 southbound ramps
- Reconstruct northbound US 101 loop on-ramp.
- Construct northbound US 101 diagonal on-ramp and merge lane to US 101.
- Construct northbound US 101 on-ramp bridge & retaining walls at Prefumo Creek.
- Construct stop controlled intersection of US 101 southbound ramps and Calle Joaquin.

- Construct sidewalks and combined bike lane/shoulder along Los Osos Valley Road.
- Construct new street lighting along Los Osos Valley Road and Calle Joaquin.
- Modify existing signals at Los Osos Valley Road/US 101 northbound off-ramp intersection.
- Construct additional box culvert capacity under US-101 for Prefumo Creek.
- Remove existing southbound US 101 ramps and Prefumo Creek Box Culvert.
- Widen/Reconstruct US 101 northbound off-ramp and construct retaining wall.
- Extend the Prefumo Creek box culvert under US 101 for new southbound off ramp.
- Construct storm drain systems for Los Osos Valley Road and reconstruct ramps.
- Modify landscaping and sidewalks along Los Osos Valley Road at Los Verdes.
- Modify striping, medians, and lane widths along Los Osos Valley Road at Los Verdes.
- Restripe South Higuera Street to optimize the capacity of the South Higuera Street/Los Osos Valley Road intersection given the widening of Los Osos Valley Road.
- Construct retention basin within the northbound loop on ramp.
- Construct native landscaping within the intersection.

1.4.2.1 Mandatory Standards

No exceptions are required to the mandatory design standards.

1.4.2.2 Advisory Standards

No exceptions are required to the advisory design standards.

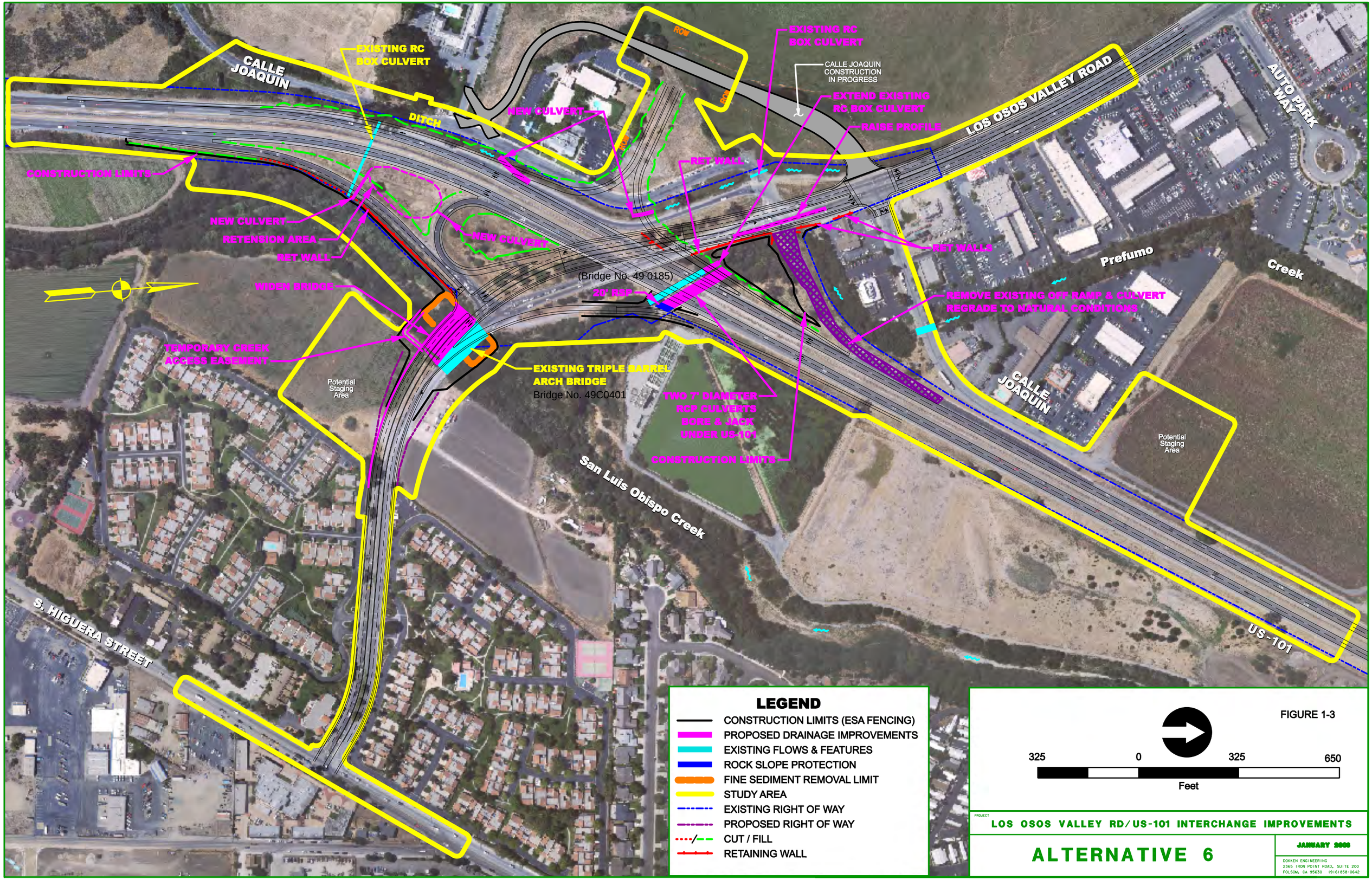
1.4.3 Design Minimization Measures Common to Both Alternatives

Alignment adjustments

- Northbound off-ramp moved west toward US 101 away from San Luis Obispo Creek ensuring trees will not be removed in this area and work can be conducted from existing roadway.
- Moving this off-ramp also avoids impacts to the Froom Creek outfall. The Froom Creek outfall will not be modified.

Retaining walls and embankment configurations

- A retaining wall on northbound off-ramp will limit impacts to San Luis Obispo Creek.
- A retaining wall on southbound off-ramp will limit impacts to Prefumo Creek.
- Steeper 2:1 side slopes are proposed along the northbound off-ramp and southbound off-ramp. Current standards call for 4:1 slopes but the steeper 2:1 gradients further restrict the


CALLE JOAQUIN
EXISTING RC BOX CULVERT
DITCH
NEW CULVERT
ROW
EXISTING RC BOX CULVERT
CALLE JOAQUIN CONSTRUCTION IN PROGRESS
EXTEND EXISTING RC BOX CULVERT
RAISE PROFILE
LOS OSOS VALLEY ROAD
AUTO PARK WAY
CONSTRUCTION LIMITS
RET WALL
NEW CULVERT
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RET WALL
NEW CULVERT
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Creek
REMOVE EXISTING OFF RAMP & CULVERT
REGRADE TO NATURAL CONDITIONS
TEMPORARY CREEK ACCESS EASEMENT
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TWO 7' DIAMETER RCP CULVERTS BORE & JACK UNDER US-101
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S. HIGUERA STREET
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ROCK SLOPE PROTECTION
FINE SEDIMENT REMOVAL LIMIT
STUDY AREA
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
CUT / FILL
RETAINING WALL
FIGURE 1-3
325
0
325
650
Feet
PROJECT
LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 6
JANUARY 2006
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horizontal extent of the road embankment that would encroach into San Luis Obispo Creek and Prefumo Creek.

In-stream modifications

- If disturbance to the gravel cannot be avoided in San Luis Obispo Creek, the gravel will be removed temporarily and replaced to the extent practicable with gravel removed from the site. Before returning gravels to the channel following construction, gravels will be washed to remove fines before they are placed back into the creek channel. If it becomes necessary to augment disturbed gravels with gravel from outside sources, only washed river gravel (to remove fines) appropriately sized for adult steelhead will be used. To correct unnatural drainage patterns, approximately 60.96 meters (200 feet) downstream of the LOVR bridge, the project will include removal of fine sediments and replacement of them with appropriately-sized spawning gravels.
- Where rock slope protection (RSP) is needed, native riparian vegetation and/or large woody material will be incorporated in the RSP to the extent practicable.
- In order to reduce gaps in the post-construction canopy (i.e., shade), the design restricts extensions of streambank RSP or other bank protection (e.g., sheet piles or bank and channel armoring) to the minimum necessary to protect essential infrastructure.
- Permanent fish passage will be maintained or improved at each structure that requires modification.

  A. Along Prefumo Creek fish passage will be maintained by extending the structure on the RSP on the outfall.

  B. Along San Luis Obispo Creek fish passage will not be impeded by the RSP on the banks.

  C. No work proposed in Froom Creek.

Replanting and final grading

- The two seasonal wetlands, located in the artificially created basins between U.S. 101 and existing northbound on- and off-ramps, will be restored onsite as a retention basin after the new ramps are constructed. These features appear to be unconnected to any of the creeks in the area, and are likely to be considered non-jurisdictional by the Corps. To ensure sufficient ponding in support of wetland vegetation, the basin will be excavated to pre-project conditions and planted with a native seed mix.
- All disturbed areas will be seeded with native mixes and mulched with certified weed-free mulch (rice straw may be used in upland areas). Native, non-invasive species will be used in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.

1.4.3.1 Additional Minimization Measures: Alternative 3

Retaining walls and embankment configurations

- A retaining wall will be built along the southbound on ramp restricting fills into a portion of Drainage Ditch #2.
- A retaining wall will be built along westbound LOVR between US 101 and the south southbound off-ramp and will also restrict impacts to Prefumo Creek.

1.4.3.2 Additional Minimization Measures: Alternative 6

Retaining wall

- The northbound diagonal on-ramp will use retaining walls and free-spans over Prefumo Creek.

Chapter 2 Study Methods

2.1 Studies Required

Potential biological resource issues associated with the proposed project were identified through agency coordination, review of existing information, and field surveys. After agencies were contacted and existing information reviewed, it was determined that the following studies would be required to document natural resources in the study area:

- delineation of waters of the United States, including wetlands (Appendix A);
- botanical field survey to identify plant communities, protected trees, occurrences of sensitive plant species, and noxious weed infestations;
- general habitat evaluation to determine whether suitable habitat exists for sensitive animal species;
- biological assessment (BA) for potential project impacts on sensitive anadromous fish species (Appendix B); and
- site assessment, protocol-level surveys, and BA for California red-legged frog (CRLF) (Appendix F).

The methods used to identify natural resources in the study area comprised a prefield investigation, field surveys, and coordination with the resource agencies. Each element is described below.

2.1.1 Prefield Investigation

To prepare for the field surveys, biologists reviewed existing resource information related to the proposed project to evaluate whether sensitive species or other sensitive biological resources (e.g., wetlands) could occur in the study area. The sources listed below were reviewed:

- California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Plants of California (2006);
- California Natural Diversity Database (CNDDB) records search for the Pismo Beach, Port San Luis, Morro Bay South, San Luis Obispo, Lopez Mountain, and Arroyo Grande NE U.S. Geological Survey (USGS) 7.5-minute quadrangles (2006) (Appendix C);
- list of sensitive species provided by U.S. Fish and Wildlife Service (USFWS) (Appendix D);
- California list of noxious weed species (California Department of Food and Agriculture 2004) and invasive plant inventory (California Invasive Plant Council 2006);
- *Soil Survey of San Luis Obispo County, California, Coastal Part* (Ernstrom 1984);

- *Wetland Assessment, Froom Ranch, San Luis Obispo County, California* (The Morro Group, Inc. 2005);
- *Comprehensive Fairy Shrimp Wet and dry Survey Report, Unocal Corporation San Luis Obispo Tank Farm* (Rincon Consultants, Inc. 2005);
- *Wetland Assessment, Calle Joaquin Realignment Project, San Luis Obispo County, California* (The Morro Group, Inc. 2004a);
- *Biological Assessment, Calle Joaquin Realignment Project, San Luis Obispo County, California* (The Morro Group, Inc. 2004b);
- *Preliminary Environmental Analysis Report, Los Osos Valley Road/Route 101 Interchange, San Luis Obispo, CA* (The Morro Group, Inc. 2003a);
- *California Red-Legged Frog Survey Report, Calle Joaquin Realignment Project* (The Morro Group, Inc. 2003a);
- *Final Environmental Impact Report, Madonna General Plan Amendment* (The Morro Group, Inc. 1989); and
- *Biological Survey of the Froom Ranch Project Site, San Luis Obispo County, California* (Holland et. al. 1988).

This information was used to develop lists of sensitive species and other sensitive biological resources that could be present in the project region. Species from the lists were considered if they were known to occur in the project region (i.e., within a 16.1-kilometer [10-mile] radius of the study area) or if suitable habitat for the species was present in the study area.

2.2 Personnel and Survey Dates

Biological surveys were conducted between February and July 2006 by Jones & Stokes biologists and between May and August by personnel from LSA Associates (Table 2-1). Methods and personnel involved with documenting waters of the United States and botanical, wildlife, and fisheries resources are described below.

Table 2-1. Biological Resource Survey Dates

Survey Date	Survey Purpose
February 24, 2006	Reconnaissance-level field survey
April 4, 2006	Field survey with Caltrans and City to evaluate aquatic habitats
May 10 and 11, 2006	Wildlife habitat assessment and botanical surveys
July 18–19, 2006	Botanical surveys, fisheries habitat evaluation, delineation of waters of the U.S.
May 30 and June 7, 2006	Site assessment for California red-legged frog (*Rana aurora draytonii*)
June 8, 14–15, 20–23, 25–26, and 28–29; and July 25–26 and 28; and August 3 and 9–10, 2006	Protocol survey for California red-legged frog

2.2.1 Waters of the United States

Jones & Stokes wetland ecologist Lisa Webber conducted a delineation of waters of the United States in the study area. Ms. Webber has a Masters of Science in botany and 16 years of experience as a botanist. She also completed the U.S. Army Corps of Engineers Wetland Delineation Certification Program.

The delineation report (Appendix A) contains a complete discussion of the methods used to delineate waters of the United States, including wetlands. Wetlands were delineated using the routine onsite determination method outlined in the Corps' Wetlands Delineation Manual (Environmental Laboratory 1987). Using this method, wetlands are delineated by identifying the presence of three characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. The jurisdictional boundaries for other waters of the United States were identified based on the presence of an OHWM, as defined in 33 CFR 328.3(e). Data were obtained from wetlands, other waters of the United States, and adjacent upland habitats to delineate the jurisdictional boundary between wetlands and uplands.

2.2.2 Botanical Resources

Ms. Webber conducted botanical surveys in the study area during the appropriate flowering periods for early- and late-blooming sensitive plants with potential to occur in the study area. A list of plant species encountered during the field visit is included in Appendix E. Vegetation communities in the study area were also identified and mapped during the botanical and wetland field surveys. All plants were identified in the field or collected for identification using the Jepson manual (Hickman 1993). Results of these surveys are presented in Chapters 3 and 4.

2.2.3 Wildlife Resources

Jones and Stokes wildlife biologist Angela Alcala conducted a habitat evaluation for sensitive wildlife species within the study area. Ms. Alcala has a Bachelors of Science in Wildlife, Fisheries, and Conservation Biology and five years of experience as a wildlife biologist.

Field surveys focused on identifying and evaluating biological communities in the study area and determining their suitability for sensitive and common wildlife species. Ms. Alcala also conducted a visual survey of the undersides of the existing bridge structures to determine whether the bridges could support nesting swallows or roosting bats. A list of wildlife species observed in the study area is provided in Appendix E.

Protocol-level surveys for CRLF (*Rana aurora draytonii*) were conducted within the study area and one mile up and downstream from the study area by LSA Associates in June, July, and August 2006 (see Table 2-1 for specific dates). Results of those surveys are provided in Chapter 3.

2.2.4 Fisheries Resources

No special-status fish surveys were required for the proposed project. Based on existing fisheries information for San Luis Obispo, Prefumo, and Froom Creeks, one special-status fish species, south-central California coast steelhead (*Oncorhynchus mykiss*), is known to be present in the study area based on previous investigations in the project area (Payne and Associates 2004).

2.3 Regulatory Requirements

This section describes the federal, state, and local plans, policies, and laws that are relevant to biological resources in the study area. A list of applicable federal permits and approvals that could be required before construction of the proposed project is provided in Chapter 5.

2.3.1 Federal Regulations

The National Environmental Policy Act (NEPA), federal Endangered Species Act (ESA), Clean Water Act (CWA), and Executive Orders (EOs) 13112 and 13186 are applicable to the proposed project and are described below.

2.3.1.1 National Environmental Policy Act

NEPA provides an interdisciplinary framework for environmental planning by federal agencies and contains action-forcing procedures to ensure that federal agency decision makers take environmental factors into account. NEPA applies whenever a federal agency proposes an action, grants a permit, or agrees to fund or otherwise authorize any other entity to undertake an action that could possibly affect environmental resources. Caltrans is acting as federal lead agency for this project.

2.3.1.2 Endangered Species Act

ESA protects fish and wildlife species and their habitats that have been identified by the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NOAA Fisheries) as threatened or endangered. Endangered refers to species, subspecies, or distinct population segments (DPS) that are in danger of extinction through all or a significant portion of their range, and threatened refers to those that are likely to become endangered in the near future. ESA is administered by USFWS and NOAA Fisheries. In general, NOAA Fisheries is responsible for protection of ESA-listed marine species and anadromous fishes, while other listed species are under USFWS jurisdiction. Provisions of ESA Sections 7 and 9 are relevant to this project and summarized below.

Section 7: Authorization Process for Federal Actions

ESA Section 7 provides a means for authorizing take of threatened and endangered species by federal agencies. Under Section 7, the federal agency that is conducting, funding, or permitting an action (i.e., the lead federal agency) must consult with USFWS or NOAA Fisheries as appropriate to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a proposed project may affect a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment (BA) that evaluates the nature and severity of the expected effect. In response, USFWS or NOAA Fisheries will issue a biological opinion (BO) with a determination that the proposed action either:

- may jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding), or

- will not jeopardize the continued existence of any listed species (no jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The BO may stipulate discretionary reasonable and prudent conservation measures. If the project would not jeopardize a listed species, USFWS or NOAA Fisheries will issue an incidental take statement to authorize the proposed activity.

To comply with Section 7 (16 United States Code [USC] 1536), FHWA and Caltrans will initiate formal consultation with NOAA Fisheries for potential impacts on south-central California coast steelhead and with USFWS for potential impacts on CRLF. A fisheries BA has been prepared for the proposed project and is provided in Appendix B. The BA for CRLF is contained in Appendix F.

Section 9: Prohibitions

ESA Section 9 prohibits the take of any fish or wildlife species listed under ESA as endangered. Take of threatened species also is prohibited under Section 9 unless otherwise authorized by federal regulations.[1] Take, as defined by ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification." In addition, Section 9 prohibits removing, digging up, cutting, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction.

2.3.1.3 Clean Water Act

CWA was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. CWA empowers the U.S. Environmental Protection Agency (EPA) to set national water quality standards and effluent limitations, and includes programs addressing both point-source and non-point-source pollution. Point-source pollution originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site. Non-point-source pollution originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. CWA operates on the principle that all discharges into the nation's waters are unlawful unless they are specifically authorized by a permit; permit review is CWA's primary regulatory tool. The following sections provide additional details on specific sections of CWA (401, 402, 404).

Section 404: Permits for Fill Placement in Waters and Wetlands

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Waters of the United States refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any of the following:

[1] In some cases, exceptions may be made for threatened species under ESA Section 4[d]. In such cases, USFWS or NOAA Fisheries issues a "4[d] rule" that describes protections for the threatened species and specifies the circumstances under which take is allowed.

- areas within the ordinary high-water mark (OHWM) of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned; and
- seasonal and perennial wetlands, including coastal wetlands.

On January 9, 2001, the U.S. Supreme Court made a decision in S*olid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (121 S. Ct. 675 [2001]), generally referred to as "SWANCC," that affected U.S. Army Corps of Engineers (Corps) jurisdiction in isolated waters. Based on SWANCC, the Corps no longer has jurisdiction or regulates isolated wetlands (i.e., wetlands that have no hydrologic connection with waters of the United States).

Applicants must obtain a permit from the Corps for all discharges of dredged or fill material into waters of the United States, including adjacent wetlands, before proceeding with a proposed activity. The Corps may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. Nationwide permits (NWPs) are a type of general permit issued to cover particular fill activities. Each NWP specifies particular conditions that must be met for the NWP to apply to a particular project.

Compliance with Section 404 requires compliance with several other environmental laws and regulations. The Corps cannot issue an individual permit or verify the use of a general permit until the requirements of NEPA, ESA, and the National Historic Preservation Act (NHPA) have been met. In addition, the Corps cannot issue or verify any permit until a water quality certification or a waiver of certification has been issued pursuant to CWA Section 401.

Potential waters of the United States in the study area would be under the jurisdiction of the Corps' Los Angeles District. A wetland delineation has been prepared for the proposed project and discusses the amount of fill that would be placed into waters of the United States during construction of the proposed project (Appendix A). The City will apply for the appropriate NWPs, most likely NWP #14 (Linear Transportation Projects) and NWP #33 (Temporary Construction Impacts), from the Corps in compliance with Section 404.

Section 402: Permits for Stormwater Discharge

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by EPA. In California, the State Water Resources Control Board (State Water Board) is authorized by EPA to oversee the NPDES program through the Regional Water Quality Control Boards (RWQCBs) (see "Porter-Cologne Water Quality Control Act" below). NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent (NOI) to discharge stormwater and to prepare and implement a storm water pollution prevention plan (SWPPP). The SWPPP includes a site map, description of proposed construction activities, and best management practices (BMPs) that will be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to

ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

The project corridor and vicinity are under the jurisdiction of the Central Coast RWQCB in San Luis Obispo. As the proposed project will result in more than 1 acre of disturbed lands, the City will apply for an NPDES permit.

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality, including projects that require federal agency approval, such as issuance of a Section 404 permit, must also comply with Section 401.

The City will apply for water quality certification from the RWQCB.

2.3.1.4 Executive Order 13112: Prevention and Control of Invasive Species

EO 13112 (signed February 3, 1999) directs all federal agencies to prevent and control introductions of invasive species in a cost-effective and environmentally sound manner. The EO and directives from FHWA require consideration of invasive species in NEPA analyses, including their identification and distribution, their potential impacts, and measures to prevent or eradicate them. The discussion of noxious weeds in Chapter 4 describes project impacts related to invasive species and mitigation measures to avoid or minimize the spread of these species in the study area.

2.3.1.5 Executive Order 13186: Migratory Bird Treaty Act

EO 13186 (signed January 10, 2001) directs each federal agency taking actions that could adversely affect migratory bird populations to work with USFWS to develop a memorandum of understanding (MOU) that will promote the conservation of migratory bird populations. Protocols developed under the MOU will include the following agency responsibilities:

- avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- restore and enhance habitat of migratory birds, as practicable; and
- prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist federal agencies in their efforts to comply with the Migratory Bird Treat Act (MBTA) (50 Code of Federal Regulations [CFR] 10 and 21) and does not constitute any legal authorization to take migratory birds. Take is defined under the MBTA as “the action of or attempt to pursue, hunt, shoot, capture, collect, or kill” (50 CFR 10.12) and includes intentional take (i.e., take that is the purpose of the activity in question) and unintentional take (i.e., take that results from, but is not the purpose of, the activity in question). The discussion of

nesting migratory birds in Chapter 4 describes potential project impacts on migratory birds and mitigation measures to avoid impacts on these species.

2.3.2 State Regulations

The California Fish and Game Code (CFGC) are applicable to the proposed project and described below.

2.3.2.1 California Fish and Game Code

Several sections of CFGC apply to the proposed project and are described below: 1602, 3503, 3503.5, 3511, and 3513.

Section 1602: Streambed Alteration Agreements

Under CFGC 1602, public agencies are required to notify CDFG before undertaking any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFG is required to propose reasonable project changes to protect the resources. These modifications are formalized in a streambed alteration agreement (SAA) that becomes part of the plans, specifications, and bid documents for the project. The City will apply for an SAA for the proposed project.

Sections 3503 and 3503.5: Birds and Raptors

CFGC 3503 prohibits the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and destruction of raptor nests. Trees and shrubs may be present in and adjacent to the study area and could provide potential nesting habitat for birds and raptors. The City will avoid violation of CFGC 3503 and 3503.5 by implementing measures identified in Chapter 4 for migratory birds and raptors.

Section 3511: Fully Protected Birds

CFGC provides protection from take for a variety of species, referred to as fully protected species. CFGC 3511 lists fully protected birds and prohibits take of these species. The code defines take as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Except for take related to scientific research, all take of fully protected species is prohibited. One fully protected species, the white-tailed kite (*Elanus leucurus*), has the potential to occur in the study area. The City will avoid violation of CFGC 3511 by implementing measures identified in Chapter 4 for migratory birds and raptors.

Section 3513: Migratory Birds

CFGC 3513 prohibits the take or possession of any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. The City will avoid violation of CFGC 3513 by implementing measures identified in Chapter 4 for migratory birds and raptors.

2.3.3 Local Regulations

Chapter 12.24 of the San Luis Obispo Municipal Code includes tree regulations for the preservation of native and heritage trees within the City. The study area does not contain any of the heritage trees identified within the City, but does support many native trees within the riparian communities. The tree regulations require a permit for the removal of any tree in the City. The regulations additionally require that the City replace trees removed as part of a public improvement project as soon as feasible during the project. Based on requirements in the tree removal application, replacement trees must be planted within 45 days of the tree removal.

2.4 Agency Coordination and Professional Contacts

During preparation of this document, Jones & Stokes coordinated with the following federal, state, and local agencies.

2.4.1 Federal

Coordination for the project was conducted with USFWS. Coordination with NOAA Fisheries was not required for preparation of this NES.

2.4.1.1 U.S. Fish and Wildlife Service

February 20, 2006: Jones & Stokes obtained an unofficial list of all federal proposed and listed endangered and threatened species that could occur in the vicinity of the proposed project from the USFWS website (U.S. Fish and Wildlife Service 2006).

August 5, 2006: Jones & Stokes obtained an updated list of all federal proposed and listed endangered and threatened species that could occur in the vicinity of the proposed project from the USFWS website (U.S. Fish and Wildlife Service 2006). The list is presented in Appendix D.

2.4.2 State

Coordination for the project was conducted with Caltrans and the State Lands Commission.

2.4.2.1 California Department of Transportation

April 4, 2006. Jones & Stokes biologists conducted a site visit with Caltrans biologist Dave Hacker and City biologist Freddy Otte at San Luis Obispo Creek, Prefumo Creek, and two water treatment ponds in and adjacent to the study area. The purpose of the site visit was to evaluate aquatic habitat in the study area and its potential to support sensitive wildlife and fish species. Mr. Hacker indicated that Caltrans is comfortable assuming that no vernal pool fairy shrimp (*Branchinecta lynchi*) habitat would be affected by the proposed project. However, Mr. Hacker stated that Caltrans and FHWA would require protocol-level CRLF surveys to be conducted one mile up and downstream from the study area. During this meeting, the City biologist also indicated that Prefumo Creek and San Luis Obispo Creek in the study area does not support tidewater goby (*Eucyclogobius newberryi*) but does provide spawning and rearing habitat for south-central California coast steelhead (*Oncorhynchus mykiss*).

2.4.2.2 State Lands Commission

August 1, 2006: Jones & Stokes wetland ecologist, Lisa Webber, sent a request to Susan Young at the California State Lands Commission (CSLC) for a determination whether study area creekbeds are sovereign lands under CSLC jurisdiction and would require a land lease agreement for placement of bridge support structures in the creekbeds.

August 8, 2006: Ms. Young responded that San Luis Obispo Creek and Prefumo Creek and adjacent uplands at the project location are partially within Ranch Laguna and federally protected lands. Therefore, CSLC presently asserts no leasing interest in the project area.

2.5 Limitations That May Influence Results

No limitations that may influence results were identified during the field surveys.

Chapter 3 Results: Environmental Setting

3.1 Description of the Existing Biological and Physical Conditions

3.1.1 Biological Study Area

The biological study area (study area) includes portions of U.S. 101, LOVR, Calle Joaquin Road, and South Higuera Street and incorporates the limits of construction associated with Alternative 3 and Alternative 6 (shown on Figures 3-1a and 3-1b). Representative photos of the study area are provided as Figure 3-2a and Figure 3-2b. The study area occurs around the existing LOVR and U.S. 101 interchange. Land uses in the study area are primarily urban and agricultural.

3.1.2 Physical Conditions

The study area is within the outer South Coast Range geographic subdivision of the Central Western Region in the California Floristic Province (Hickman 1993). The study area is in San Luis Obispo County within the San Luis Obispo and Pismo Beach 7.5-minute U.S. Geological Survey (USGS) quadrangles. In the San Luis Obispo quadrangle, the study area is in both an unnamed section and Section 3, Township 31 south, Range 12 east. The portion of the study area located in the Pismo Beach quadrangle is in both an unnamed section and Section 10, Township 31 south, Range 12 east. Topography in the overall study area is fairly level. Elevations in the study area are approximately 30.5 meters (100 feet) to 36.6 meters (120 feet) above sea level.

According to the *Soil Survey of San Luis Obispo County, California, Coastal Part* (Ernstrom 1984), the study area is contained within five soil mapping units: Concepcion loam, 2–5% slopes, Cropley clay, 0–2% slopes, Los Osos-Diablo complex, 15–30% slopes, Salinas silty clay loam, 0–2% slopes, and Xererts-Xerolls-Urban land complex, 0–15% slopes. Soil conditions vary throughout the study area, and the soil profile has been disturbed by the construction of existing roads. Mapped information on soils is discussed in the delineation report (Appendix A).

The study area is within the Central Coastal hydrologic unit. Three major creeks cross the study area, Froom Creek, Prefumo Creek, and San Luis Obispo Creek. Froom Creek drains to San Luis Obispo Creek from the west, crossing under Calle Joaquin Road and U.S. 101 in an existing reinforced concrete box (RCB) culvert. Prefumo Creek drains to San Luis Obispo Creek immediately north of LOVR. San Luis Obispo Creek drains to San Luis Obispo Bay in the Pacific Ocean approximately six miles south of the study area. The creeks, seasonal drainages, and wetlands in the study area qualify as waters of the United States. The specific characteristics of the waters of the United States are further described in the delineation report (Appendix A). Annual precipitation averages 35.6 to 63.5 centimeters (14 to 25 inches) in the project vicinity (Ernstrom 1984).

3.1.3 Biological Conditions in the Biological Study Area

A total of 9 distinct vegetation community types was identified and mapped in the study area, including Central Coast arroyo willow riparian forest, seasonal wetland, freshwater marsh,

seasonal drainage, perennial drainage, nonnative annual grassland, agricultural, ruderal, and developed/landscape. Of these, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage are potential waters of the United States. Figures 3-1a and 3-1b show the locations of natural communities and other biological resources located in the study area.

The study area supports both common natural communities and natural communities of special concern. Common natural communities are habitats that have low species diversity, are widespread, reestablish naturally after disturbance, or support primarily nonnative species. These communities are not generally protected by agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). The common natural communities in the study area are nonnative annual grassland, agricultural, ruderal, and developed/landscape.

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important. The CNDDB contains a current list of rare natural communities throughout the state. USFWS considers certain habitats, such as wetlands and riparian forest communities, important to wildlife, and the Corps and EPA consider wetland habitats important for water quality and wildlife. The habitats in the study area that meet criteria for natural communities of special concern are Central Coast arroyo willow riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage.

Locations, dominant plant species, and typical wildlife species found in the vegetation communities and developed areas within the study area are described below. A list of all plant and wildlife species observed in the study area and scientific names mentioned in text are provided in Appendix E.

3.1.3.1 Central Coast Arroyo Willow Riparian Forest

The Central Coast arroyo willow riparian forest communities in the study area occur along Prefumo Creek and San Luis Obispo Creek west and east of LOVR. One small piece of riparian forest habitat also occurs near the realignment of Calle Joaquin. This community type is multi-layered with trees, small trees and shrubs, and herbaceous layers. Riparian forest vegetation occurs on both banks of the creeks and varies from approximately 23 meters (75 feet) wide on the upstream portion of Prefumo Creek in the study area to approximately 198 meters (650 feet) wide around the confluence of the two creeks. Dominant tree species in the Central Coast arroyo willow riparian forest community include arroyo willow (*Salix lasiolepis*), walnut (*Juglans* sp.), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and coast live oak (*Quercus agrifolia*). Common shrubs include coyote brush (*Baccharis pilularis*), California coffeeberry (*Rhamnus californica*), California blackberry (*Rubus ursinus*), and elderberry (*Sambucus mexicana*). Giant reed (*Arundo donax*), an invasive species common in riparian forest areas, occurs in isolated clumps. Common herbaceous species in riparian forest habitat include poison hemlock (*Conium maculatum*), common horsetail (*Equisetum arvense*), sweetclovers (*Melilotus albus* and *M. indica*), mugwort (*Artemisia douglasiana*), pearly everlasting (*Anaphalis margaritacea*), periwinkle (*Vinca major*), garden nasturtium (*Troaeolum majus*), cocklebur (*Xanthium strumarium*), manroot (*Marah fabaceus*), and chain speedwell (*Veronica catenata*).

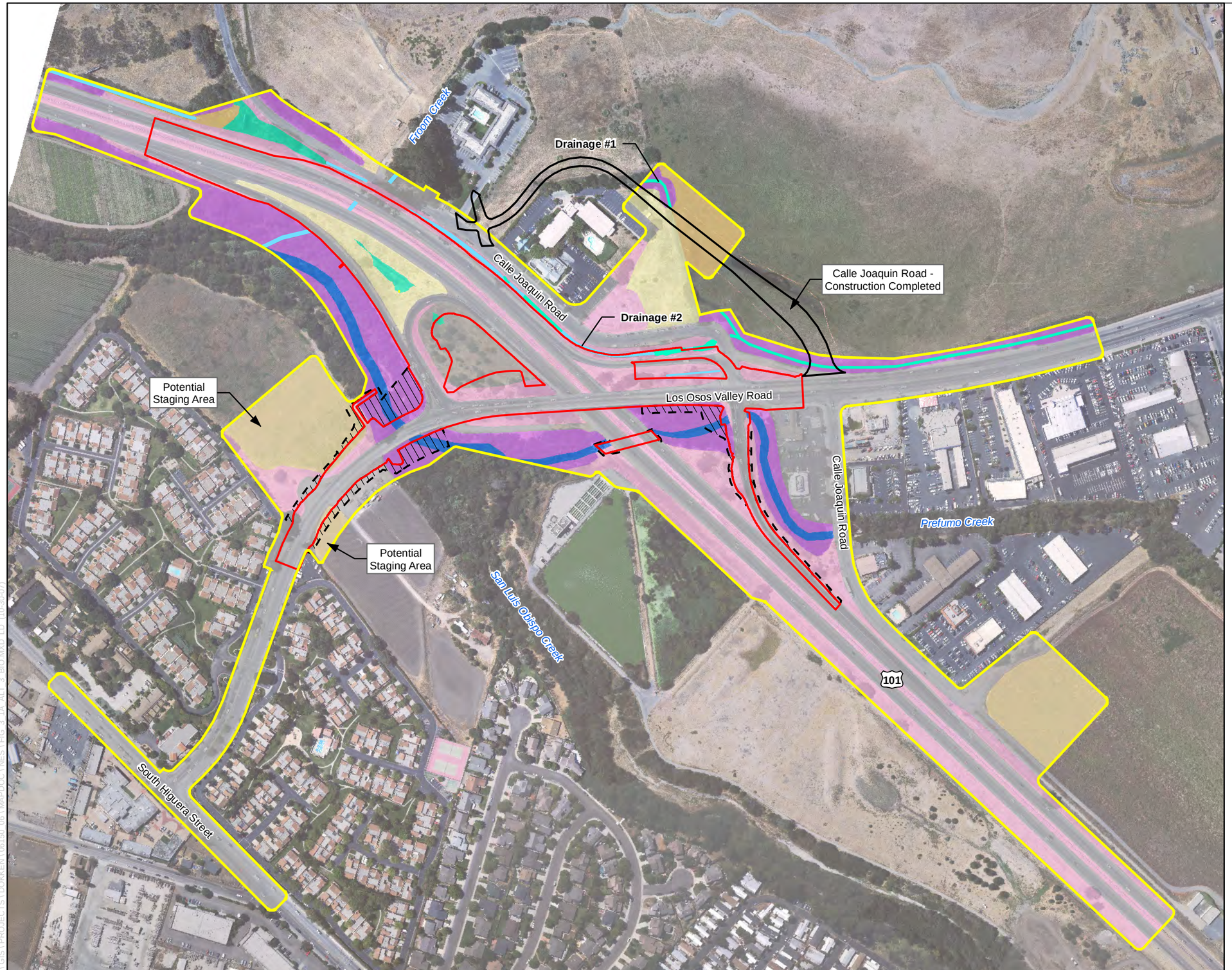

Figure 3-1a
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Permanent Impact Area Under Alternative 3 (Minimum Build)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

325 0 325 650
Feet

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Figure 3-1b
Impacts to Biological Resources Under Alternative 6 (Near Full Standard)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Seasonal Drainage
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Wetland
- Permanent Impact Area Under Alternative 6 (Near Full Standard)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

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S:\GIS\PROJECTS\DOKKEN\06150_06\MAPDOC\NES\FIG_3_1B_ALT_6_BIO.MXD LD (10-30-07)

Photo 1. Looking Down Prefumo Creek at the Culvert under Highway 101 South-bound Offramp.

Photo 2. San Luis Obispo Creek Bridge Crossing at Los Osos Valley Road.

Photo 3. Upstream San Luis Obispo Creek North of Los Osos Valley Road.

Photo 4. Looking Downstream San Luis Obispo Creek South of Los Osos Valley Road.

06150.06 NES (8-06)

Figure 3-2a
Representative Photographs of Prefumo Creek and San Luis Obispo Creek in the Study Area

Photo 1. Seasonal Wetland South of Northbound Highway 101 Onramp.

Photo 2. Seaonal Wetland and Sycamore Woodland North of Northbound Highway 101 Onramp.

Photo 3. Looking South at Seasonal Wetland West of Highway 101.

06150.06 NES (8-06)

Figure 3-2b
Representative Photographs of Seasonal Wetlands in the Study Area

Riparian forest woodlands in the study area provide potential nesting and perching habitat for a number of migratory birds and raptors observed during the 2006 field surveys, including lesser goldfinch (*Carduelis psaltria*), bushtit (*Psaltriparus minimus*), western scrub jay (*Aphelocoma californica*), song sparrow (*Melospiza melodia*), black phoebe (*Sayornis saya*), American kestrel (*Falco tinnunculus*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), and great-horned owl (*Bubo virginianus*). Riparian forest vegetation also provides escape cover and foraging areas for wildlife that forage along the adjacent aquatic and grassland habitats. Mammals found near riparian forests include California vole, Virginia opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). Common and terrestrial garter snakes (*Thamnophis sirtalis and elegans*) can also be found foraging and resting within this habitat.

3.1.3.2 Seasonal Wetland

Seasonal wetland communities in the study area occur primarily associated with roadside drainages and basins south of LOVR. Two of the areas mapped as seasonal wetland in the study area are located in the northbound on-ramp cloverleaf. These two seasonal wetlands are connected by a culvert under the on-ramp and receive runoff from the adjacent roads. Another mapped location is between the highway and Calle Joaquin where the roadside drainage widens to a basin beneath a billboard. This seasonal wetland receives runoff via the roadside drainage north of the wetland, which widens into a basin where the seasonal wetland and freshwater marsh occur. Common species in the seasonal wetlands include poison hemlock, Bermuda grass, birdfoot trefoil (*Lotus corniculatus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), Italian ryegrass (*Lolium multiflorum*), curly dock, bristly ox-tongue (*Picris echioides*), and Harding grass.

Additional seasonal wetland areas within the Calle Joaquin realignment project area include a spring-fed drainage channel that supports wetland vegetation located west of Calle Joaquin Road (Drainage 1) and seasonal wetlands located within the roadside drainage that crosses from the east side of LOVR to the west side of Calle Joaquin Road (Drainage 2). These roadside drainage wetlands convey runoff from the freshwater marsh and riparian vegetation east of LOVR and from the adjacent roads.

Seasonal wetlands support a large number of insects that constitute a food source for a variety of birds, amphibians, and reptiles. During the July 2006 field survey, a great egret (*Ardea alba*) and red-winged blackbirds (*Agelaius phoeniceus*) were observed in the vicinity of seasonal wetlands in the study area. Tall vegetation associated with the seasonal wetland on the west side of U.S. 101 may provide nesting habitat for migratory birds.

3.1.3.3 Freshwater Marsh

The study area supports two locations of freshwater marsh community. One freshwater marsh is located within the approved Calle Joaquin realignment project area in Froom Ranch at the base of the Irish Hills. Froom Creek, which is intermittent in the vicinity of the study area but with a perennial reach upstream, is approximately 122 meters (400 feet) outside and west of the study area edge and the marsh. The marsh feature is within the floodplain of Froom Creek and is in an area of high ground water (Morro Group, Inc. 2005). This feature has been previously delineated as part of the Calle Joaquin realignment project (Morro Group, Inc. 2004a). Portions of the marsh are perennially wet. Dominant plant species include iris-leaved rush (*Juncus xiphioides*), sedges (*Carex* spp.), creeping leather root (*Hoita orbiculatus*), coastal silverweed (*Potentilla*

anserina ssp. *pacifica*), bull thistle (*Cirsium vulgare*), birdfoot trefoil, goldentop (*Lamarckia aurea*), and meadow fescue (*Festuca arundinacea*). Dominant plant species in the wettest areas include tule (*Scirpus acutus*), iris-leaved rush, seep monkeyflower (*Mimulus guttatus*), and watercress (*Rorippa nasturtium-aquatica*).

The other freshwater marsh is located between U.S.101 and Calle Joaquin. This feature appears to be perennial, possibly due to high ground water. Dominant species in this community include narrow-leaved cattail (*Typha angustifolia*), iris-leaved rush, Himalayan blackberry (*Rubus discolor*), sneezeweed (*Helenium puberulum*), and fringed willowherb (*Epilobium ciliatum*).

Common bird species observed within freshwater marsh habitats in the study area include red-winged blackbird, song sparrow, and mallard (*Anas platyrhynchos*). Freshwater marsh wetlands in the study area also provide habitat for aquatic amphibians and reptiles such as the Pacific tree frog (*Hyla regilla*) and common garter snake.

3.1.3.4 Seasonal Drainage

Several seasonal drainages traverse the study area. Two seasonal drainages have been previously evaluated in a wetland delineation for the Calle Joaquin realignment project, and are referred to as Drainage 1 and Drainage 2 in that delineation (Morro Group, Inc. 2004a). Drainage 1 is spring fed and enters an underground culvert at its south end that emerges at the confluence with Froom Creek on the west side of Calle Joaquin. Froom Creek crosses under U.S. 101 at this location to its confluence with San Luis Obispo Creek. Drainage 1 supports Central Coast arroyo willow riparian forest vegetation, dominated by arroyo willow, dogwood (*Cornus sericea*), California bay (*Umbellularia californica*), California blackberry, and cattail.

Drainage 2 parallels LOVR and U.S. 101 and is fed by urban runoff. The north portion of Drainage 2 in the study area floods into the adjacent freshwater marsh under high flow conditions. The northern portion of Drainage 2 supports Central Coast arroyo willow riparian forest vegetation, including arroyo willow, poison hemlock, sweet fennel (*Foeniculum vulgare*), teasel (*Dipsacus fullonum*), and milk thistle (*Silybum marinum*). The southern portion along Calle Joaquin supports scattered arroyo willow and eucalyptus, coyote brush, poison hemlock, a small area of tule and cattail, and ruderal herbaceous species.

The study area also includes a seasonal drainage that parallels U.S. 101 and is separated from the southern end of Drainage 2 by a stand of eucalyptus. This drainage flows south and expands into a seasonal wetland in a basin area between U.S. 101 and Calle Joaquin. The lowest point of the basin supports freshwater marsh that appears to be perennial, and then continues to another segment of seasonal drainage at the southernmost part of the study area. The upstream portion of this seasonal drainage is dominated by coyote brush, California blackberry, poison hemlock, and mugwort. The southernmost end of the drainage supports Central Coast arroyo willow riparian forest, with some nonnatives, such as pepper tree.

A small segment of seasonal drainage lies between LOVR and the southbound on-ramp to U.S. 101. This feature is similar to Drainage 2 and is fed by runoff from the surrounding roads. A culvert connects this seasonal drainage to a patch of creeping wildrye surrounded by ruderal vegetation in an island between LOVR, Calle Joaquin, and a dirt road. The drainage supports a ruderal understory with several trees, including willow, eucalyptus, and pepper tree.

The value of seasonal drainages as wildlife habitat varies with the duration and intensity of water flow. During the wet season, intermittent drainages are used by a variety of wildlife species. Mammals such as raccoons and opossum use the habitats for drinking and washing their food. Shorebirds and waterfowl may use intermittent drainages for resting or foraging, whereas these habitats may serve as travel corridors for amphibians, invertebrates, or other highly aquatic wildlife. Wildlife species observed in or adjacent to seasonal drainages in the study area during the 2006 field surveys included great egret, song sparrow, and mallard.

3.1.3.5 Perennial Drainage

Two perennial drainages cross the study area, Prefumo Creek and San Luis Obispo Creek. Froom Creek, an intermittent stream within the study area, drains to San Luis Obispo Creek from an underground RCB culvert beneath U.S. 101. The mainstem of San Luis Obispo Creek begins near the top of Cuesta Grade. Prefumo and Froom Creeks are tributaries to San Luis Obispo Creek. Prefumo Creek drains the northeastern side of the Irish Hills range southwest of the city of San Luis Obispo and Froom Creek drains the eastern side of the Irish Hills (Tamagni 1995). Perennial flow in Froom Creek only occurs in its upper watershed, upstream of the study area. San Luis Obispo Creek eventually drains to San Luis Obispo Bay. These drainages cross study area roadways via cement box culverts and steel pipe culverts of varying sizes. Dense riparian forest vegetation borders San Luis Obispo and Prefumo Creek throughout the study area, as described above in section 3.1.3.1.

Perennial drainages in the study area provide habitat for a variety of wildlife and fish. Vegetation growing along the edges of drainages provides nesting habitat for several bird species and foraging and refuge habitat for amphibians, reptiles, and mammals occupying the open water and adjacent grassland habitats. Birds such as herons and belted kingfishers forage in these communities, primarily along the water's edge. Many species of insectivorous birds, including white-throated swift (*Aaeronautes saxatalis*), barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), black phoebe, and ash-throated flycatcher (*Myiarchus cinerascens*), catch their prey over open water. Native fish species in San Luis Obispo Creek and Prefumo Creek include speckled dace (*Rhinichthys osculus*), prickly sculpin (*Cottus asper*), threespine stickleback (*Gasterosteus aculeatus*), south-central California coast steelhead and Pacific lamprey (*Lampetra tridentata*). Steelhead occur also in perennial reaches of Froom Creek and the segment of Froom Creek within the study area is used as a migratory corridor for adults migrating to upstream spawning habitat and juveniles emigrating to the ocean. Introduced species such as goldfish, largemouth bass, green sunfish, bluegill, mosquitofish, channel catfish, brown bullhead, golden shiners, and fathead minnows are also present in the watershed (Tamagni 1995).

3.1.3.6 Nonnative Annual Grassland

Nonnative annual grassland is a common natural community that consists of annual grasses and a variety of native and nonnative annual forbs. It occurs within several areas south of LOVR. Dominant plant species within these areas include wild oat (*Avena barbata* and *A. fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), squirreltail barley (*Hordeum murinum* ssp. *leporinum*), creeping wildrye (*Leymus triticoides*), and Italian ryegrass. Other characteristic species include scarlet pimpernel (*Anagallis arvensis*), mustards (*Brassica nigra* and *B. rapa*), Italian thistle (*Carduus pycnocephalus*), purple and yellow star-thistles (*Centaurea calciptrapa* and *C. solstitialis*), poison hemlock, teasel, redstem filaree (*Erodium cicutarium*),

sweet fennel, birdfoot trefoil, bristly ox-tongue, buckhorn plantain (*Plantago coronopus*), willow dock (*Rumex salicifolius*), sow thistles (*Sonchus asper* and *S.oleraceus*), salsify (*Tragopogon porrifolius*), rose clover (*Trifolium hirtum*), woolly mullein (*Verbascum thapsus*), and vetch (*Vicia sativa*).

Nonnative annual grassland in the study area provides foraging habitat and cover for many wildlife species. Wide-ranging animals, such as turkey vultures (*Cathartes aura*), red-tailed hawks, and coyotes (*Canis latrans*), are common in the area. Wildlife species observed within nonnative annual grasslands in the study area include killdeer (*Charadrius vociferous*), gopher snake (*Pituophis melanoleucus*), California ground squirrel (*Spermophilus beecheyi*), and black-tailed hare (*Lepus californicus*).

3.1.3.7 Agricultural

Agricultural lands surround much of the development in the study area on both sides of the highway and LOVR. Crops include strawberries, wheat, and corn, although most fields were disced or fallow at the time of the botanical surveys. Common species in the fallow fields include saltweed (*Atriplex* sp.), mustards, shepherd's purse (*Capsella bursa-pastoris*), mouse-ear chickweed (*Cerastium glomeratum*), pineapple weed (*Chamomilla suaveolens*), giraffe head (*Lamium amplexicaule*), broad-leaved pepper-grass (*Lepidium latifolium*), common groundsel (*Senecio vulgaris*), dwarf nettle (*Urtica urens*), and neckweed (*Veronica peregrina*).

Depending on the crop pattern and the proximity to native habitats, agricultural lands can provide relatively high-value habitat for wildlife, particularly as foraging habitat. Raptors use row and grain crop agricultural lands for foraging because several species of common rodents are found in agricultural fields. Raptor species observed foraging in and adjacent to the study area during the January 2006 field survey included great-horned owl, barn owl (*Tyto alba*), red-tailed hawk and red-shouldered hawk. Agricultural habitats also provide foraging and resting habitat for migrating and wintering waterfowl and shorebirds, especially during the winter months.

3.1.3.8 Ruderal

Much of the area adjacent to roadsides in the study area supports ruderal vegetation. This community is similar to the nonnative annual grassland, but supports more weedy forbs and some nonnative trees. Common species observed in ruderal areas include annual grasses, mustards, Italian thistle, pampas grass (*Cortaderia jubata*), English ivy (*Hedera helix*), rough cat’s ear (*Hypochaeris radicata*), cheeseweed (*Malva parviflora*), California plantain (*Plantago erecta*), English plantain (*Plantago lanceolata*), birdfoot trefoil, wild radish (*Raphanus sativa*), milk thistle, sow thistles, and cow clover (*Trifolium wormskioldii*). Trees in ruderal areas include eucalyptus, date palm (*Phoenix* sp.), weeping willow (*Salix babylonica*), and pepper tree.

Wildlife species’ abundance and diversity are relatively low in ruderal habitats in the study area. Common birds such as Brewer’s blackbird (*Euphagus cyanocephalus*), European starling (*Sturnus vulgaris*), common raven (*Corvus corax*), and house finch may forage along roadsides and in heavily disturbed areas.

3.1.3.9 Developed/Landscape

The areas included as the developed/landscaped community include paved or graded areas, buildings, and landscaping surrounding development consisting primarily of horticultural trees

and shrubs, with limited areas of herbaceous flowering plants and turf grass. Developed/landscaped areas also includes the isolated area within the U.S. 101 northbound on-ramp cloverleaf. This piece of land is surrounded by LOVR, the on-ramp, and the highway. This area is a result of planting for highway landscaping. The area includes a stand of western sycamores (*Platanus racemosa*) with few coast live oaks and an herbaceous understory that includes Harding grass (*Phalaris aquatica*), Bermuda grass (*Cynodon dactylon*), and curly dock (*Rumex crispus*). Nonnative trees, including eucalyptus (*Eucalyptus globulus*) and pepper tree (*Schinus molle*) occur on the slopes at the road edges.

Developed/landscaped areas generally provide low value for wildlife. Songbirds, such as American robin (*Turdus migratorius*), Brewer's blackbird, house finch, and northern mockingbird (*Mimus polyglottos*) commonly feed on the fruits, nuts, and insects in landscaped areas.

3.1.3.10 Invasive Plant Species

Invasive plant species include species designated as federal noxious weeds by the U.S. Department of Agriculture (USDA), species listed by the California Department of Food and Agriculture (CDFA), and other invasive plants designated by California Invasive Plant Council (Cal-IPC). Roads, highways, and related construction projects are some of the principal dispersal pathways for invasive plant species. The introduction and spread of invasive plants adversely affect natural plant communities by displacing native plant species that provide shelter and forage for wildlife species. Table 3-1 identifies the 39 invasive plant species located in the study area. These species occur within all vegetation community types in the study area.

3.2 Regional Species and Habitats of Concern

Tables 3-2 and 3-3 list sensitive plant, wildlife, and fish species that are known to occur or have the potential to occur in the geographic region. These species were identified based on the CNDDB records search (2006), CNPS Inventory of Rare and Endangered Plants (2006), USFWS lists of threatened and endangered species, and species distribution and habitat requirements data.

For the purpose of this NES, sensitive species are plants, animals, and fish that are legally protected under ESA, CESA, or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Sensitive plants, animals, and fish fall into the following categories:

- species listed or proposed for listing as threatened or endangered under ESA (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register [FR] [proposed species]);
- species that are candidates for possible future listing as threatened or endangered under ESA (70 FR 24870);
- species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] 670.5);

- species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380);
- plants listed as rare under CNPPA (CFGC 1900 et seq.);
- plants considered by CNPS to be "rare, threatened, or endangered in California" (2006);
- plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution, which may be included as special-status species on the basis of local significance or recent biological information;
- animal species of special concern to CDFG (Remsen 1978 [birds], Williams 1986 [mammals], and Jennings and Hayes 1994 [amphibians and reptiles]); and
- animals fully protected in California (CFGC 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

3.2.1.1 California Natural Diversity Database Search Results

The CNDDB (2006) search indicated that 62 sensitive species (32 plant species, 29 wildlife species, and one fish species) have been recorded within 16 kilometers (10 miles) of the study area (Appendix C). None of these sensitive species have been recorded within the study area.

3.2.1.2 U.S. Fish and Wildlife Service Species List

USFWS provided a list of 38 sensitive species (16 plant species, 20 wildlife species, and two fish species) federally listed as threatened or endangered that may occur in the study area or be affected by projects in the in San Luis Obispo County (Appendix D).

3.2.1.3 Sensitive Plant Species

During the prefield investigation, 60 sensitive plant species were determined to have the potential to occur in the project region (Table 3-2). Suitable to marginally suitable plant communities and soil types for 11 species were identified in the study area—marsh sandwort, San Luis Obispo sedge, Obispo Indian paintbrush, Congdon's tarplant, leafy tarplant, Hoover's button-celery (marginal habitat in disturbed seasonal wetlands), Gambel's water cress, adobe sanicle, black-flowered figwort, rayless ragwort (marginal habitat, study area habitats not alkaline enough), and saline clover. Plant surveys were conducted following CNPS, DFG, and USFWS guidelines (CNPS 2001, DFG 2000, USFWS 1996) and during blooming periods in May and July when these species would be identifiable (see Table 2-1 on page 2-2). The community types in the study area that could support sensitive plant species generally have a high level of disturbance from previous and ongoing activities, such that suitable microhabitat conditions for most sensitive plant species are not present (It should be noted that Congdon's tarplant occurs in highly disturbed substrates, but was not observed during the blooming period surveys). Therefore, the study area has a low potential to support sensitive plant species. No sensitive plant species were observed during the May or July botanical surveys.

Based on the negative results of spring and summer botanical field surveys conducted in the study area, the botanist determined that the study area does not support sensitive plant species.

Table 3-1. Invasive Plant Species Located in the Study Area

Species	CDFA	Cal-IPC
Giant reed (*Arundo donax)*	B	High
Slender wild oat (*Avena barbata*)	–	Moderate
Wild oat (*Avena fatua*)	–	Moderate
Black mustard (*Brassica nigra*)	–	Moderate
Field mustard (*Brassica rapa*)	–	Limited
Ripgut brome (*Bromus diandrus*)	–	Moderate
Soft chess (*Bromus hordeaceus*)	–	Limited
Red brome (*Bromus madritensis* ssp. *rubens*)	–	High
Hoary cress (*Cardaria draba*)	B	Moderate
Plumeless thistle (*Carduus acanthoides*)	A	Limited
Italian thistle (*Carduus pycnocephalus*)	C	Moderate
Purple star-thistle (*Centaurea calcitrapa*)	B	Moderate
Bull thistle (*Cirsium vulgare*)	–	Moderate
Poison hemlock (*Conium maculatum*)	–	Moderate
Pampas grass (*Cortaderia jubata*)	–	High
Bermuda grass (*Cynodon dactylon*)	C	Moderate
Teasel (*Dipsacus fullonum*)	–	Moderate
Redstem filaree (*Erodium cicutarium*)	–	Limited
Blue gum (*Eucalyptus globulus*)	–	Moderate
Meadow fescue (*Festuca arundinacea*)	–	Moderate
Fennel (*Foeniculum vulgare*)	–	High
Geranium (*Geranium dissectum*)	–	Moderate
English ivy (*Hedera helix*)	–	High
Perennial mustard (*Hirschfeldia incana*)	–	Moderate
Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*)	–	Moderate
Rough cat's ear (*Hypochaeris radicata*)	–	Moderate
Broad-leaved pepper-grass (*Lepidium latifolium*)	B	High
Italian ryegrass (*Lolium multiflorum*)	–	High
Harding grass (*Phalaris aquatica)*	–	Moderate
Bristly ox-tongue (*Picris echioides*)	–	Limited
English plantain (*Plantago lanceolat*a)	–	Limited
Rabbitsfoot grass (*Polypogon monspeliensis*)	–	Limited
Wild radish (*Raphanus sativus*)	–	Limited
Castorbean (*Ricinus communis*)	–	Limited
Himalayan blackberry (*Rubus discolor*)	–	High
Curly dock (*Rumex crispus*)	–	Limited
Milk thistle (*Silybum marinum*)	–	Limited
Rose clover (*Trifolium hirtum*)	–	Moderate
Bigleaf periwinkle (*Vinca major*)	–	Moderate

Notes: The CDFA and Cal-IPC lists assign ratings that reflect the CDFA and CalIPC views of the statewide importance of the pest, likelihood that eradication or control efforts would be successful, and present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances.

The CDFA categories indicated in the table are defined as follows:

- **A:** Eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.
- **B:** Eradication, containment, control or other holding action at the discretion of the commissioner.
- **C:** State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside nurseries at the discretion of the commissioner.

The Cal-IPC categories indicated in the table are defined as follows:

- **High:** Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.
- **Moderate:** Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, establishment dependent on disturbance, and limited to widespread distribution.
- **Limited:** Species with minor ecological impacts, low to moderate rates of invasion, limited distribution, and locally persistent and problematic.

Table 3-2. Sensitive Plant Species in the Project Region

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Hoover's bent grass, *Agrostis hooveri*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Chaparral, cismontane woodland, valley and foothill grassland, usually on sandy soils; 60–600 meters	April–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Arroyo de la Cruz manzanita, *Arctostaphylos cruzensis*	–	–	1B	Monterey and San Luis Obispo Counties	Broadleaved upland forest, coastal bluff scrub, closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland on sandy soils; 60–310 meters	December–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Santa Lucia manzanita, *Arctostaphylos luciana*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland on shale; 350–850 meters	February–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Morro manzanita, *Arctostaphylos morroensis*	T	–	1B	San Luis Obispo County	Maritime chaparral, cismontane woodland, pre-Flandrian coastal dunes, coastal scrub on sandy loam; 5–205 meters	December–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Oso manzanita, *Arctostaphylos osoensis*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland on dacite porphyry buttes; 300–500 meters	February–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Pecho manzanita, *Arctostaphylos pechoensis*	–	–	1B	San Luis Obispo County	Closed-cone coniferous forest, chaparral, coastal scrub on siliceous shale; 150–850 meters	November–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Santa Margarita manzanita, *Arctostaphylos pilosula*	–	–	1B	Monterey and San Luis Obispo Counties	Closed-cone coniferous forest, chaparral, cismontane woodland on shale; 170–1,100 meters	December–March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Sand mesa manzanita, *Arctostaphylos rudis*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Maritime chaparral, coastal scrub on sandy soils; 25–230 meters	November–February	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Dacite manzanita, *Arctostaphylos tomentosa* ssp. *daciticola*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland on dacite porphyry buttes; 100–300 meters	March	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Wells's manzanita, *Arctostaphylos wellsii*	–	–	1B	San Luis Obispo County	Closed-cone coniferous forest, chaparral on sandy soils; 30–400 meters	December–April	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Marsh sandwort, *Arenaria paludicola*	E	E	1B	Los Angeles,[b] Mendocino, San Bernardino,[b] Santa Cruz,[b] San Francisco,[b] San Luis Obispo; Washington	Bogs and fens, freshwater marshes and swamps; 3–170 meters	May–August	No	Yes	Species was not observed in the study area during botanical surveys.
Miles's milk-vetch, *Astragalus didymocarpus* var. *milesianus*	–	–	1B	Santa Barbara, San Luis Obispo, and Ventura Counties	Coastal scrub on clay soils; 20–90 meters	March–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis mariposa lily, *Calochortus obispoensis*	–	–	1B	San Luis Obispo County	Chaparral, coastal scrub, valley and foothill grassland, often on serpentine soils; 75–730 meters	May–July	No	Yes	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis Obispo mariposa lily, *Calochortus simulans*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland on sandy, often granitic, sometimes serpentine soils; 395–1,100 meters	April–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Cambria morning-glory, *Calystegia subacaulis ssp. episcopalis*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland; 60–500 meters	April–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
San Luis Obispo sedge, *Carex obispoensis*	–	–	1B	Monterey and San Luis Obispo Counties	Closed -cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland, often serpentine seeps; 10–790 meters	April–June	No	Yes	Species was not observed in the study area during botanical surveys.
Obispo Indian paintbrush, *Castilleja densiflora* ssp. *obispoensis*	–	–	1B	San Luis Obispo County	Valley and foothill grassland; 10–400 meters	March-May	No	Yes	Species was not observed in the study area during botanical surveys.
California jewelflower, *Caulanthus californicus*	E	E	1B	Fresno, Kings,[b] Kern, Santa Barbara, San Luis Obispo, Tulare,[b] and Ventura [b] Counties	Chenopod scrub, pinyon-juniper woodland, valley and foothill grassland on sandy soils; 70–100 meters	February–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Congdon's tarplant, *Centromadia parryi* ssp. *congdonii*	–	–	1B	Alameda, Contra Costa, Monterey, Santa Clara, Santa Cruz,[b] San Luis Obispo, and Solano[b] Counties	Alkaline valley and foothill grassland; 1–230 meters	June–November	No	Yes	Species was not observed in the study area during botanical surveys.
Dwarf soaproot, *Chlorogalum pomeridianum* var. *minus*	–	–	1B	Colusa, Lake, San Luis Obispo, Sonoma, and Tehama Counties	Serpentine chaparral; 305–1,000 meters	May–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Purple amole, *Chloragalum purpureum* var. *purpureum*	T	–	1B	Northeastern outer south Coast Ranges, eastern Santa Lucia Mountains, Monterey County	Chaparral, Cismontane woodland, Valley and foothill grassland/gravelly, clay	April–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Camatta Canyon amole, *Chlorogalum purpureum* var. *reductum*	T	R	1B	San Luis Obispo County	Serpentine soils in cismontane woodland; 600–615 meters	April–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Brewer's spineflower, *Chorizanthe breweri*	–	–	1B	San Luis Obispo County	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub on serpentine, rocky, or gravelly soils; 45–800 meters	May–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Straight-awned spineflower, *Chorizanthe rectispina*	–	–	1B	Monterey, Santa Barbara, and San Luis Obispo Counties	Chaparral, cismontane woodland, coastal scrub; 200–1,035 meters	May–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Chorro Creek bog thistle, *Cirsium fontinale* var. *obispoensis*	E	E	1B	San Luis Obispo County	Chaparral, cismontane woodland in serpentine seeps; 35–365 meters	February–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
La Graciosa thistle, *Cirsium loncholepis*	E	T	1B	Santa Barbara and San Luis Obispo Counties	Mesic areas in coastal dunes, coastal scrub, brackish marshes and swamps; 4–220 meters	May–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Surf thistle, *Cirsium rhothophilum*	–	T	1B	Santa Barbara and San Luis Obispo Counties	Coastal bluff scrub, coastal dunes; 3–60 meters	April–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Pismo clarkia, *Clarkia speciosa* ssp. *immaculata*	E	R	1B	San Luis Obispo County	Chaparral in margins and openings, cismontane woodland, valley and foothill grassland on sandy soils; 25–185 meters	May–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Salt marsh bird's-beak, *Cordylanthus maritimus* ssp. *maritimus*	E	E	1B	Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, Ventura; Baja California	Coastal dunes, coastal salt marshes and swamps; below 30 meters	May–October	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Leafy tarplant, *Deinandra increscens* ssp. *foliosa*	–	–	1B	Monterey, Santa Barbara, and San Luis Obispo Counties	Valley and foothill grassland; 300–500 meters	June–September	No	Yes	Species was not observed in the study area during botanical surveys.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Dune larkspur, *Delphinium parryi* ssp. *blochmaniae*	–	–	1B	Santa Barbara, San Luis Obispo, and Ventura Counties	Maritime chaparral, coastal dunes; below 200 meters	April–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Beach spectaclepod, *Dithyrea maritima*	–	T	1B	Los Angeles,[b] Santa Barbara, and San Luis Obispo Counties; Santa Catalina Island,[b] San Miguel Island,[b] San Nicolas Island; Baja California	Coastal dunes, sandy areas in coastal scrub; 3–50 meters	March–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis Obispo serpentine dudleya, *Dudleya abramsii* ssp. *bettinae*	–	–	1B	San Luis Obispo County	Chaparral, coastal scrub, valley and foothill grassland on serpentine or rocky soils; 20–180 meters	May–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis Obispo dudleya, *Dudleya abramsii* ssp. *murina*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland on serpentine; 90–300 meters	May–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Blochman's dudleya, *Dudleya blochmaniae ssp. blochmaniae*	–	–	1B	Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura Counties; Baja California	Coastal bluff scrub, chaparral, coastal scrub, valley and foothill grassland on rocky, often clay or serpentine soils; 5–450 meters	April–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Blochman's leafy daisy, *Erigeron blochmaniae*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Coastal dunes, coastal scrub; 3–45 meters	July–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Indian Knob mountainbalm, *Eriodictyon altissimum*	E	E	1B	San Luis Obispo County	Maritime chaparral, cismontane woodland, coastal scrub on sandstone; 80–270 meters	March–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Hoover's button-celery, *Eryngium aristulatum* var. *hooveri*	–	–	1B	Alameda, San Benito, Santa Clara, and San Luis Obispo Counties	Vernal pools; 3–45 meters	July	No	Marginal	Species was not observed in the study area during botanical surveys.
San Benito fritillary, *Fritillaria viridea*	–	–	1B	Monterey, San Benito, and San Luis Obispo Counties	Serpentine areas in chaparral, 200–1,525 meters	March–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Mesa horkelia, *Horkelia cuneata* ssp. *puberula*	–	–	1B	Los Angeles, Orange, Riverside,[b] Santa Barbara, San Bernardino,[b] San Diego,[b] San Luis Obispo, and Ventura[b] Counties	Chaparral, cismontane woodland, coastal scrub on sandy or gravelly soils; 70–810 meters	February–September	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Kellogg's horkelia, *Horkelia cuneata* ssp. sericea	–	–	1B	Alameda,[b] Marin,[b] Monterey, Santa Barbara, Santa Cruz, San Francisco,[b] San Luis Obispo, and San Mateo Counties	Closed-cone coniferous forest, maritime chaparral, coastal scrub in openings on sandy or gravelly soils; 10–200 meters	April–September	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Coulter's goldfields, *Lasthenia glabrata* ssp. *coulteri*	–	–	1B	Colusa, Kern, Los Angeles,[b] Orange, Riverside, Santa Barbara, San Bernardino,[b] San Diego, San Luis Obispo, Santa Rosa Island, Tulare, and Ventura Counties; Baja California	Coastal salt marshes and swamps, playas, vernal pools; 1–220 meters	February–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Jones's layia, *Layia jonesii*	–	–	1B	Monterey and San Luis Obispo Counties	Chaparral, valley and foothill grassland on clay or serpentine soils; 5–400 meters	March–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis Obispo County lupine, *Lupinus ludovicianus*	–	–	1B	San Luis Obispo County	Chaparral, cismontane woodland on sandstone or sandy soils; 50–525 meters	April–July	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Nipomo Mesa lupine, *Lupinus nipomensis*	E	E	1B	San Luis Obispo County; known only from one extended occurrence of five populations on Nipomo Mesa	Coastal dunes; 10–50 meters	March–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Crisp monardella, *Monardella crispa*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Coastal dunes, coastal scrub; 10–120 meters	April–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Luis Obispo monardella, *Monardella frutescens*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Coastal dunes, sandy areas in coastal scrub; 10–200 meters	May–September	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Palmer's monardella, *Monardella palmeri*	–	–	1B	Monterey and San Luis Obispo Counties	Chaparral, cismontane woodland on serpentine; 200–800 meters	June–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Joaquin wooly-heads, *Monolopia [Lembertia] congdonii*	E	–	1B	Fresno, Kings, Kern, Santa Barbara, San Benito, San Luis Obispo, and Tulare[b] Counties	Chenopod scrub, sandy areas in valley and foothill grassland; 60–800 meters	February–May	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
California orcutt grass, *Orcuttia californica*	E	E	1B	Scattered occurrences in southwest California, Los Angeles, Riverside, San Diego, and Ventura Counties; Baja California	Vernal pools; 15-660 meters	April–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Diablo Canyon blue grass, *Poa diaboli*	–	–	1B	San Luis Obispo County	Closed-cone coniferous forest, mesic areas in chaparral, cismontane woodland, coastal scrub on shale, sometimes burned areas; 120–400 meters	March–April	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Gambel's water cress, *Rorippa gambelii*	E	T	1B	Los Angeles,[b] Orange,[b] Santa Barbara, San Bernardino,[b] San Diego,[b] and San Luis Obispo Counties; Baja California	Freshwater or brackish marshes and swamps; 5–330 meters	April–September	No	Yes	Species was not observed in the study area during botanical surveys.
Adobe sanicle, *Sanicula maritima*	–	R	1B	Alameda,[b] Monterey, San Francisco,[b] and San Luis Obispo Counties	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland on clay or serpentine soils; 30–240 meters	February–May	No	Yes	Species was not observed in the study area during botanical surveys.
Black-flowered figwort, *Scrophularia atrata*	–	–	1B	Santa Barbara and San Luis Obispo Counties	Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, riparian scrub; 10–500 meters	April–July	No	Yes	Species was not observed in the study area during botanical surveys.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Rayless ragwort, *Senecio aphanactis*	–	–	2	Alameda, Contra Costa, Fresno, Los Angeles, Merced, Orange, Riverside, Santa Barbara, Santa Clara, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, Solano, Santa Rosa Island, and Ventura Counties; Baja California	Chaparral, cismontane woodland, coastal scrub in alkaline areas; 15–800 meters	January–April	No	Marginal	No suitable soils (alkaline) are present in the study area. Species was not observed in the study area during botanical surveys.
Cuesta Pass checkerbloom, *Sidalcea hickmanii* ssp. *anomala*	–	R	1B	San Luis Obispo County	Closed-cone coniferous forest on serpentine; 600–800 meters	May–June	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Parish's checkerbloom, *Sidalcea hickmanii* ssp. *parishii*	C	–	1B	Santa Barbara, San Bernardino, and San Luis Obispo Counties	Chaparral, cismontane woodland, lower montane coniferous forest; 1,000-2500 meters	June–August	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
California seablite, *Suaeda californica*	E	–	1B	Alameda,[b] Santa Clara,[b] and San Luis Obispo Counties	Coastal salt marshes and swamps; below 5 meters	July–October	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Saline clover, *Trifolium depauperatum* var. *hydrophilum*	–	–	1B	Known historically from scattered occurrences in Alameda, Colusa, Monterey, Napa, San Benito, Santa Clara, San Luis Obispo, San Mateo, Solano, and Sonoma Counties	Marshes and swamps, mesic and alkaline annual grassland, vernal pools; below 300 meters	April–June	No	Yes	Species was not observed in the study area during botanical surveys.

Table 3-2. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS						
Caper-fruited tropidocarpum, *Tropidocarpum capparideum*	–	–	1B	Northwestern San Joaquin Valley with occurrences in Alameda,[b] Contra Costa,[b] Fresno, Glenn,[b] Monterey, Santa Clara,[b] San Joaquin,[b] and San Luis Obispo Counties	Alkaline hills in valley and foothill grassland; below 455 meters	March–April	No	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

[a] Status explanations:
– = no listing.
Federal
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
State
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
R = listed as rare under the California Native Plant Protection Act; this category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.
California Native Plant Society
1A = List 1A species: presumed extinct in California.
1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
4 = List 4 species: limited distribution—a watch list.

[b] Known populations believed extirpated from that county.

Table 3-3. Sensitive Wildlife and Fish Species Potentially Occurring in the Project Region

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State					
Invertebrates							
Monarch Butterfly *Danaus plexippus*	–	–	Throughout California	Groves of trees, especially eucalyptus, Monterey pine, and Monterey cypress	No	No	No suitable roosting trees are present in the study area. Roosting monarchs are known to occur within a large grove of eucalyptus trees along Prefumo Creek, approximately 0.5 mile north of the study area (CNDDB 2006).
Vernal pool fairy shrimp *Branchinecta lynchi*	T	–	Central Valley and central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County.	Common in vernal pools. Also found in sandstone rock outcrop pools.	No	No	No suitable vernal pool habitat is present in the study area. Protocol-level branchiopod surveys were conducted by Morro Goup, Inc. in 2004/2005 within wetlands mapped along the Calle Joaquin Road Realignment Project located adjacent to the study area. No vernal pool fairy shrimp were identified during those surveys.
Fish							
Tidewater Goby *Eucyclogobius newberryi*	E	SSC	The tidewater goby, found only in California, historically occurred in at least 87 California coastal lagoons from San Diego County to Humboldt County.	Restricted to coastal brackish shallow lagoons and lower stream reaches where the water is fairly still but not stagnant.	No	No	Suitable habitat conditions are not present in the study area. The study area is located approximately 8 miles upstream from San Luis Obispo Bay and the closest CNDDB (2006) record for the species occurs at least 5 miles downstream from the study area. No tidewater goby have been observed in the San Luis Obispo Creek in the vicinity of the study area (Otte pers. comm.)
Central California Coast Steelhead *Oncorhynchus mykiss*	T	–	Population range is from Russian River, south to Soquel Creek and to, but not including, the Pajaro River. Also found in the San Francisco and San Pablo Bay Basins.	Requires silt free gravel for spawning. Juveniles require cool water, refuge cover, and sufficient dissolved oxygen.	Yes	Yes	Species has been documented in the study area. San Luis Obispo and Prefumo Creeks, including those segments within the project area, are known to support steelhead. Reach of Froom Creek within the study area provides migratory habitat for adult and juvenile steelhead.

Table 3-3. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State					
Amphibians							
California red-legged frog *Rana aurora draytoni*	T	SSC	Along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehema County to Fresno County.	Permanent and semi-permanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	Yes	Yes	Within the study area, suitable habitat is present within Prefumo Creek and San Luis Obispo Creek and within the adjacent wastewater treatment ponds. California red-legged frogs were observed within a concrete channel at the abandoned wastewater treatment plant facilities.
California tiger salamander, central population *Ambystoma californiense*	T	SSC	Central Valley, including Sierra Nevada foothills, up to approximately 305 meters (1,000 feet) above sea level and coastal region from Butte County to northeastern San Luis Obispo County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy. Salamanders are known to travel up to 1.3 miles from breeding sites.	No	No	No suitable aquatic breeding habitat is present in study area. Presence of fish and bullfrogs at the wastewater treatment ponds would preclude successful breeding at these areas. In addition, the upland vegetation is very tall and dense, thereby making it unsuitable habitat for this species.
Foothill yellow-legged frog *Rana boylii*	–	SSC	Klamath, Cascade, north Coast, south Coast, and Transverse Ranges; through the Sierra Nevada foothills up to approximately 1,800 meters (6,000 feet) above sea level, south to Kern County	Creeks or rivers in woodlands or forests with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby	Not observed	Yes	No foothill yellow-legged frogs were observed during protocol-level surveys for California red-legged frog conducted for the proposed project

Table 3-3. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State					
Reptiles							
Southwestern pond turtle *Actinemys marmorata pallida*	–	SSC	Occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts; range overlaps with that of the northwestern pond turtle throughout the Delta and in the Central Valley from Sacramento County to Tulare County	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Overwintering habitat consists of mud in stream and pond bottoms or a variety of upland habitats including riparian habitat. Eggs are laid in earthen cavities, usually in sunny locations within 1,640 feet of aquatic habitat.	Yes	Yes	Suitable aquatic habitat for southwestern pond turtles is present within Prefumo and San Luis Obispo Creeks in the study area. One adult pond turtle was observed in Prefumo Creek near the confluence with San Luis Obispo Creek in the study area during the April 2006 field surveys.
Two-striped garter snake *Thamnophis hammondii*	–	SSC	Known range extends through the south coast and peninsular ranges west of the San Joaquin valley from the Salinas Valley and the southeastern slopes of the Diablo range, south to the Mexican border	Perennial and intermittent streams having rocky beds bordered by willow thickets or other dense vegetation. Also inhabits large sandy riverbeds, such as the Santa Clara river, if a strip of riparian vegetation is present, and stock ponds if riparian vegetation and fish and amphibian prey are present	Not observed	Yes	San Luis Obispo Creek in the study area provides potential habitat for the species.
Birds							
Bald eagle *Haliaeetus leucocephalus*	D	E, FP	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County.	In western North America, nests and roosts in coniferous forests within 1.6 kilometer (1 mile) of a lake, reservoir, stream, or the ocean.	No	No	Potential winter visitor but would not nest in the study area. Known to nest at four reservoirs in San Luis Obispo County.

Table 3-3. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State					
Cooper's hawk *Accipiter cooperii*	–	SSC	Throughout California except at high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range; permanent residents occupy the rest of the state	Nests primarily in riparian forests dominated by deciduous species; also nests in densely canopied forests from grey pine–oak woodland up to ponderosa pine; forages in open woodlands	Not observed	Yes	Riparian woodlands in the study area provide suitable nesting habitat.
Northern harrier *Circus cyaneus*	–	SSC	Throughout lowland California. Has been recorded in fall at high elevations.	Grasslands, meadows, marshes, and seasonal and agricultural wetlands.	Not observed	Yes	Freshwater marsh in the study area provides suitable habitat; however, this area will be heavily disturbed from the construction of the realigned Calle Joaquin Road and therefore impacts are not considered in this NES.
Tricolored blackbird *Agelaius tricolor*	–	SSC	Largely endemic to California; permanent residents in the Central Valley from Butte County to Kern County; at scattered coastal locations from Marin County south to San Diego County; breeds at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; nesting habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony; requires large foraging areas, including marshes, pastures, agricultural wetlands, dairies, and feedlots, where insect prey is abundant	No	No	Suitable nesting habitat capable of supporting a large colony of nesting birds is not present in the study area.
White-tailed kite *Elanus leucurus*	–	FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at the Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Not observed	Yes	Riparian woodlands in the study area provide suitable nesting habitat.
Western burrowing owl *Athene cunicularia hypugea*	–	SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast.	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows.	Not observed	Yes	Suitable habitat is present within and adjacent to the study area.

Table 3-3. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Species Present in Study Area?	Habitat Present in Study Area?	Rationale
	Federal	State					
Western yellow billed cuckoo *Coccyzus americarus*	C	E	Nests along the upper Sacramento, lower Feather, south fork of Kern, Amargosa, Santa Ana, and Colorado Rivers.	Wide, dense riparian forests with a thick understory of willows for nesting. Sites with a dominant cottonwood overstory are preferred for foraging. May avoid valley-oak riparian habitats where scrub jays are abundant.	No	No	Suitable habitat conditions are not present in the study area. Historic records from 1921 and 1932 indicate that nesting may have occurred in the vicinity of San Luis Obispo Creek north of the study area. The study area does not occur within the current range of the species.
Mammals							
Pallid bat *Antrozous pallidus*	–	SSC	Occurs throughout California except the high Sierra from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts	Not observed	No	Could forage in the study area but suitable roosting habitat is not present.

[a] Status explanations:

– = no listing.

Federal
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
C = candidate to become a proposed species.
D = delisted (delisted species are monitored for 5 years)

State
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.

3.2.1.4 Sensitive Wildlife Species

The following species from the USFWS species list would not occur in the project area either because the project area is outside the species known range or because no suitable habitat was found in the project area for the species:

- Arroyo toad (*Bufo microscaphus californicus*)
- California tiger salamander (*Ambystoma californiense*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Brown pelican (*Pelicanus occidentalis*)
- California clapper rail (*Rallus longirostris obsoletus*)
- California condor (*Gymnogyps californianus*)
- California least tern (*Sterna antillarum browni*)
- Least bell's vireo (*Vireo bellii pusillus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Yellow-billed cuckoo (*Coccyzus americanus*)
- Longhorn fairy shrimp (*Branchinecta longiantenna*)
- Morro shoulderband snail (*Helminthoglypta walkeriana*)
- Smith's blue butterfly (*Euphilotes enoptes smithi*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Giant kangaroo rat (*Dipodomys ingens*)
- Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)
- San Joaquin kit fox (*Vulpes macrotis*)
- Southern sea otter (*Enhydra lutris nereis*)
- Blunt-nosed leopard lizard (*Gambelia silus*)

These species are not discussed further.

Based on a review of existing information, 15 sensitive wildlife species were identified as having the potential to occur within the project region (Table 3-3). After completion of reconnaissance-level field surveys and review of species distribution and habitat requirements data, the biologist determined that eight of the 15 species would not occur at the study area because the area lacks suitable habitat for the species or is outside the species' known range. An explanation for the absence each of these species from the study area is provided in Table 3-3.

Suitable habitat for CRLF is present within and adjacent to the study area in San Luis Obispo Creek, Prefumo Creek, and two artificially created ponds on the City of San Luis Obispo's Water Treatment Plant site located just east of the study area and shown on Figure 3-1. CRLFs have

not been previously documented within the study area or in the drainages associated with the study area (Prefumo Creek, San Luis Obispo Creek, and Froom Creeks). Numerous (20+) records for CRLF occur within the Chorro Creek watershed in the vicinity of the San Luis Obispo National Guard Reserve, approximately five miles north of the study area (CNDDB 2006). The closest sightings of red-legged frogs have been reported from a tributary to San Luis Obispo Creek, approximately 7.2 kilometers (4.5 miles) upstream from the study area and within a golfcourse drainage that drains to San Luis Obispo Creek approximately 7.2 kilometers (4.5 miles) downstream from the study area (CNDDB 2006). LSA Associates, Inc. conducted protocol level-surveys for CRLF within Prefumo and San Luis Obispo Creeks, one mile upstream and downstream of from the study area, and within the adjacent water treatment ponds. The surveys were conducted between June 8 and August 10, 2006, according to the *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). A copy of the CRLF BA is provided in Appendix F.

CRLFs were observed within a concrete raceway in the abandoned wastewater treatment plant facilities. The habitat quality of these channels for CRLFs is unknown but the surrounding habitat within the overall treatment facilities appears excellent. The individuals observed in the channel may be dispersing from existing habitat within the treatment facilities. Suitable breeding habitat is present in the northern pond during the rainy season, but very little standing water was observed during the site assessment and within the first week of surveys. The southern pond may provide less suitable habitat since it is mainly open water where a number of bullfrogs *(Rana catesbeiana)* were observed.

The remaining 7 sensitive wildlife species—foothill yellow-legged frog (*Rana boylii*) southwestern pond turtle (*Emys marmorata pallida*), two-striped garter snake (*Thamnophis hammondii*), Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), and western burrowing owl (*Athene cunicularia hypugea*)—have the potential to occur in the study area or may be affected by construction activities. These species are discussed in Chapter 4.

3.2.1.5 Sensitive Fish Species

Based on a review of existing information, two sensitive fish species were identified as having the potential to occur within the project region (Table 3-3). Of the two sensitive fish species listed in Table 3-3, tidewater goby would not occur at the study area because it lacks suitable habitat conditions for the species. The study area is located approximately 12.9 kilometers (8 miles) upstream from San Luis Obispo Bay and the closest CNDDB (2006) record for the species occurs at least 8.0 kilometers (5 miles) downstream from the study area. No tidewater goby have been observed in the San Luis Obispo Creek in the vicinity of the study area during previous fish surveys (Otte pers. comm.). One sensitive fish species—south-central California coast steelhead, is known to occur in the study area and may be affected by construction activities. This species is discussed in Chapter 4.

3.2.1.6 Other Protected Species

Other protected species include migratory birds and raptors and native trees.

Migratory Birds and Raptors

Non-sensitive migratory birds and raptors have the potential to nest in trees and shrubs throughout the study area. Non-special-status migratory birds, including raptors, also have the potential to nest in the study area. Although these species are not considered special-status wildlife species, their occupied nests and eggs are protected by CFGC 3503 and 3503.5 and the Migratory Bird Treaty Act of 1918 (MBTA).

Native Trees

Native trees occur in the study area throughout the Central Coast arroyo willow riparian forest communities. These trees are not mapped individually, but are within the mapped communities presented in Figure 3-1a and 3-1b.

Chapter 4 Results: Biological Resources, Discussion of Impacts and Mitigation

4.1 Natural Communities of Special Concern

The study area supports five natural communities of special concern: Central Coast arroyo willow riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage. Other parts of the study area support common natural communities or are developed, as discussed in Chapter 3. Table 4-1 summarizes the acreages of natural communities of special concern and other common biological communities that would be permanently and temporarily disturbed during construction activities associated with each of the two alternatives.

Table 4-1. Biological Communities Affected in the Study Area

Community Type	Alternative 3		Alternative 6	
	Permanently Affected Hectares (Acres)	Temporarily Affected Hectares (Acres)	Permanently Affected Hectares (Acres)	Temporarily Affected Hectares (Acres)
Central Coast arroyo willow riparian forest[a]	0.16 (0.40)	0.34 (0.84)	0.41 (1.01)	0.2 (0.52)
Seasonal wetland[a, b]	0.01 (0.03)	0 (0)	0.01 (0.02)	0 (0)
Seasonal wetland[a, c]	0.07 (0.17)	0 (0)	0.07 (0.17)	0 (0)
Freshwater marsh[a, b]	0 (0)	0 (0)	0 (0)	0 (0)
Seasonal drainage[a, b]	0.02 (0.04)	0 (0)	0.03 (0.07)	0 (0)
Perennial drainage [a, b]	0.03 (0.07)	0.08 (0.19)	0.06 (0.15)	0.04 (0.11)
Nonnative annual grassland	0.51 (1.26)	0 (0)	0.66 (1.63)	0 (0)
Agricultural	0.06(0.14)	1.97 (4.87)	0.13 (0.31)	1.90 (4.70)
Ruderal	1.31 (3.24)	0.08 (0.20)	2.16 (5.33)	0.12 (0.30)
Developed/landscape	3.77 (9.35)	0.09 (0.23)	5.74 (14.18)	0.02 (0.05)
Total Affected Area	**5.95 (14.70)**	**2.56 (6.33)**	**9.26 (22.87)**	**2.30 (5.68)**

[a] Natural community of special concern.
[b] Jurisdictional waters of the U.S., acreages pending verification by the U.S. Army Corps of Engineers.
[c] Non-jurisdictional wetlands, acreages pending verification by the U.S. Army Corps of Engineers.

4.1.1 Riparian Forest

4.1.1.1 Survey Results

The riparian forest communities in the study area occur along Prefumo Creek and San Luis Obispo Creek west and east of LOVR. One small piece of riparian forest habitat also occurs in the area between U.S. 101 and Calle Joaquin. This community type is multi-layered with trees, small trees and shrubs, and herbaceous layers. Riparian forest vegetation occurs on both banks of the creeks and varies from approximately 23 meters (75 feet) wide on the upstream portion of Prefumo Creek in the study area to approximately 198 meters (650 feet) wide around the confluence of the two creeks.

Riparian forest communities are considered sensitive locally, regionally, and statewide because of their habitat value and decline in extent. CDFG has adopted a no-net-loss policy for riparian forest habitat values, and the Streambed Alteration Agreement (SAA) would include mitigation requirements for loss of riparian forest vegetation. USFWS mitigation policy identifies California's riparian forest habitats in Resource Category 2, for which no net loss of existing habitat value is recommended (46 FR 7644). The riparian forest in the study area is multi-layered, dense, and of a large enough extent to provide high-quality wildlife habitat (for species such as pond turtles and two-striped garter snakes) and function as a vegetation filter that improves the water quality of urban runoff before it enters the creeks.

4.1.1.2 Avoidance and Minimization Measures

Implementation of the following avoidance and minimization measures will ensure that the proposed project minimizes effects on riparian forest habitat within and adjacent to the study area.

Obtain Required Permits, Authorizations, Certifications, and Agreements. Before construction, the City will obtain the following:

- CWA Section 404—NWP #14 and NWP #33 for impacts on jurisdictional wetlands (freshwater marsh) and other waters of the United States (seasonal and perennial drainages)
- CWA Section 401—water quality certification (for impacts on all wetlands and drainages)
- CDFG Section 1602—SAA (for impacts on riparian forest and drainages)
- State Water Resources Control Board—NPDES permit (for grading of more than one acre)
- Biological Opinion from NOAA Fisheries for potential adverse affects on south-central California Coast steelhead
- Biological Opinion from USFWS for potential adverse affects on CRLF

All conditions that are attached to the state and federal permits would be implemented as part of the project. The conditions would be identified clearly in the construction plans and specifications, and monitored during and after construction to ensure compliance.

Measure BIO-1: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources to Be Avoided

The City or its contractor will install orange construction barrier fencing to identify environmentally sensitive areas. A qualified biologist will identify sensitive biological habitat at each bridge site before the final design plans are prepared so that the areas to be fenced can be included in the plans. The area that would generally be required for construction, including staging and access, is shown as the permanent and temporary impact area on Figures 3-1a and 3-1b. Sensitive biological resources that are to be avoided during construction should be fenced off to avoid disturbance. Sensitive biological habitat that occurs adjacent to the construction area includes the creek channels outside the construction zone, wetlands, and any trees that support nests of special-status bird species.

Before construction, the contractor will work with the project engineer and a biological resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites (i.e., riparian vegetation, seasonal wetlands, and trees that support nests of special-status birds) to indicate these locations. The protected areas will be designated as environmentally sensitive areas and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following paragraph will be included in the construction specifications:

> The contractor's attention is directed to the areas designated as "environmentally sensitive areas." These areas are protected, and no entry by the contractor for any purpose will be allowed unless specifically authorized in writing by Caltrans or the City of San Luis Obispo. The contractor will take measures to ensure that contractor's forces do not enter or disturb these areas, including giving written notice to employees and subcontractors. Vehicle operation, material and equipment storage, and other surface-disturbing activities are prohibited within the fenced environmentally sensitive areas.

Temporary fences around the environmentally sensitive areas will be installed as one of the first orders of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as specified in the special provisions, and as directed by the project engineer. The fencing will be commercial-quality woven polypropylene, orange in color, and at least 1.2 meters (4 feet) high (Tensor Polygrid or equivalent). The fencing will be tightly strung on posts set at maximum intervals of 3 meters (10 feet).

Measure BIO-2: Avoid and Minimize Potential Indirect Disturbance of Riparian Forest Communities

To the extent possible, the City will avoid and minimize potential indirect disturbance of riparian forest communities by implementing the following measures:

- The potential for long-term loss of riparian forest vegetation will be minimized by trimming vegetation rather than removing entire shrubs. Shrubs that need to be trimmed will be cut at least 0.3 meter (1 foot) above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary within the construction zone. Cutting will be allowed only for shrubs; all trees will be avoided. Also, cutting will be allowed only in areas that do not provide habitat for sensitive species. To protect nesting birds, pruning or removal of woody riparian forest vegetation will not be allowed between March 1 and August 15.
- A certified arborist will be retained to perform any necessary pruning or root cutting of riparian forest trees.

Work in riparian forest areas will be conducted between June 1 and October 1, and disturbed areas will be stabilized with erosion control measures before October 1.

4.1.1.3 Project Impacts

Construction of the project would result in the permanent loss of riparian forest community within the project footprint. The permanent impact area would include riparian trees, as well as understory plants. Riparian forest vegetation would also be temporarily disturbed during construction. This impact would include the removal and trimming of riparian forest vegetation

during construction of improvements to the northbound and southbound offramps, widening of LOVR, and for creek access to modify culvert structures over the creeks in the study area. The amount of impact on riparian forest differs between the two alternatives, as described below.

Alternative 3: Implementation of Alternative 3 would result in a permanent loss of approximately 0.16 hectare (0.40 acre) of riparian forest and temporary disturbance of approximately 0.34 hectare (0.84 acre) of riparian forest within the study area (Figure 3-1a) during construction of a retaining wall at San Luis Obispo and Prefumo Creeks, construction of the new U.S. 101 southbound off-ramp/LOVR intersection, and widening of the existing LOVR overcrossing at San Luis Obispo Creek.

Alternative 6: Implementation of Alternative 6 would result in a permanent loss of approximately 0.41 hectare (1.01 acres) of riparian forest and temporary disturbance of approximately 0.2 hectare (0.52 acre) of riparian forest within the study area (Figure 3-1b) during construction of a retaining wall at San Luis Obispo and Prefumo Creeks, construction of a new northbound on-ramp and bridge at San Luis Obispo and Prefumo Creeks, widening of the existing LOVR overcrossing at San Luis Obispo and Prefumo Creeks.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of riparian forest habitat. The loss or disturbance of riparian forest vegetation is considered adverse because it provides a variety of important ecological functions, including wildlife habitat and water quality improvement of creeks by filtration of runoff. Removal of vegetation and disturbance due to construction activities would adversely affect the wildlife habitat value and could reduce water quality in the creeks by increasing erosion and sedimentation.

4.1.1.4 Compensatory Mitigation

Measure BIO-3: Replace Temporarily and Permanently Impacted Riparian Forest Vegetation

This mitigation measure replaces both riparian vegetation and shaded riverine aquatic (SRA) cover (a component of riparian vegetation) that is temporarily or permanently lost due to construction; see section 4.4, “Sensitive Fish Species” for a discussion of impacts on SRA cover. SRA cover vegetation is defined as streamside vegetation growing at the interface between the wetted channel and the streambank and includes woody, terrestrial vegetation that extends over the wetted channel and associated tree roots and branches projecting into the water column. Because SRA cover typically is composed of riparian vegetation growing within 4.6 meters (15 feet) (horizontal distance) of the wetted channel, replacement mitigation for construction-related losses of SRA cover necessitates that riparian vegetation plantings occur within 4.6 linear meters (15 linear feet) of the wetted channel in order to be considered mitigation for impacts on SRA cover vegetation. Therefore, to be effective as mitigation for impacts on both riparian vegetation and SRA cover, this measure includes the requirement that riparian vegetation be replanted within 4.6 meters (15 feet) (horizontally) of the wetted channel until a minimum replacement ratio of 2:1 for affected SRA cover vegetation is met. Once the requirement for mitigation for SRA cover vegetation is met, the remainder of riparian vegetation mitigation can be replanted farther away than 4.6 meters (15 feet) from the channel.

For the temporary loss of riparian forest vegetation and SRA cover vegetation at Prefumo and San Luis Obispo Creeks, the City will replace this vegetation at a minimum ratio of 1:1 (1

hectare/acre restored for every 1 hectare/acre temporarily affected) by replanting the temporary access areas with the native species removed, including arroyo willow, California black walnut, black cottonwood, coast live oak, coyote brush, coffeeberry, California blackberry, and elderberry. Replanting at each creek will occur at the earliest opportunity following completion of construction activities and during the time of year when maximum survival of planted vegetation is assured.

For the permanent loss of riparian forest vegetation within and adjacent to the study area along Prefumo and San Luis Obispo Creeks, the City will replace this vegetation at a minimum ratio of 2:1 (2 hectare/acre restored or created for every 1 hectare/acre permanently affected). All permanent riparian impacts will first be mitigated at the treatment ponds adjacent to the study area. While these commitments are made in the environmental document, final locations and quantities for replacement will be confirmed through coordination with state and federal agencies as part of the permitting process and final design phase and will be based on the impacts calculated and presence of appropriate environmental conditions for enhancement or creation. This measure would also include enhancement of the creek corridor through removal of nonnative species such as giant reed, castor bean, poison hemlock, English ivy, Himalayan blackberry, and bigleaf periwinkle and replacing these plants with native riparian trees and shrubs.

With implementation of Alternative 3, 0.66 hectare (1.64 acres) of existing riparian habitat will be enhanced within and adjacent to the study area by removing nonnative species (such as giant reed, castor bean, poison hemlock, English ivy, Himalayan blackberry, and bigleaf periwinkle and replacing these plants with native riparian trees and shrubs) and planting this area with native riparian trees and shrubs (such as arroyo willow, California black walnut, black cottonwood, coast live oak, coyote brush, coffeeberry, California blackberry, elderberry, mugwort, and other readily establishing native riparian forest species). To replace SRA cover vegetation that is *permanently* lost as a result of the project, a minimum of 158 linear meters (520 linear feet) of stream bank would need to be planted with riparian vegetation to meet the minimum 2:1 replacement ratio identified for permanent impacts on SRA cover vegetation. To meet this mitigation requirement, SRA cover vegetation can be planted on either bank. The total bank length replanted must equal at least 158 linear meters (520 feet) or 79 meters (260 feet) of stream length assuming both banks are planted. To replace SRA cover vegetation that is *temporarily* lost, a minimum of 195 meters (640 linear feet) of stream bank would need to be planted to meet the minimum 1:1 replacement ratio.

For Alternative 6, 1.03 hectares (2.54 acres) of existing riparian habitat will be enhanced within and adjacent to the study area (see Figure 3-1b). Enhancement activities for Alternative 6 would include removal of the existing southbound off-ramp onto LOVR (including the culvert across Prefumo Creek) and replanting with native riparian trees and shrubs. To replace SRA cover vegetation that is *permanently* lost as a result of the project, a minimum of 554 linear meters (1820 linear feet) of stream bank would need to be planted with riparian vegetation to meet the minimum 2:1 replacement ratio identified for permanent impacts on SRA cover vegetation. To meet this mitigation requirement, SRA cover vegetation can be planted on either bank. The total bank length replanted must equal at least 277 linear meters (910 feet) or 139 linear meters (455 feet) of stream length assuming both banks are planted. To replace SRA cover vegetation that is

temporarily lost, a minimum of 88 meters (290 linear feet) of stream bank would need to be planted to meet the minimum 1:1 replacement ratio.

The riparian enhancement areas could occur within the study area and the exact location would be determined in coordination with Caltrans and the City. Plantings will consist of cuttings taken from local plants, or plants grown from local material obtained within the Prefumo and San Luis Obispo Creek watersheds. Plantings will be monitored annually for 3 years, or as required in the project permits. A minimum of 75% of the plantings will survive at the end of the monitoring period. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated until the survival criterion is met.

4.1.1.5 Cumulative Impacts

Cumulative impacts on riparian forest vegetation would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project would add to the cumulative loss of riparian forest habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on riparian forest habitats.

4.1.2 Seasonal Wetland

4.1.2.1 Survey Results

Seasonal wetland communities in the study area occur primarily associated with roadside drainages and basins south of LOVR. Two of the areas mapped as seasonal wetland in the study area are located in the northbound on-ramp cloverleaf. One of these wetlands is in the U.S. 101 northbound on-ramp cloverleaf, and one is in the adjacent area between the northbound on- and off-ramps and the highway. These two seasonal wetlands are connected by a culvert under the on-ramp and receive runoff from the adjacent highway. These features appear to be unconnected to any of the creeks in the area, and are likely to be considered non-jurisdictional by the Corps. The wildlife habitat value of these seasonal wetlands is of limited due to their location.

Another mapped location is between the highway and Calle Joaquin where the roadside drainage widens to a basin beneath a billboard. This seasonal wetland receives runoff via the roadside drainage north of the wetland, which widens into a basin where the seasonal wetland and freshwater marsh occur. This feature drains away from Froom Creek and appears to be hydrologically isolated from the creek. This wetland is also likely to be considered non-jurisdictional. The wildlife habitat value of this seasonal wetland is limited due to its location between roads.

These seasonal wetlands are unlikely to be considered jurisdictional by the Corps and would not be subject to regulation under CWA Section 404. Regardless of Corps jurisdiction, however, local, state, and federal agencies recognize seasonal wetlands as sensitive natural communities. In particular, the RWQCB retains jurisdiction over wetlands that are not under Corps jurisdiction.

Several seasonal wetland areas located within the Calle Joaquin realignment project area are potentially under Corps jurisdiction and subject to regulation under Section 404. One of these areas (Drainage 1) is spring fed and enters an underground culvert at its south end that emerges at the confluence with Froom Creek on the west side of Calle Joaquin. Froom Creek crosses under U.S. 101 at this location to its confluence with San Luis Obispo Creek. Drainage 1 supports riparian forest vegetation, dominated by arroyo willow, dogwood, California bay, California blackberry, and cattail. Other seasonal wetlands are located within roadside drainage that crosses from the east side of LOVR to the west side of Calle Joaquin Road (Drainage 2). These roadside wetlands convey runoff from the freshwater marsh and riparian vegetation east of LOVR and from the adjacent roads.

4.1.2.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures described under section 4.1.1, "Riparian Forest," and the following avoidance and minimization measure would ensure that the proposed project minimizes direct and indirect effects on seasonal wetland habitat adjacent to the construction area.

Measure BIO-4: Avoid and Minimize Potential Indirect Disturbance of Seasonal Wetlands near the Construction Area

The City will minimize the potential for indirect disturbance of the seasonal wetlands in the U.S. 101 northbound on-ramp portion of the study area by prohibiting the use of vehicles and equipment staging in this area. All access by vehicle in this portion of the study area will occur via the paved on-ramp.

Measure BIO-5: Protect Water Quality and Prevent Erosion in Wetlands and Drainages

To protect water quality in seasonal wetlands, freshwater marsh, and Prefumo, San Luis Obispo, and Froom Creeks, the City will implement the following BMPs before and during construction:

- All earthwork or foundation activities involving creeks, culverts, and bridges will occur in the dry season (generally between June 1 and October 1).
- All work in the drainages that may contain fish will be limited to the low-flow period in the dry season.
- Equipment used in and around waters of the United States will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance, staging, and materials storage will occur at least 91 meters (300 feet) from all waters of the United States. Any necessary equipment washing will occur where the water cannot flow into the stream channel.
- Any surplus concrete rubble, asphalt, or other rubble from construction will be taken to an approved disposal site.
- An erosion control plan will be prepared and implemented for the proposed project. It will include the following provisions and protocols:
  - Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.

- Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
- Erosion control measures will be applied throughout construction of the proposed project. The SWPPP for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.
- Soil exposure will be minimized through the use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved streets will be swept daily following construction activities.
- The contractor will conduct periodic maintenance of erosion and sediment control measures.
- All temporary erosion and sediment control measures will be removed after the working area is stabilized or as directed by the engineer.
- An appropriate seed mix of native species will be planted on disturbed areas upon completion of construction.
- Sandbagged silt fences will be installed in all named and unnamed waterways in which construction work occurs, both upstream and downstream of the construction site. Any accumulated sediment will be removed and trucked to an approved disposal site.

4.1.2.3 Project Impacts

Alternative 3: Implementation of Alternative 3 would result in the permanent loss of 0.01 hectare (0.03 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the retention basin within the northbound loop onramp.

Alternative 6: Implementation of Alternative 6 would result in the permanent loss of 0.01 hectare (0.02 acre) of potentially jurisdictional seasonal wetlands within Drainage 2 during construction of the southbound onramp and 0.07 hectare (0.17 acre) of non-jurisdictional seasonal wetland during construction of the retention basin within the northbound loop onramp.

With either alternative, indirect impacts on seasonal wetland could occur from adjacent construction activity. Seasonal wetland habitat that is adjacent to the construction area would not be removed for construction, but it could sustain damage from equipment. Implementation of the avoidance and minimization measures would protect seasonal wetlands and avoid this potential impact.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of seasonal wetlands. The loss or disturbance of seasonal wetland is considered adverse because it provides a variety of important ecological functions, including wildlife habitat, floodwater storage, and water quality improvement. The Drainage 2 seasonal wetlands and the two seasonal wetlands within the north-bound off-ramp, however, are of limited

functional value because they are surrounded by roads and have a small watershed defined by the roads.

4.1.2.4 Compensatory Mitigation

Measure BIO-6: Compensate for the Permanent Loss of Seasonal Wetlands

The City will compensate for permanent loss of seasonal wetlands at a minimum ratio of 2:1 (2 hectares/acres restored for every 1 hectare/acre temporarily affected). Permanent impacts on seasonal wetland will first be mitigated on-site in the retention basin. Any remaining seasonal wetland mitigation that cannot be created on-site will be created offsite at an environmentally approved location to be determined, such as the City-owned Johnson Ranch or through the San Luis Land Obispo Conservancy. While these commitments are made in the environmental document, final locations and quantities for compensation will be confirmed through coordination with state and federal agencies as part of the permitting process and final design phase and will be based on the impacts calculated and presence of appropriate environmental conditions for creation.

If Alternative 3 is implemented, total required compensation for impacts on seasonal wetland will be 0.16 hectare (0.40 acre). If Alternative 6 is implemented, total compensation for impacts on seasonal wetlands will be 0.15 hectare (0.36 acre). Because the two of the affected seasonal wetlands occur within artificially created basins between U.S. 101 and the northbound on- and offramps, these wetlands will be restored onsite after the completion of the retention basin construction. To ensure sufficient ponding to support wetland vegetation, the basin north of the on-ramp will be excavated to pre-project conditions and planted with a native seed mix. The basin south of the on-ramp will be excavated to a deeper level for construction of a vegetated retention basin that will provide biofiltration of runoff.

4.1.2.5 Cumulative Impacts

Cumulative impacts on seasonal wetland would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project would add to the cumulative loss of seasonal wetland habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on seasonal wetland habitats.

4.1.3 Freshwater Marsh

4.1.3.1 Survey Results

The study area supports two locations of freshwater marsh community. One freshwater marsh is located within the approved Calle Joaquin realignment project area in Froom Ranch at the base of the Irish Hills. Froom Creek, an ephemeral stream, is approximately 122 meters (400 feet) outside and west of the study area edge and the marsh. The marsh feature is within the floodplain of Froom Creek and is in an area of high ground water (Morro Group, Inc. 2005). This feature has been previously delineated as part of the Calle Joaquin realignment project (Morro Group, Inc. 2004a). Portions of the marsh are perennially wet. Dominant plant species include iris-leaved rush, sedges, creeping leather root, coastal silverweed, bull thistle, birdfoot trefoil, goldentop, and meadow fescue. Dominant plant species in the wettest areas include tule,

iris-leaved rush, seep monkeyflower, and watercress. Most of this marsh is relatively undisturbed and provides high value wildlife habitat, as well as floodwater storage for Froom Creek, groundwater recharge, and filtration of pollutants.

The other freshwater marsh is located between U.S. 101 and Calle Joaquin. This feature appears to be perennial, possibly due to high ground water. This marsh may be hydrologically isolated from Froom Creek, which would make it a non-jurisdictional feature. Dominant species in this community include narrow-leaved cattail, iris-leaved rush, Himalayan blackberry, sneezeweed, and fringed willowherb. This freshwater marsh is confined to a narrow basin between roads and has a lower habitat value than the marsh described above due to the proximity of the highway. This marsh also has limited hydrologic functions, because of its apparent separation from Froom Creek and other streams.

The areas of freshwater marsh within the approved Calle Joaquin realignment project area may be considered jurisdictional by the Corps and therefore subject to regulation under CWA Section 404. The marsh between U.S. 101 and Calle Joaquin is likely to be non-jurisdictional. Regardless of Corps jurisdiction, however, local, state, and federal agencies recognize freshwater marshes as sensitive natural communities.

4.1.3.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures described under section 4.1.1, “Riparian Forest,” section 4.1.3, “Seasonal Wetland,” and the following measure would ensure that the proposed project minimizes direct and indirect effects on freshwater marsh habitat adjacent to the construction area.

Measure BIO-7: Avoid and Minimize Potential Indirect Disturbance of Freshwater Marsh near the Construction Area

The City will minimize the potential for indirect disturbance of the freshwater marsh in the Calle Joaquin/U.S. 101 southbound on-ramp and off-ramp portion of the study area by prohibiting equipment staging in this area. All access by vehicle in this portion of the study area will be limited to the project right-of-way.

4.1.3.3 Project Impacts

Alternative 3: Freshwater marsh habitat is outside of the proposed construction zone for Alternative 3. Construction of Alternative 3, therefore, would avoid direct and indirect impacts on freshwater marsh.

Alternative 6: Based on the extent of habitat shown in Figure 3.1-b, implementation of Alternative 6 would avoid any direct impacts on freshwater marsh within the project footprint for the Calle Joaquin/U.S. 101 southbound on-ramp and off-ramp. It is likely that construction of the Calle Joaquin Road realignment project (Figure 3-1b) has removed the freshwater marsh area near proposed project construction since the field surveys were conducted. If any freshwater marsh habitat remains adjacent to the study area at the time of project construction, Alternative 6 could result in indirect impacts on freshwater marsh from adjacent construction activity. Implementation of the avoidance and minimization measures would protect freshwater marsh and avoid this potential impact. No additional mitigation is proposed for freshwater marsh habitat.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of freshwater marsh. The loss or disturbance of freshwater marsh is considered adverse because it provides ecological functions, including wildlife habitat, floodwater storage for Froom Creek, groundwater recharge, and filtration of pollutants.

4.1.3.4 Cumulative Impacts

Cumulative impacts on freshwater marsh would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project could add to the cumulative loss of freshwater marsh habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on freshwater marsh habitats.

4.1.4 Seasonal Drainage

4.1.4.1 Survey Results

Several seasonal drainages traverse the study area, including Froom Creek and several unnamed seasonal drainages along roadsides. Froom Creek, an intermittent stream in the study area with a perennial reach upstream, drains to San Luis Obispo Creek from an underground culvert beneath U.S. 101. Froom Creek supports riparian forest vegetation where it crosses the study area and a combination of eucalyptus and riparian vegetation up to approximately 300 meters (1,000 feet) upstream, but is mostly unvegetated in the area further upstream.

Two seasonal drainages have been previously evaluated in a wetland delineation for the Calle Joaquin realignment project, and are referred to as Drainage 1 and Drainage 2 in that delineation (Morro Group, Inc. 2004a). Drainage 1 is mapped as seasonal wetland and is described above. Drainage 2 parallels LOVR and U.S. 101 and is fed by urban runoff. The north portion of Drainage 2 in the study area floods into the adjacent freshwater marsh under high flow conditions. The southern end of Drainage 2 enters a culvert and drains to Froom Creek. The northern portion of Drainage 2 supports riparian forest vegetation, including arroyo willow, poison hemlock, sweet fennel, teasel, and milk thistle. The southern portion along Calle Joaquin supports scattered arroyo willow and eucalyptus, coyote brush, poison hemlock, a small area of bulrush and cattail, and ruderal herbaceous species. Portions of this drainage are mapped as seasonal wetland, described above.

The study area also includes a seasonal drainage that parallels U.S. 101 and is separated from the southern end of Drainage 2 by a stand of eucalyptus. This drainage flows south and expands into a seasonal wetland in a basin area between U.S. 101 and Calle Joaquin. This drainage does not appear to connect to any of the other drainages in the study area. The lowest point of the basin supports freshwater marsh that appears to be perennial, and then continues to another segment of seasonal drainage at the southernmost part of the study area. The upstream portion of this seasonal drainage is dominated by coyote brush, California blackberry, poison hemlock, and mugwort. The southernmost end of the drainage supports arroyo willow riparian, with some nonnatives, such as pepper tree.

A small segment of seasonal drainage lies between LOVR and the southbound on-ramp to U.S. 101. This feature is similar to Drainage 2 and is fed by runoff from the surrounding roads. A culvert connects this seasonal drainage to a patch of creeping wildrye surrounded by ruderal vegetation in a island between LOVR, Calle Joaquin, and a dirt road, but does not appear to connect to any other drainages in the study area. The drainage supports a ruderal understory with several trees, including willow, eucalyptus, and pepper tree.

Froom Creek is a water of the United States and is shown as a blue-line stream on the USGS quadrangle. Drainages 1 and 2 would likely be considered jurisdictional by the Corps, because they drain to Froom Creek, a water of the United States. The other two seasonal drainages in the study area appear to function only as roadside ditches that are isolated from other drainages and would likely be considered non-jurisdictional by the Corps. Froom Creek and Drainages 1 and 2 provide wildlife habitat, particularly during the wet season. The non-jurisidictional drainages provide a lower quality wildlife habitat due to the proximity of roads and lack of connection to other drainages.

4.1.4.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures described under section 4.1.1, “Riparian Forest,” section 4.1.3, “Seasonal Wetland,” and the following measure would ensure that the proposed project minimizes direct and indirect effects on seasonal drainage habitat adjacent to the construction area.

Measure BIO-8: Avoid and Minimize Potential Indirect Disturbance of Seasonal Drainage near the Construction Area

The City will minimize the potential for indirect disturbance of the seasonal drainages in the realigned portion of the Calle Joaquin/U.S. 101 southbound on-ramp under Alternative 3 or the Calle Joaquin/U.S. 101 southbound on-ramp and off-ramp under Alternative 6 by prohibiting equipment staging in this area. All access by vehicle in this portion of the study area will be limited to the project right-of-way.

4.1.4.3 Project Impacts

Construction of the project would result in the permanent loss of seasonal drainage within Drainage 2. The permanent impact area would include loss of wetland vegetation. Temporary impacts on seasonal drainage would occur due to removal of vegetation and disruption of the drainage during construction activities in the right-of-way. No impacts on other seasonal drainages, including Froom Creek, are anticipated. The amount of impact on Drainage 2 differs between the two alternatives, as described below.

Alternative 3: Implementation of Alternative 3 would result in permanent loss of 0.02 hectare (0.04 acre) of seasonal drainage for the reconstruction of the existing Calle Joaquin/U.S. 101 southbound on-ramp where it connects to the widened LOVR (Figure 3-1a).

Alternative 6: Implementation of Alternative 6 would result in a permanent loss of approximately 0.03 hectare (0.07 acre) of seasonal drainage within the project footprint for the reconstruction of the existing Calle Joaquin/U.S. 101 southbound on-ramp where it connects to the widened LOVR (Figure 3-1b).

With either alternative, indirect impacts on seasonal drainage could occur from adjacent construction activity. Seasonal drainage vegetation that is adjacent to the construction area would not be removed for construction, but it could sustain damage from equipment. Implementation of the avoidance and minimization measures would protect vegetation and avoid this potential impact.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of seasonal drainages. The loss or disturbance of seasonal drainages is considered adverse because it provides important ecological functions, including wildlife habitat and floodwater conveyance.

4.1.4.4 Compensatory Mitigation

Measure BIO-9: Compensate for Permanent Loss of Seasonal Drainage Habitat

The City will compensate for the permanent fill of seasonal drainage (a direct impact associated with new road construction) at a minimum ratio of 2:1 (2 hectares/acres restored or created for every 1 hectare/acre permanently affected).

- Under Alternative 3, a minimum of 0.03 hectare (0.08 acre) of compensation for permanent loss of seasonal drainage will be required.
- Under Alternative 6, a minimum of 0.03 hectare (0.07 acre) of compensation for the permanent loss seasonal drainage will be required.

Permanent impacts on seasonal drainage habitat will first be mitigated on-site. Any remaining mitigation that cannot be created on-site will be created offsite at an environmentally approved location to be determined, such as the City-owned Johnson Ranch or through the San Luis Land Obispo Conservancy. On-site compensation will be accomplished by restoring and/or enhancing riparian and in-stream habitats along Prefumo and San Luis Obispo Creeks in the study area. Compensation for other waters of the United States will be in addition to and will follow the guidelines for riparian habitat compensation described under section 4.1.1, “Riparian Forest”. Permanent impacts to seasonal drainages that cannot be mitigated on-site will be compensated at a 2:1 ratio offsite through creation of habitat.

Temporarily disturbed portions of the drainages will be returned to original grade following construction, and will result in no permanent impacts.

4.1.4.5 Cumulative Impacts

Cumulative impacts on seasonal drainage would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project would add to the cumulative loss of seasonal drainage habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on seasonal drainage habitats.

4.1.5 Perennial Drainage

4.1.5.1 Survey Results

Two perennial drainages cross the study area, Prefumo Creek and San Luis Obispo Creek. The perennial drainages cross study area roadways via cement box culverts of varying sizes. Dense riparian forest vegetation borders both creeks throughout the study area, as described above in section 4.1.1.1.

Prefumo Creek and San Luis Obispo Creek are waters of the United States and are shown as blue-line streams on the USGS quadrangle. Local, state, and federal agencies recognize perennial drainages as sensitive natural communities. These creeks are important wildlife corridors within an urbanizing area and provide habitat for native fish species.

4.1.5.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures described under section 4.1.1, "Riparian Forest"; section 4.1.3, "Seasonal Wetland"; and the following measure would ensure that the proposed project minimizes direct and indirect effects on perennial drainage habitat adjacent to the construction area.

Measure BIO-10: Avoid and Minimize Potential Indirect Disturbance of Perennial Drainage near the Construction Area

The City will minimize the potential for indirect disturbance of the perennial drainages, including Prefumo and San Luis Obispo Creeks, in the project area by prohibiting equipment staging in these areas. All access by vehicle in these portions of the study area will be limited to the project right-of-way.

4.1.5.3 Project Impacts

Construction of the project would result in the permanent loss of perennial drainage within Prefumo and San Luis Obispo Creeks. The permanent impact area would include loss of riparian and wetland vegetation. Temporary impacts on perennial drainages would occur due to removal of vegetation and disruption of the drainages during construction activities in the right-of-way. The amount of impact on the creeks differs between the two alternatives, as described below.

Alternative 3: Implementation of Alternative 3 would result in a permanent loss of approximately 0.03 hectare (0.07 acre) of perennial drainage and temporary disturbance of approximately 0.08 hectare (0.19 acre) of perennial drainage for the construction of a retaining wall at San Luis Obispo Creek, and the widening of the existing LOVR overcrossing at Prefumo Creek and San Luis Obispo Creek (Figure 3-1a).

Alternative 6: Implementation of Alternative 6 would result in a permanent loss of approximately 0.06 hectare (0.15 acre) of perennial drainage and temporary disturbance of approximately 0.04 hectare (0.11 acre) of perennial drainage for the construction of a retaining wall at San Luis Obispo Creek, construction of a new northbound on-ramp and bridge at San Luis Obispo and Prefumo Creeks, and the widening of the existing LOVR overcrossing at San Luis Obispo Creek (Figure 3-1b).

With either alternative, indirect impacts on perennial drainage could occur from adjacent construction activity. Vegetation that is adjacent to the construction area would not be removed for construction, but it could sustain damage from equipment. Implementation of the avoidance and minimization measures would protect vegetation and avoid this potential impact.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of perennial drainages. The loss or disturbance of these perennial drainages is considered adverse because they provides a variety of important ecological functions and values, including fish and wildlife habitat, conveyance of floodwater, and aesthetic values within an urban area.

4.1.5.4 Compensatory Mitigation

Measure BIO-11: Compensate for Permanent Loss and Temporary Disturbance of Perennial Drainage Habitat

The City will compensate for temporary construction-related loss of perennial drainage at a minimum ratio of 1:1 (1 hectare/acre restored for every 1 hectare/acre temporarily affected) and will compensate for the permanent fill of perennial drainage (a direct impact associated with new road construction) in Prefumo and San Luis Obispo Creeks at a minimum ratio of 2:1 (2 hectares/acres restored or created for every 1 hectare/acre permanently affected).

- Under Alternative 3, a minimum of 0.13 hectare (0.33 acre) of compensation for loss of perennial drainage will be required.
- Under Alternative 6, a minimum of 0.17 hectare (0.41 acre) of compensation for the loss of perennial drainage will be required.

Permanent impacts on perennial drainage habitat will first be mitigated on-site. Any remaining mitigation that cannot be created on-site will be created offsite at an environmentally approved location to be determined, such as the City-owned Johnson Ranch or through the San Luis Land Obispo Conservancy. On-site compensation will be accomplished by restoring and/or enhancing riparian and in-stream habitats along Prefumo and San Luis Obispo Creeks in the study area. Compensation for other waters of the United States will be in addition to and will follow the guidelines for riparian habitat compensation described under section 4.1.1.2, “Riparian Forest”. Permanent impacts to seasonal drainages that cannot be mitigated on-site will be compensated at a 2:1 ratio offsite through creation of habitat. .

Temporarily disturbed portions of the drainages will be returned to original grade following construction, and will result in no permanent impacts.

4.1.5.5 Cumulative Impacts

Cumulative impacts on perennial drainage would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project would add to the cumulative loss of perennial drainage habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on perennial drainage habitats.

4.2 Sensitive Plant Species

As described in Chapter 2, sensitive species that could potentially occur in the study area were identified based on a review of existing information, coordination with agency personnel, and a reconnaissance-level field survey. Table 3-2 lists all sensitive plant species that were identified during the prefield investigation with the potential to occur in the project region.

No sensitive plants have been previously recorded in the study area (California Natural Diversity Database 2006; Morro Group, Inc. 2004b). Spring and summer botanical surveys were conducted in May and July 2006 in the study area. No sensitive plants were found during the survey, and the botanist determined that the study area was unlikely to support sensitive plant species based on the level of previous and ongoing disturbance. Therefore, it is not anticipated that sensitive plants would be affected by construction activities.

Since botanical surveys were conducted ten days past the general blooming period for one of the species, rayless ragwort (*Senecia aphanactus*), an impact is identified for this species, as described below.

4.2.1 Rayless Ragwort

Rayless ragwort (*Senecio aphanactis*), also known as chaparral ragwort, is an annual herb in the sunflower family (Asteraceae). This species blooms from January to April and grows in chaparral, woodland, and coastal scrub habitats. It often occurs on alkaline substrates, but also on clay, coarse sand, and rock outcrops, including serpentinite. (CNPS 2008; Madroño 2000). All herbarium specimen occurrences grew in unvegetated areas (Madroño 2000). Rayless ragwort is a CNPS List 2.2 species, which includes species that are fairly endangered in California, but more common elsewhere (CNPS 2008). This species is not known from disturbed habitats. It has been collected in the California Coast Ranges south of San Francisco Bay; the Transverse Ranges, southwest California, Santa Cruz Island, and Baja California. The CNDDB includes 35 recorded occurrences of this species, 5 of which are in San Luis Obispo County. Four of the county's occurrences are 40 or more years old, with only approximate information on the site location. These four occurrences were on gravel slopes or serpentine rocks. The fifth occurrence in the County is on a serpentine slope on Camp San Luis Obispo, approximately 8 miles northwest of the study area (CNDDB 2007). Threats to this species include grazing, non-native plants, military training activities, improper burning regime, and feral pigs.

4.2.1.1 Survey Results

Botanical surveys were conducted on May 10 and 11, ten days past the general blooming period for rayless ragwort (*Senecia aphanactus*). At the time of the survey, fruits, if not flowers, of the ragwort would have been evident and allowed for identification at least to the genus level. Only *Senecio vulgaris* was observed in the study area during these surveys.

4.2.1.2 Project Impacts

Although botanical surveys were conducted in May, which is after this species blooming period, no suitable habitat for the species was observed in the study area. This species grows in undisturbed areas with little or no competition with other plants. Based on the lack of habitat in

the project impact area that is likely to be suitable for rayless ragwort, there is a low probability of this species occurring in the study area. Therefore, potential impacts on rayless ragwort are considered less than significant and no mitigation is proposed.

4.3 Sensitive Wildlife Species

As described in Chapter 2, sensitive species that could potentially occur in the study area were identified based on a review of existing information, coordination with agency personnel, and reconnaissance-level field surveys. Table 3-3 lists all sensitive wildlife species that were identified during the prefield investigation with the potential to occur in the project region. After biological field surveys (including CRLF protocol-surveys) were conducted and additional information was obtained from the resource agencies, the biologist determined that the following sensitive wildlife species (listed in Table 4-2) could occur in the study area or may be affected by construction activities.

4.3.1 California Red-Legged Frog

CRLF is federally listed as threatened and a state species of special concern, and is known to occur in central coast watersheds from Point Reyes National Seashore south to Baja California. Historically, CRLF occurred within the Sierra Nevada foothills and the Central Valley; however, due to habitat disturbance and exotic predator introduction, CRLF has experienced a 70 percent reduction in its geographic range (Jennings, Bradford, and Johnson 1992). Counties that support the greatest number of occupied drainages include Monterey, San Luis Obispo, and Santa Barbara (USFWS Federal Register 1996).

CRLF require specific habitat characteristics for breeding and upland habitat. Breeding habitat is characterized by still to slow moving water containing emergent vegetation. Breeding occurs following large rain events between the months of November and March. Reddish brown egg masses are laid on emergent vegetation and float at the surface of the water. Upland habitat is necessary for the survival of this species and includes small mammal burrows, leaf litter, downed trees, and dense riparian vegetation. CRLF are generally found in riparian vegetation within 30 meters (100 feet) of a water source, but can move up to two miles between aquatic sites to escape drying areas, forage, or breed (USFWS Federal Register 1996).

4.3.1.1 Survey Results

No CRLF were observed in San Luis Obispo, Prefumo, or Froom Creeks. However, two CRLFs, one juvenile and one adult, were observed during nighttime, non-breeding season surveys at the abandoned wastewater facilities during the last night of the survey effort. Numerous bullfrogs, up to 13, were also noted in the treatment plant area at the time of the surveys (Appendix F). During the surveys, vagrant encampments were observed along San Luis Obispo and Prefumo Creeks. Encampments included tent sites, vegetable plantings, and laundry washing within the creek. Human waste was also observed on occasion within the stream channels. In addition, both creeks contained a large amount of urban debris and trash.

There are no recent or historical records in the CNDDB for CRLF within the Froom Creek watershed and CRLF were not noted during recent surveys (Morro Group 2004b). Although

there is the lack of historical recorded observations, two individual CRLF were observed during the last survey event in the raceways adjacent to the project area. No egg masses were observed in the wastewater treatment ponds; however, CRLF may use the treatment ponds as breeding habitat. The northern treatment pond contains emergent vegetation and seasonal water and could provide potential breeding habitat. No CRLF were observed within San Luis Obispo and Prefumo Creeks and due to the channelized nature of these drainages, they most likely do not provide suitable breeding habitat. However, because these drainages carry water through most of the year they may serve as foraging habitat, summer habitat, or as dispersal corridors.

4.3.1.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures, described under sections 4.1.1, "Riparian Forest", 4.1.5 "Seasonal Drainage", "4.1.6 Perennial Drainage" and, 4.4.1 "South-Central California Coast Steelhead" (Measures BIO-17, BIO-18, and BIO-24) would reduce project related impacts to this species. In addition, a series of specific avoidance and minimization measures developed within the Programmatic Biological Opinion for Projects Funded or Approved under the Federal Aid Program [HAD-CA, File #: Section 7 within the Ventura U.S. Fish and Wildlife Service (USFWS), Document 3: S38192] (1-8-02-F-68) would be implemented. Avoidance and minimization measures included within the Programmatic Biological Opinion (2003) for this species have also been incorporated into the project design and are listed below:

1. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of CRLF.
2. Ground disturbance will not begin until written approval is received from the USFWS that the biologist is qualified to conduct the work.
3. Only USFWS-approved biologists will survey aquatic and riparian areas at the project site 48 hours before the onset of work activities. If any life stage of the CRLF is found and these individuals are likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move them from the site before work activities begin. The USFWS-approved biologist will relocate the CRLF the shortest distance possible to a location that contains suitable habitat and will not be affected by the activities associated with the proposed project. The USFWS-approved biologist will maintain detailed records of any individuals that are moved (e.g. size, coloration, any distinguishing features, photographs) to assist him or her in determining whether translocated animals are returning to the original point of capture.
4. Before any activities begin on the project, a USFWS-approved biologist will conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and its habitat, the specific measure that are being implemented to conserve the CRLF for the current project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session, provided that a qualified person is on hand to answer any question.
5. A USFWS-approved biologist will be present at the work site until all CRLF are removed, workers have been instructed, and disturbance of habitat is completed. After this time, the state or local sponsoring agency will designate a person to monitor on-site compliance with all minimization measures. The USFWS approved biologist will ensure that this monitor

Table 4-2. Sensitive Wildlife and Fish Species Potentially Occurring in the Study Area

Common Name, *Scientific Name*	Legal Status[a]		Habitat Requirements	Species Present in Study Area?	Specific Habitat Present in Study Area?	Rationale
	Federal	State				
Central California Coast Steelhead *Oncorhynchus mykiss*	T	–	Requires silt free gravel for spawning. Juveniles require cool water, refuge cover, and sufficient dissolved oxygen.	Yes	Yes	Species has been documented within San Luis Obispo and Prefumo Creeks in the study area.
California red-legged frog *Rana aurora draytonii*	T	SSC	Permanent and semi-permanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	Not observed	Yes	Within the study area, suitable habitat is present within Prefumo Creek and San Luis Obispo Creek and within the adjacent wastewater treatment ponds. Several CRLF were observed in wastewater treatment facility during protocol surveys (see Appendix F).
Foothill yellow-legged frog *Rana boylii*	–	SSC	Creeks or rivers in woodlands or forests with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby	Not observed	Yes	No foothill yellow-legged frogs were observed during protocol-level surveys for California red-legged frog
Southwestern pond turtle *Emys marmorata pallida*	–	SSC	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests. Overwintering habitat consists of mud in stream and pond bottoms or a variety of upland habitats including riparian habitat. Eggs are laid in earthen cavities, usually in sunny locations within 1,640 feet of aquatic habitat.	Yes	Yes	Suitable aquatic habitat for southwestern pond turtles is present within Prefumo and San Luis Obispo Creeks in the study area. One adult pond turtle was observed in Prefumo Creek near the confluence with San Luis Obispo Creek in the study area during the April 2006 field surveys.
Two-striped garter snake *Thamnophis hammondii*	–	SSC	Perennial and intermittent streams having rocky beds bordered by willow thickets or other dense vegetation. Also inhabits large sandy riverbeds, such as the Santa Clara river, if a strip of riparian vegetation is present, and stock ponds if riparian vegetation and fish and amphibian prey are present	Not observed	Yes	San Luis Obispo and Prefumo Creeks in the study area provides potential habitat for the species. The species is known to occur in San Luis Obispo County (CNDDB 2006).

Table 4-2. Continued

Common Name, *Scientific Name*	Legal Status[a]		Habitat Requirements	Species Present in Study Area?	Specific Habitat Present in Study Area?	Rationale
	Federal	State				
Cooper's hawk *Accipiter cooperii*	–	SSC	Nests primarily in riparian forests dominated by deciduous species; also nests in densely canopied forests from grey pine–oak woodland up to ponderosa pine; forages in open woodlands	Not observed	Yes	Species was not observed during reconnaissance-level fields surveys conducted between April and July 2006. Riparian forest in the study area provides suitable nesting and wintering habitat for the species.
Northern harrier *Circus cyaneus*	–	SSC	Grasslands, meadows, marshes, and seasonal and agricultural wetlands.	Not observed	Yes	Species was not observed during reconnaissance-level fields surveys conducted between April and July 2006. Emergent marsh in the study area provides suitable nesting habitat for the species.
White-tailed kite *Elanus leucurus*	–	FP	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Not observed	Yes	Species was not observed during reconnaissance-level fields surveys conducted between April and July 2006. Riparian forest in the study area provides suitable nesting and wintering habitat for the species.
Western burrowing owl *Athene cunicularia hypugea*	–	SSC	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows.	Not observed	Yes	Species was not observed during reconnaissance-level fields surveys conducted between April and July 2006. Annual grasslands with active ground squirrel burrows in the study area provide suitable nesting and wintering habitat for the species.

[a] Status explanations:

– = no listing.

Federal

T = listed as threatened under the federal Endangered Species Act.

State

FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.

receives the training outlined in measure 4 and in the identification of CRLF. If the monitor or the approved biologist recommends that work be stopped because CRLF have would be affected to a degree that exceeds the levels anticipated by USFWS during review of the proposed action, they will notify the resident engineer (the engineer that is directly overseeing and in command of construction activities) immediately. The resident engineer will either resolve the situation by eliminating the effect immediately or required that all action which is causing these effects be halted. If work is stopped, the USFWS will be notified as soon as is reasonably possible.

6. During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
7. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 feet from riparian habitat or water bodies and preferably, not in a location from where a spill would drain directly toward aquatic habitat. The monitor will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, the City will ensure that a plan is in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
8. Project sites will be revegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area. Locally collected plant materials will be used to the extent practicable. Invasive, exotic plant will be controlled to the maximum extent practicable. This measure will be implemented in all areas disturbed by activities associated with the project, unless USFWS and the City determine that that it is not feasible or practicable. (For example, an area disturbed by construction that would be used for future activities need not be revegetated.)
9. Habitat contours will be returned to their original configuration at the end of project activities. This measure will be implemented in all areas disturbed by activities associated with the project, unless USFWS and the City determine that it is not feasible or modification of original contours would benefit the CRLF.
10. The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction, and minimize the impact to CRLF habitat; this goal includes locating access routes and construction areas outside of wetlands and riparian areas to the maximum extent practicable.
11. The City will attempt to schedule work activities for times of the year when impacts to CRLF would be minimal. For example, work that would affect large pools that may support breeding would be avoided, to the maximum degree practicable, during the breeding season (November through May). Isolated pools that are important to maintain CRLF through the driest portions of the year would be avoided, to the maximum degree practicable, during the late summer and early fall. Habitat assessments, surveys, and informal, consultation between the City and USFWS during project planning should be used to assist in scheduling work activities to avoid sensitive habitats during key times of the year.

12. To control sedimentation during and after project implementation, the City will implement best management practices outlined in any authorizations or permits, issued under the authorities of the Clean Water Act that it receives for the specific project. If best management practices are ineffective, the City will attempt to remedy the situation immediately, in consultation with the Service if a work site is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 0.2 inch to prevent CRLF from entering the pump system. Water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. The methods and materials used in any dewatering will be determined by the City in consultation with USFWS on site-specific basis. Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate. Alteration of the stream bed will be minimized to the maximum extent possible; any imported material will be removed from the stream bed upon completion of the project.
13. Unless approved by USFWS, water will not be impounded in a manner that may attract CRLF.
14. A USFWS-approved biologist will permanently remove any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes from the project area, to the maximum extent possible. The USFWS approved biologist will be responsible for ensuring his or her activities are in compliance with the California Fish and Game Code.
15. To ensure that diseases are not conveyed between work sites by the USFWS approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.

4.3.1.3 Project Impacts

The proposed project would not impact any potential CRLF breeding habitat, but may impact potential foraging habitat and aquatic dispersal/summer habitat.. Direct impacts would include dewatering of aquatic habitat and clearing riparian vegetation, which would result in permanent and temporary loss of potential foraging and dispersal/summer habitat. In addition, construction activities including the use of heavy equipment in riparian habitat, dust, noise, and lighting may adversely impact foraging or dispersing CRLF. Although construction in the stream channel would be conducted outside of the rainy season, CRLF using San Luis Obispo or Prefumo Creeks as summer habitat or as dispersal corridors may be adversely impacted. No suitable upland habitat is present in the study area; therefore no impacts would occur to upland habitat. Although the nature of potential impacts on CRLF would be the same under both Alternative 3 and Alternative 6, the amount of habitat impacted would be different. The differences in impacts of foraging and dispersal/summer habitat between Alternatives 3 and 6 are described below.

Alternative 3. Implementation of Alternative 3 would result in a permanent loss of approximately 0.16 hectare (0.40 acre) and temporary disturbance of approximately 0.34 hectare (0.84 acre) of potential foraging habitat (riparian forest) within the study area (Figure 3-1a). This alternative would also result in a permanent loss of approximately 0.04 hectare (0.11 acre) and temporary disturbance of approximately 0.08 hectare (0.19 acre) of aquatic dispersal/summer habitat for CRLF.

Alternative 6. Implementation of Alternative 6 would result in a permanent loss of approximately 0.41 hectare (1.01 acres) and temporary disturbance of approximately 0.2 hectare (0.52 acre) of potential foraging habitat (riparian forest) within the study area (Figure 3-1a). This alternative would also result in a permanent loss of approximately 0.09 hectare (0.22 acre) and temporary disturbance of approximately 0.04 hectare (0.11 acre) of aquatic dispersal habitat for CRLF.

4.3.1.4 Compensatory Mitigation

No compensatory mitigation for California red-legged frog is recommended. Avoidance and minimization measures included within the Programmatic Biological Opinion (2003) for this species have also been incorporated into the project design.

On-site mitigation will be implemented to the extent possible. Any remaining impacts that cannot be mitigated on-site will be mitigated at a currently undetermined environmentally-approved off-site location, such as the City-owned Johnson Ranch or through the San Luis Land Obispo Conservancy.

4.3.1.5 Cumulative Impacts

Cumulative impacts on CRLF would result from construction of other general development projects in San Luis Obispo County. Project-related impacts on CRLF will be avoided and minimized during and after project construction. Therefore, no cumulative impacts on CRLF are anticipated.

4.3.2 Foothill Yellow-Legged Frog

Foothill yellow-legged frog is designated as a state species of special concern. Historically, foothill yellow-legged frogs occurred in the coastal foothills and mountains from the Oregon border south to Los Angeles County and in the Sierra Nevada foothills south to Kern County (Zweifel 1955, Stebbins 2003). The current range excludes coastal areas south of northern San Luis Obispo County and foothill areas south of Fresno County where the species is apparently extirpated (Jennings and Hayes 1994). The species can occur from sea level to 1,829 meters (6,000 feet)(Stebbins 2003).

Foothill yellow-legged frogs occupy rocky streams in valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types of habitat (Zeiner et al. 1988). The species is most common along streams with rocky bottoms but has also been found along streams with mud bottoms (Stebbins 1951). They require permanent streams or at a minimum, streams where pools persist throughout the dry season (Stebbins 1951). Foothill yellow-legged frogs are active from late February or early March through summer and into the fall (Zweifel 1955). The species breeds from mid-March to May after the high-water stage in streams has passed and less sediment is being conveyed (Stebbins 1954).

4.3.2.1 Survey Results

Foothill yellow-legged frogs were reported just west of the study area in 1987 (Holland et al 1988), although Caltrans believes that the frog(s) were misidentified CRLF (Hacker pers.

comm.). Foothill yellow-legged frogs were not observed during reconnaissance-level field surveys or during protocol-level surveys for CRLF conducted within Prefumo and San Luis Obispo Creeks within the study area. Prefumo and San Luis Obispo Creeks in the study area provide suitable habitat for this species.

4.3.2.2 Avoidance and Minimization Measures

Implementation of the avoidance and minimization measures for California red-legged frog described above and Measure BIO-12 below would avoid and minimize potential project impacts on foothill yellow-legged frogs.

Measure BIO-12: Install Fencing and Monitor Dewatering Activities within the Construction Work Area and Relocate Sensitive Aquatic Wildlife, if Necessary

To avoid construction-related impacts on foothill yellow-legged frog, southwestern pond turtles, and two-striped garter snakes during work within Prefumo and San Luis Obispo Creeks, fences will be constructed upstream and downstream of the dewatering area to prevent these species from entering the construction area. The fences will be constructed at the edges of or just outside of the area to be dewatered. The fences will be perpendicular to the creek and will extend 100 feet out from the center of the creek on each side. The City shall retain a qualified wildlife biologist to monitor fence installation and dewatering activities associated with installation of cofferdams or water-diversion structures within Prefumo and San Luis Obispo Creeks. Prior to dewatering, the area will be surveyed for all lifestages of foothill yellow-legged frog, southwestern pond turtle, and two-striped garter snake and the biologist will relocate any individuals found to the outside of the barrier fences in suitable habitat at least 300 feet from the construction area. In addition, if a foothill yellow legged-frog, southwestern pond turtle, or two-striped garter snake becomes entrapped in an area being dewatered or diverted, the biologist will assist the contractor in providing means for the animal to voluntarily move out of the construction area or the biologist will actively relocate the animal to an area outside the barrier fences. The biologist will have a valid scientific collecting permit as well as authorization from DFG to relocate these three California species of special concern.

4.3.2.3 Project Impacts

The proposed project may impact potential breeding and dispersal habitat for foothill yellow-legged frog. If they are present in the creek channel or along the creek bank during construction, they could be injured or killed by construction activities or personnel. In addition, dewatering of aquatic habitat during the period when eggs or larvae are developing could result in the loss of individuals. Although construction in the stream channel would be conducted outside a portion of the breeding season, tadpoles could still be present within the channel through the summer if foothill yellow-legged frogs bred in San Luis Obispo or Prefumo Creeks. The nature of potential impacts on foothill yellow-legged frog would be the same under both Alternative 3 and Alternative 6. Implementation of the avoidance and minimization measure described above would ensure that the proposed project would not result in the injury or mortality of foothill yellow-legged frogs.

4.3.2.4 Compensatory Mitigation

No compensatory mitigation for foothill yellow-legged frog is recommended.

4.3.2.5 Cumulative Impacts

Impacts on foothill yellow-legged will be avoided and minimized during project construction. No cumulative impacts on the species are anticipated.

4.3.3 Southwestern Pond Turtle

Southwestern pond turtle is designated as a state species of special concern. Southwestern pond turtle, one of two subspecies of western pond turtle, occurs along the central coast of California east to the Sierra Nevada and along the southern California coast inland to the Mojave and Sonora Deserts (Jennings et al. 1992).

Western pond turtles are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 1985). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Western pond turtles spend considerable time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris. They move up to 396 meters (1,300 feet) or more to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Southwestern pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992).

4.3.3.1 Survey Results

Within the study area, a southwestern pond turtle was observed in Prefumo Creek, near its confluence with San Luis Obispo Creek, during the 2006 field surveys. Prefumo and San Luis Obispos Creeks in the study area provide suitable aquatic habitat for the species. Adjacent uplands in the study area occur within heavily disturbed urban areas in the city of San Luis Obispo and do not provide suitable nesting and overwintering habitat.

4.3.3.2 Avoidance and Minimization Measures

Implementation of the avoidance and minimization measure described above under sections 4.1.1, “Riparian Forest” and 4.3.2, “Foothill Yellow-Legged Frog” would minimize potential project impacts on southwestern pond turtle.

4.3.3.3 Project Impacts

Suitable upland habitat for pond turtles is not present within the study area; however, Prefumo and San Luis Obispo Creeks in the study area provide suitable aquatic habitat and basking sites for the species, and turtles may use riparian areas along these creeks as well. Southwestern pond turtles are very sensitive to disturbances and quickly retreat into the water when threatened. If pond turtles are present in the creek channel or along the creek bank during in-channel construction within Prefumo and San Luis Obispo Creeks, they could become entrapped in areas being dewatered during installation of diversion structures within these creeks in the construction work area. Implementation of the avoidance and minimization measure identified above would ensure that the proposed project would not result in the injury or mortality of southwestern pond turtles. Although the nature of potential impacts on southwestern pond turtle would be the same under both Alternative 3 and Alternative 6, the amount of habitat impacted would be different. The differences in impacts on riparian and aquatic habitat between Alternatives 3 and 6 are described below.

Alternative 3. Implementation of Alternative 3 would result in a permanent loss of approximately 0.16 hectare (0.40 acre) and temporary disturbance of approximately 0.34 hectare (0.84 acre) of riparian forest within the study area (Figure 3-1a). This alternative would also result in a permanent loss of approximately 0.03 hectare (0.07 acre) and temporary disturbance of approximately 0.08 hectare (0.19 acre) of perennial aquatic habitat for southwestern pond turtle.

Alternative 6. Implementation of Alternative 6 would result in a permanent loss of approximately 0.41 hectare (1.01 acres) and temporary disturbance of approximately 0.2 hectare (0.52 acre) of riparian forest within the study area (Figure 3-1a). This alternative would also result in a permanent loss of approximately 0.06 hectare (0.15 acre) and temporary disturbance of approximately 0.04 hectare (0.11 acre) of perennial aquatic habitat for southwestern pond turtle.

4.3.3.4 Compensatory Mitigation

No compensatory mitigation for southwestern pond turtles is recommended.

4.3.3.5 Cumulative Impacts

Impacts on southwestern pond turtles will be avoided and minimized during project construction. No cumulative effects on the species are anticipated.

4.3.4 Two-Striped Garter Snake

Two-striped garter snake is designated as a state species of special concern. Two-striped garter snake has a continuous range from northern Monterey County south through the South Coast and Peninsular Ranges to La Presa, Baja California (Jennings and Hayes 1994). The elevational range of two-striped garter snake is from sea level to approximately 2,450 meters (8,000 feet) on Mt. San Jacinto (Jennings and Hayes 1994).

Two-striped garter snakes inhabit perennial and intermittent streams and ponds in chaparral, oak woodland, and forest habitats. The species is primarily associated with aquatic habitats that are bordered by riparian vegetation and provide open areas nearby for basking (Jennings and Hayes 1994, Rossman et al. 1996).

4.3.4.1 Survey Results

Two-striped garter snakes were not observed during reconnaissance-level field surveys conducted within Prefumo and San Luis Obispo Creeks within the study area. However, focused surveys for this species were not conducted. Suitable habitat is present within Prefumo and San Luis Obispo Creeks and the species is known to occur in San Luis Obispo County (CNDDB 2006).

4.3.4.2 Avoidance and Minimization Measures

Implementation of the avoidance and minimization measure described above under sections 4.1.1, “Riparian Forest” and 4.3.2, “Foothill Yellow-Legged Frog” would minimize potential project impacts on two-striped garter snakes.

4.3.4.3 Project Impacts

Prefumo and San Luis Obispo Creeks in the study area provide suitable aquatic habitat for two-striped garter snakes. If two striped-garter snakes are present in the creek channel or along the creek bank during in-channel construction, it is expected that they would move out of the way of construction equipment and would not be harmed. The potential exists for two-striped garter snakes to become entrapped in areas being dewatered during installation of diversion structures within Prefumo and San Luis Obispo Creeks in the construction work area. The nature of potential impacts on two striped-garter snakes would be the same under both Alternative 3 and Alternative 6.

4.3.4.4 Compensatory Mitigation

No compensatory mitigation for two-striped garter snakes is recommended.

4.3.4.5 Cumulative Impacts

Impacts on two-striped garter snakes will be avoided and minimized during project construction. No cumulative effects on the species are anticipated.

4.3.5 Cooper's Hawk, White-Tailed Kite, and Other Migratory Birds

Several sensitive (including Cooper's hawk and white-tailed kite) and non–sensitive migratory birds could nest in and adjacent to the study area. The breeding season for most birds is generally from March 1 to August 15. Cooper's hawk is designated as a state species of special concern. It is a year-round resident throughout much of California, except in the high Sierra Nevada. Migrants from the north winter in California; residents move downslope and south from areas of heavy snow in fall and return in spring (Zeiner et al. 1990). Cooper's hawk nests in coniferous and deciduous trees; it prefers second-growth conifers and deciduous riparian areas along streams. It forages along forest edges and in broken habitats for small birds and small mammals (Zeiner et al. 1990).

White-tailed kite is a fully protected species under CFGC 3511. The species has a restricted distribution in the United States, occurring only in California and western Oregon and along the Texas coast (American Ornithologists' Union 1983). The species is fairly common in California's Central Valley lowlands. White-tailed kites nest in riparian and oak woodlands and forage in nearby grasslands, pastures, agricultural fields, and wetlands. White tailed kites use nearby treetops for perching and nesting sites. Voles and mice are common prey species.

4.3.5.1 Survey Results

Cooper's hawk and white-tailed kite has been observed within 10-miles of the study area (CNDDB 2006) and suitable nesting and foraging habitat is present within the study area. No Cooper's hawks or white-tailed kites were observed in the study area during the 2006 reconnaissance-level surveys conducted between April and July. A focused nest survey was not conducted during the 2006 reconnaissance-level field surveys. Within the study area suitable nesting habitat for migratory birds occurs within riparian forest, seasonal wetland, annual grassland, and emergent marsh habitats. Migratory birds observed in and near the study area included red-winged blackbird, northern mockingbird, lesser goldfinch, song sparrow, red-shouldered hawk, and red-tailed hawk.

4.3.5.2 Avoidance and Minimization Measures

Implementation of measures described under sections 4.1.1, "Riparian Forest," and the following measure would ensure that the proposed project would not result in the loss of nests containing eggs or young of Cooper's hawk, white-tailed kite, or other migratory birds.

Measure BIO-13: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary

To avoid and minimize impacts on nesting migratory birds and raptors, the City or its contractor will implement one or more of the following surveys and restrictions.

- If feasible, conduct all tree and shrub removal and grading (within annual grasslands) during the nonbreeding season (generally between August 16 and February 28) for most migratory birds and raptors.
- If construction activities are scheduled to occur during the breeding season for migratory birds and raptors (generally between March 1 and August 15), a qualified wildlife biologist (with knowledge of the species to be surveyed) shall be retained to conduct the following focused nesting surveys prior to the start of construction and within the appropriate habitat.
  - **Cooper's Hawk, White-Tailed Kite, and other Tree-Nesting Raptors.** Tree-nesting raptor surveys will be conducted before any construction disturbances occurring in or near suitable nesting habitat (riparian forest) located within the permanent and temporary impact area and up to 91.4 meters (300 feet) outside the permanent and temporary impact area between March 1 and August 15.
  - **Tree and Shrub Nesting Migratory Birds.** Tree- and shrub-nesting surveys for loggerhead shrike and other non-special-status migratory birds and raptors shall be conducted prior to any tree and shrub trimming or removal activities located within the permanent and temporary impact area between March 1 and August 15.
  - **Northern Harrier and other Ground-Nesting Migratory Birds.** Ground-nesting surveys for northern harrier and other ground-nesting migratory birds shall be conducted before any construction disturbances occur in freshwater marsh, seasonal wetland, annual grassland, or agricultural areas located within the permanent and temporary impact area between March 1 and August 15.

  The nesting surveys should be conducted within 1 week prior to initiation of construction activities that will occur in suitable habitat between March 1 and August 15. If no active nests are detected during these surveys, then no additional mitigation is required.
- If surveys indicate that migratory bird or raptor nests are found in the survey area identified above, a no-disturbance buffer shall be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or after a qualified wildlife biologist determines that the young have fledged (usually late June to mid-July). The extent of these buffers shall be determined by the biologist (coordinating with the City, Caltrans, and CDFG) and will depend on the level of noise or construction disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. Suitable buffer distances may vary between species.

- If construction activities are scheduled to occur within an area that supports an active nest site or within an established no-disturbance buffer, construction will be delayed until after the breeding season or until the young have fledged (as determined by the biologist).

4.3.5.3 Project Impacts

The proposed project would result in a permanent loss and temporary disturbance of potential nesting habitat for Cooper's hawk, white-tailed kit, and other migratory birds Vegetation removal or noise associated with construction activities could result in the disturbance of nesting migratory birds if active nests are present within or near the permanent or temporary construction impact area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. Such disturbance would violate California Fish and Game Code Sections 3503 (bird nests), 3503.5 (raptor nests), 3511 (fully protected birds), 3513 (migratory birds), and the MBTA. The nature of potential impacts on Cooper's hawks, white-tailed kites, and other migratory birds would be the same for both Alternative 3 and Alternative 6.

4.3.5.4 Compensatory Mitigation

Implementation of the avoidance and minimization measure described above would ensure that the proposed project would not result in the loss of migratory birds, raptors, or occupied nests. In addition, avoidance and minimization measures described under sections 4.1.1, "Riparian Forest" and 4.1.5 "Freshwater Marsh" would mitigate for the permanent and temporary loss of potential nesting habitat in the study area. No additional compensatory mitigation for migratory birds is recommended.

4.3.5.5 Cumulative Effects

Because the proposed project will avoid removal of occupied migratory bird nests, no cumulative impacts are anticipated. The proposed project would result in the permanent loss and temporary disturbance of potential nesting habitat for Cooper's hawks, white-tailed kites, and other migratory birds. Because the proposed project would mitigate for the loss of this habitat through revegetation and enhancement of habitat within the study area, the proposed project will not result in cumulative impacts on habitat for migratory birds.

4.3.6 Western Burrowing Owl

Western burrowing owl is a federal species of concern and a state species of special concern, and is protected during its nesting season under the MBTA and the California Fish and Game Code Section 3503.5. Burrowing owl is a ground-nesting raptor that typically uses the burrows of other species, such as ground squirrels, for nesting and thermal and escape cover. Burrowing owl is a species of special concern in California because suitable habitat and both local and statewide populations have declined (California Department of Fish and Game 1995).

Burrowing owls are a yearlong resident in a variety of grasslands, as well as in scrublands with a low density of trees and shrubs and low-growing vegetation. Burrowing owls that nest in the Central Valley may winter elsewhere. The primary habitat requirement of the burrowing owl is burrows appropriate for nesting. Burrowing owls usually nest in abandoned ground squirrel burrows, although they have been known to construct their own burrows in softer soils. In urban and agricultural areas, burrowing owls often use artificial burrows, such as pipes, culverts, and

piles of concrete debris. This semicolonial owl breeds from March through August and is most active while hunting during dawn and dusk.

4.3.6.1 Survey Results

No burrowing owls were observed in the study area during the 2006 reconnaissance-level surveys conducted between April and July. Historically, burrowing owls are known to occur along Froom Creek, where they were observed in 1988 during surveys conducted for the Froom Creek Project, northwest of the study area (Holland et. al. 1988). Within the study area, annual grasslands and agricultural lands provide potential breeding or wintering habitat for burrowing owls. However, these areas are heavily disturbed by adjacent development and ongoing agricultural practices, reducing the likelihood that burrowing owls would occur within the study area. If burrowing owls are present in the project vicinity, they could use existing ground squirrel burrows are present within annual grassland habitat located west of Calle Joaquin Road and LOVR (Figure 3-1).

4.3.6.2 Avoidance and Minimization Measures

Implementation of the following avoidance and minimization measures would ensure that the proposed project would not result in the loss of burrowing owl eggs or young.

Measure BIO-14: Conduct a Preconstruction Survey for Burrowing Owl in Accordance with the California Department of Fish and Game Guidelines and Establish a No-Disturbance Buffer, if Necessary

CDFG (1995) recommends that a preconstruction survey be conducted to locate active burrowing owl burrows in the construction work area and within a 75-meter-wide (250-foot-wide buffer) zone around the construction area. A qualified wildlife biologist will be retained to conduct a preconstruction survey for active burrows according to CDFG's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995). The preconstruction survey will be conducted within 30 days before construction activities begin. If no burrowing owls are detected, no further mitigation is required. If active burrowing owl burrows are identified within or near the permanent or temporary construction impact area, the City will implement the following measures:

- Occupied burrows will not be disturbed during the breeding season (February 1 to August 31).
- When destruction of occupied burrows is unavoidable during the nonbreeding season (September 1 to January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on protected lands approved by CDFG. Newly created burrows will follow guidelines established by CDFG.
- If owls must be moved away from the project site during the nonbreeding season, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping, as described in the CDFG guidelines. At least one week will be necessary to complete passive relocation and allow owls to acclimate to alternate burrows.

4.3.6.3 Project Impacts

The proposed project would result in a permanent and temporary loss of annual grassland and agricultural lands that provide potential habitat for burrowing owls. Ground disturbing activities or noise associated with construction activities could result in the disturbance of breeding or wintering burrowing owls if active burrows are present within or near the permanent or temporary construction impact area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the study area. The MBTA and Section 3503.5 of the California Fish and Game Code prohibit the "take" of migratory birds, nests, and young. The nature of potential impacts on burrowing owls would be the same for both Alternative 3 and Alternative 6.

4.3.6.4 Compensatory Mitigation

The following measure would be implemented if occupied breeding or wintering burrowing owl burrows are identified within the permanent or temporary construction impact area and will be affected.

Measure BIO-15: Compensate for the Loss of Burrowing Owl Habitat in Accordance with DFG Guidelines

If active burrowing owl burrows are found within the permanent or temporary construction impact area and the owls must be relocated, the City shall offset the loss of foraging and burrow habitat in the construction area by complying with CDFG's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 1995).

4.3.6.5 Cumulative Effects

Western burrowing owls are not known to occur in the study area and the study area provides low quality habitat that is subject to disturbance from adjacent urban development and ongoing agricultural activities. Better quality habitat occurs within open grasslands located north and west of the study area. Overall, there is a low potential for burrowing owls to be affected by the proposed project. No cumulative effects on western burrowing owls are expected.

4.3.7 Swallows

Cliff and barn swallows are two swallow species that frequently build mud nests on the underside of artificial structures, such as bridges. The two species winter in South America and arrive back in California to breed in February. Nesting generally occurs from March 1 to August 15, and migration south occurs June through October (Zeiner et al. 1990).

4.3.7.1 Survey Results

Active swallow nests were not observed in the study area during the 2006 reconnaissance-level surveys conducted between April and July. However, existing bridges and box culverts in the study area provide potential nesting areas for swallows. Swallows will often build mud nests on the underside of concrete structures over permanent or semi-permanent water sources.

4.3.7.2 Avoidance and Minimization Measures

Implementation of the following measure would ensure that the proposed project would not result in the loss of swallow nests containing eggs or young.

Measure BIO-16: Conduct a Preconstruction Nesting Swallow Survey and Install Exclusion Netting on the Underside of Bridges or Culverts to Prevent Swallows from Nesting

To avoid impacts on nesting swallows and other bridge-nesting migratory birds that are protected under the MBTA and Fish and Game Codes, the City will implement the following avoidance and minimization measures.

- If bridge or box culvert construction will take place during the breeding season (generally between February 15 and August 31), a qualified wildlife biologist will be hired to inspect these areas during the swallows' non-breeding season (September 1 through February 14). If nests are found and are abandoned, they may be removed. To avoid damaging active nests, all nests must be removed before the breeding season begins (February 15).
- After nests are removed, the undersides of the bridges and box culverts may be covered with 1.3- to 1.9-centimeter (0.5- to 0.75-inch) mesh net or poultry wire, or nests may be hosed and scraped every three days during construction to prevent swallows from reestablishing new nests. All net installation shall occur before February 15. The netting shall be anchored so that swallows cannot attach their nests through gaps in the net.
- If netting of the bridges and box culverts does not occur by February 15 or more than three days lapse between scraping and hosing and swallows colonize these areas, modifications to the structure supporting active swallow nests should not begin before September 1 of that year or until a qualified biologist has determined that the young have fledged and all nest use has been completed.

If appropriate steps are taken to prevent swallows from constructing new nests, work can proceed at any time of the year.

4.3.7.3 Project Impacts

Modifications to the existing bridges and box culverts in the study area could result in the direct loss of active swallow nests. Loss of a nest could in turn result in the death of adults, young, or eggs. Construction activities that would remove any occupied nests with eggs or young would violate California Fish and Game Code Sections 3503 (active bird nests), 3513 (migratory bids), and the MBTA (50 CFR 10 and 21). The nature of potential impacts on nesting swallows would be the same for both Alternative 3 and Alternative 6.

4.3.7.4 Compensatory Mitigation

No compensatory mitigation for nesting swallows is required.

4.3.7.5 Cumulative Effects

The proposed project will avoid removal of occupied swallow nests; therefore, no cumulative impacts are anticipated.

4.4 Sensitive Fish Species

One special-status fish species occurs in the study area: south-central California coast steelhead, (threatened). The life history requirements of the species are discussed in detail below. Critical

habitat for steelhead falls within the study area and is discussed in a BA prepared for the project (Appendix B).

4.4.1 South-Central California Coast Steelhead

South-central California coast steelhead was listed as threatened by NOAA Fisheries on August 18, 1997 (62 FR 43937) and is a California State species of special concern. The south-central California coast steelhead distinct population segment (DPS) includes populations from the Pajaro River south to, but not including, the Santa Maria River. San Luis Obispo, Prefumo and Froom Creeks are designated as critical habitat for steelhead by NOAA Fisheries (70 FR 52574 September 2, 2005). Critical habitat falls within the study area.

South-central California coast steelhead generally enter fresh water between December and April, with most migration occurring from January through March (The Habitat Restoration Group 1997). Migration timing is determined by winter storms that provide sufficient flows to permit upstream migration. The preferred migration temperatures for steelhead range between 7.8 and 11.1ºC (46 and 52ºF) (National Marine Fisheries Service 2000). Spawning generally begins when trout reach spawning areas.

During spawning, the female digs a redd (gravel nest), into which the eggs are deposited and then fertilized by the male. Steelhead prefer substrate no larger than 10 centimeters (4 inches) (Bjornn and Reiser 1991). Steelhead spawn in cool, well-oxygenated water (Hampton 1988). Optimal water temperatures for spawning and incubation range between 3.9 and 11ºC (39 and 52ºF) (Myrick and Cech 2001). Incubation lasts from 1.5 to 4 months, depending on water temperature (Moyle 2002).

Instream and overhead cover, in the form of undercut banks, downed trees, and overhanging tree branches, is important for juvenile rearing. The addition of cover increases spatial complexity and may increase productivity. Fine-textured in-stream woody material provides the hydraulic diversity necessary for selection of suitable velocities, access to drifting food, and escape refugia from predatory fish (Raleigh et al. 1986).

Juvenile steelhead feed on a variety of aquatic and terrestrial insects and other small invertebrates. They may rear for 1 to 2 years in their natal streams. Steelhead smolts (1 to 2 year olds) emigrate from March to May. Ocean rearing lasts 2 to 3 years.

4.4.1.1 Survey Results

Review of available literature and data sources of species occurrence indicates that south-central California coast steelhead persist in streams that pass through the project area. A species occurrence list generated by USFWS indicates that south-central California coast steelhead are likely to occur in streams within the study area (Appendix B). The following information on steelhead abundance and distribution within streams that pass through the study area is summarized from Thomas R. Payne & Associates who mapped surface flow conditions and conducted a detailed analysis of steelhead abundance and distribution for select pool habitats in the San Luis Obispo Creek drainage during September and October 2003 (Thomas R. Payne & Associates 2004). Because this study was conducted in the fall prior to the winter rainy season,

habitat conditions and steelhead occurrence observed during this study are likely indicative of average conditions during the summer.

San Luis Obispo Creek

Approximately 25.8 kilometers (16 miles) of San Luis Obispo Creek was surveyed beginning 2.9 kilometers (1.8 miles) upstream from the mouth of the creek to the upper extent of the wetted channel, 2.4 kilometers (1.5 miles) below Cuesta Pass. Three separate reaches of San Luis Obispo Creek were identified during the study: the lower, middle, and upper reach. The lower reach extended approximately 9.5 kilometers (5.9 miles) from 2.9 kilometers (1.8 miles) upstream of the creek mouth to the City's Water Reclamation Facility (WRF); the WRF is located a short distance upstream from the existing LOVR bridge over San Luis Obispo Creek. The middle reach extended approximately 7.7 kilometers (4.8 miles) from the WRF to the lowermost U.S. 101 bridge crossing located east of the City of San Luis Obispo. The upper reach extended approximately 6 kilometers (3.7 miles) from U.S.101 bridge crossing to the upstream limit of the wetted channel, which in 2003 was approximately 2.4 kilometers (1.5 miles) downstream from Cuesta Pass. Snorkel surveys and limited electrofishing surveys of select pool habitats in San Luis Obispo Creek indicated that young-of-year and juvenile steelhead were present in low but relatively constant densities throughout the main channel reaches of San Luis Obispo Creek (Thomas R. Payne & Associates 2004). In 2003, surface flow was present over a majority of the surveyed length of San Luis Obispo Creek. Surface flow was absent in three channel segments: a 2.6-kilometer (1.6-mile) segment extending upstream from near the WRF; a 1.3-kilometer (0.8 mile) segment extending upstream from near the downstream boundary of the upper reach; and the upper 2.4-kilometer (1.5-mile) segment of the watershed. Generally, stream flow in San Luis Obispo Creek was less than 0.06 cubic metes (2 cubic feet) per second upstream of the WRF; however, discharges to San Luis Obispo Creek from the WRF augmented natural creek flows by about 0.17 cubic meters (6 cubic feet) per second, resulting in a continuously wetted channel all the way to the creek mouth (Thomas R. Payne & Associates 2004). Juvenile steelhead populations downstream of the WRF outfall are likely supported by these releases (Spina et al. 2005, 919).

Within the study area, San Luis Obispo Creek supports rearing habitat for juvenile steelhead, and is a known migration corridor for adult steelhead and outmigrating juveniles, including steelhead smolts. Juvenile trapping conducted near the WRF from mid-March to December between 2000 and 2002 indicated that steelhead smolt migration occurs from March through May, with a peak in April. However, some juvenile downstream migration has been observed to occur through December (Spina et al. 2005, 923-924). Gravel bars present in the vicinity of the LOVR bridge may also support spawning of adult steelhead, although to what extent adults use this habitat for spawning and successful incubation is supported is unknown.

Prefumo Creek

Prefumo Creek joins San Luis Obispo Creek immediately upstream of the LOVR bridge and approximately 61 meters (200 feet) downstream of the WRF outfall. The creek drains a watershed area generally to the west of San Luis Obispo Creek and flows through Laguna Lake, a natural waterbody that is located approximately 1.8 kilometers (1.1 miles) upstream from the San Luis Obispo Creek – Prefumo Creek confluence. During their survey of Prefumo Creek, Thomas R. Payne & Associates identified four separate reaches: the bottom, lower, middle, and upper reach. The bottom reach of Prefumo Creek, the lowermost portion of which occurs in the

study area, extends from the creek's confluence with lower San Luis Obispo Creek, approximately 61 meters (200 feet) below the WRF outfall, to the weir that regulates water surface elevations in Laguna Lake. Where Prefumo Creek joins San Luis Obispo Creek, the creek is a deep, turbid, brushy slough that typically supports numerous large carp and, during fall, adult Chinook salmon (*O. tshawytscha*). A fishway, constructed in 2003, provides access for upstream migrating adult steelhead up to and through the reinforced concrete box (RCB) culvert located under U.S. 101. Upstream of the culvert and extending to Laguna Lake, Prefumo Creek was observed to be either dry or intermittent during the 2003 survey. Segments with intermittent flow consisted of stagnant pools containing dead carp. The generally intermittent nature of the creek in this reach and presence of dead carp suggest that this reach does not support summer rearing habitat for steelhead, at least in some years. Upstream of Laguna Lake, the Prefumo Creek channel was observed to be dry for the first 2.82 kilometers (1.75 miles). In this segment of the creek, identified as the lower reach, Prefumo Creek turns in a southwesterly direction where it begins its ascent into the hills above Los Osos Valley. A substantial increase in gradient is present immediately downstream of the LOVR bridge and access to upstream habitats is facilitated by a fish ladder through a concrete-lined portion of the creek. In 2003, the 0.68-kilometer-long (0.42-mile-long) middle reach was the only reach with surface flow. Young-of-year and juvenile steelhead were observed in pools habitats in this reach which was characterized as having a channel lined by grass rather than dense willows, vines, or brush and a relatively high levels of shade provided by a canopy of mature trees. Upstream of the middle reach, Prefumo Creek was dry for the remaining 4.3 kilometers (2.7 miles) of the watershed.

Within the study area, Prefumo Creek supports migratory habitat for adult and juvenile steelhead. Summer rearing habitat may be available in wet years, but it is unknown to what extent this habitat supports summer rearing.

Froom Creek

Froom Creek drains a relatively small watershed area to the west of San Luis Obispo Creek and joins San Luis Obispo Creek a short distance downstream from the LOVR bridge. Three reaches were identified in Froom Creek during the 2003 investigations: the lower, middle, and upper reaches. Only the 1.14-kilometer-long (0.71-mile-long) middle reach had surface flow. Young-of-year and juvenile steelhead were collected from the sampled pool habitats. In general, Froom Creek was found to be densely vegetated and had one of the steepest gradients (>7%) of all the reaches surveyed. Instream cover was abundant as a result of the presence of boulder and cobble substrates and the dense scrub vegetation lining the creek.

Based on a review of available information regarding the current abundance and distribution of steelhead within Froom Creek, juvenile steelhead are not likely to be present in the construction area during the summer construction period. In addition, adult spawning and adult and juvenile migration occur largely outside the summer construction period and project construction will not affect migration of adults or juveniles into or out of Froom Creek because no changes to Froom Creek or the RCB culvert under Calle Joaquin Road and U.S. 101 are proposed.

4.4.1.2 Avoidance and Minimization Measures

As part of the proposed action, the City will implement preventive actions to avoid and minimize potential adverse construction effects on aquatic and riparian resources by replanting riparian vegetation disturbed or removed during construction. A storm water pollution prevention plan

(SWPPP) will be implemented as part of the National Pollutant Discharge Elimination System (NPDES) and a General Construction Activity Storm Water Permit to minimize the potential for sediment input to the aquatic system, where it could adversely affect steelhead spawning and rearing habitat. A toxic materials control and spill response plan will be implemented to regulate the use of hazardous materials, such as the petroleum-based products used as fuel and lubricants for equipment and other potentially toxic materials associated with project construction.

Any activity that will temporarily divert flow from any segment of the river will require implementation of a variety of constraints. Pile driving activities will also require sound minimization measures. Although construction will occur during the low-flow period (June 1 through October 31), in-channel construction activities could result in some harassment or delay of migrating juvenile steelhead from noise, artificial light, and other disturbances. Injury or mortality could also occur due to pile driving and fish salvage and relocation efforts. These disturbances are expected to take place over two dry seasons, each four months in duration. Some juvenile steelhead are expected to be in the project area during in-channel construction and will be affected by project activities. Juvenile survival and growth could be affected. Implementation of avoidance and minimization measures described under sections 4.1.1, "Riparian Forest", 4.1.4 "Seasonal Wetland", and the following measures will ensure that the proposed project avoids and minimizes potential adverse construction effects on steelhead in San Luis Obispo and Prefumo Creeks. All of the measures below apply to both creeks.

Measure BIO-17: Limit In-Channel Construction Activities to the Low-Precipitation Period
In-channel construction, including riverbank and channel bed construction below the ordinary high-water mark (OHWM), will be limited to the summer low-precipitation period (June 1 to October 31) to minimize adverse effects on adult fish spawning and smolt migration. Project construction in the channel will also be subject to the following constraints:

- Construction requiring stream dewatering, stream crossings, or work in the channel bed will not start before June 1. Upstream and downstream passage for fish, including juvenile steelhead, will be provided through or around construction sites at all times. Cofferdams will be installed in all creeks to divert streamflow around each footing excavation. The construction period limits will also apply to a water diversion system (i.e. an open, lined ditch) that will be needed on San Luis Obispo Creek. Limiting in-channel construction to the June 1 to October 31 period will achieve two goals:
  - Construction will not be concurrent with the primary migration and spawning periods of steelhead.
  - The length of the construction period will be maximized, thereby reducing the potential for in-channel construction (i.e., below the OHWM) to have to be extended beyond October 31 of that year, or into the following construction season.

Measure BIO-18: Implement Water Quality Measures
The City will avoid or minimize increased sediment input to the project area channel. As part of the NPDES General Construction Activity Storm Water Permit, a SWPPP will be implemented that includes the following:

- conducting all construction work according to site-specific construction plans that minimize the potential for sediment input to the aquatic system;
- identifying all areas requiring clearing, grading, revegetation, and recontouring, and minimizing the areas to be cleared, graded, and recontoured;
- grading spoil sites to minimize surface erosion;
- avoiding riparian and wetland vegetation wherever possible and identifying and fencing specific trees to protect existing riparian habitat;
- covering bare areas with mulch and revegetating all cleared areas;
- avoiding equipment operation in flowing water during in-channel activities by constructing coffer dams and diverting all streamflows through or around construction sites; and
- constructing sediment catch basins across stream channels immediately below the project site when performing in-channel construction to prevent silt- and sediment-laden water from entering the main streamflow (accumulated sediments will be periodically removed from the catch basin).

Increased pollutant input to the project area channel will also be minimized and avoided by:

- preventing raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses;
- establishing a spill prevention and countermeasure plan before project construction that includes strict onsite handling rules to keep construction and maintenance materials out of drainages and waterways;
- cleaning up all spills immediately according to the spill prevention and countermeasure plan and notifying CDFG and NOAA Fisheries immediately of any spills and cleanup activities;
- providing areas located outside the OHWM for staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants;
- removing vehicles from the normal high-water area of the waterway before refueling and lubricating; and
- avoiding operation of equipment in flowing water.

Implementation of measures to avoid or minimize the effects of increased sediment input will also avoid and minimize increased input of pollutants associated with sediments (e.g., mercury) and the potential for subsequent effects on steelhead.

Measure BIO-19: Implement Stream Diversion Restrictions

Flow will be diverted in San Luis Obispo Creek during bridge widening and other in-channel work. Flow will be diverted from June 1 to October 31. As stated in the project description, flow will be diverted on San Luis Obispo Creek beginning at a point upstream of the LOVR bridge. An open, lined ditch will be constructed under the bridge and through the construction

area to maintain a continuously flowing stream. Any activity that temporarily diverts flow from any segment of the creeks will trigger implementation of the following constraints.

- Before flow is diverted, cofferdams will be placed so that flow to river segments downstream from the construction site will not be interrupted.
- Subject to the sufficiency of ambient conditions, adequate fish passage conditions will be sustained by maintaining contiguous flows, avoiding the creation of vertical drops in excess of 15.2 centimeters (6 inches), and maintaining suitable water velocities (i.e., 2.4 meters [8 feet] per second or less) and water depths (minimum of 0.3 meter [1 foot]).

Measure BIO-20: Avoid Stranding Impacts to Fish in Dewatered Areas
A qualified fish biologist will be onsite during the installation of cofferdams and during the cofferdam dewatering process to capture and move trapped salmonids and other fish. The fish will be relocated to the nearest suitable habitat unaffected by construction activities and upstream of the work area. Within temporarily drained stream channel areas, salvage activities shall be initiated before or at the same time as stream area draining and completed within a timeframe necessary to avoid injury and mortality of steelhead. Protocols for the capture, handling, and release of fish will be developed in cooperation with NOAA Fisheries, CDFG, the City, and Caltrans. Fish biologists will contact NOAA Fisheries and CDFG immediately if any steelhead are found dead or injured.

Measure BIO-21: Avoid and Minimize Impacts to Spawning Habitat
The City will, to the extent practicable, avoid disturbance to any spawning gravel beds located in the study area on San Luis Obispo Creek. If disturbance to the gravel cannot be avoided, the gravel will be removed temporarily and replaced to pre-disturbance conditions. Before returning gravels to the channel following construction, gravels will be washed to remove fines before they are placed back into the creek channel. If it becomes necessary to augment disturbed gravels with gravel from outside sources, only washed river gravel (to remove fines) appropriately sized for adult steelhead, (0.5 inch to 3.0 inches) will be used.

Measure BIO-22: Minimize Noise Impacts from Pile Driving
Potential injury and mortality associated with pile driving will be avoided or minimized by the following measures:

- In-channel construction will be limited to the summer low-flow period (June 1 to October 31) when stream flow in the creek is typically low, thereby minimizing the potential for sound pressure waves to travel long distances.
- Restriction of pile driving activities to the low-flow period coincides with the least likely occurrence of upstream migrating adults and downstream steelhead smolt migration.
- The smallest pile driver and minimum force necessary will be used to complete the work.
- Pile driving will be done within the dewatered cofferdams.

Measure BIO-23: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization

The potential for loss of steelhead spawning and rearing habitat will be avoided or minimized by the following measures:

- the amount of riparian vegetation removal, including vegetation providing SRA cover, substrate, and instream woody material necessary to ensure suitable fish passage conditions will be minimized, and existing spawning and rearing habitat will be maintained;
- disturbance to the stream width, depth, velocity, and slope will be minimized and modified or disturbed portions of the stream, banks, and riparian areas will be restored as nearly as possible to their preproject contours (i.e., elevations, profile, and gradient);
- native riparian vegetation and/or large woody material will be included where rock slope protection (RSP) is needed, either by burying the RSP and planting vegetating on the reconstructed banks, or by incorporating vegetation and woody material directly into the RSP;
- environmentally sensitive areas will be fenced to prevent encroachment of equipment and personnel into riparian areas, stream channels, and banks to the maximum extent practicable (see Measure BIO-1);
- disturbance and removal of aquatic vegetation will be avoided to the extent practicable; temporary fills, coffer dams, and other in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality and restores pre-existing streambed gradient and contours;
- fine sediments removed downstream of the LOVR bridge (approximately 1,022 square meters (11,000 feet)) will be removed only from floodplain surfaces and no sediment will be removed from the low-flow channel; and
- substrate in the low-flow channel, including gravel supporting spawning habitat, that is removed during project construction will be set aside, washed to remove fines, and then returned to the channel following completion of project construction. If it is determined that a net loss in spawning gravel area occurs as a result of project construction, the City will augment gravels in the construction area with appropriately-sized spawning gravels (0.5 inch to 3.0 inches) .

Measure BIO-24: Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks

The potential for substantial increases in water temperature will be avoided or minimized by the following measures:

- exclusionary fencing will be used to minimize the potential for the accidental removal of more vegetation than is necessary to complete construction (see Measure BIO-1);
- soil compaction will be minimized by using equipment that can reach over sensitive areas, thereby ensuring suitable soil conditions for mitigation plantings;

- disturbance to the stream width, depth, velocity, and slope will be minimized and modified or disturbed portions of the stream, banks, and riparian areas will be restored as nearly as possible to their preproject contours (i.e., elevations, profile, and gradient); and
- gaps in the post-construction canopy (i.e., shade), will be reduced by restricting extensions of streambank RSP or other bank protection (e.g., sheet piles or bank and channel armoring) to the minimum necessary to protect essential infrastructure.

4.4.1.3 Project Impacts

The City forecasts the entire LOVR Interchange Improvement Project will take 3 dry seasons but work for the creek crossings and riparian areas will be restricted to 2 dry seasons. The number of working days in these sensitive areas will be determined during the permit phase but will not exceed 300 days.

The following construction activities from Alternative 3 will affect San Luis Obispo and Prefumo Creeks:

1. Extend existing San Luis Obispo Creek Culvert Crossing to accommodate widened LOVR.
2. Construct additional box culvert capacity under US-101 for Prefumo Creek.
3. Remove deposited material from SLO Creek bed under LOVR to restore design hydraulic capacity.
4. Widen/reconstruct US-101 northbound off-ramp and construct retaining wall to avoid creek impacts.
5. Widen US-101 southbound off-ramp and construct retaining walls.

The following construction activities from Alternative 6 will affect San Luis Obispo and Prefumo Creeks:

- Extend existing San Luis Obispo Creek Culvert Crossing to accommodate widened LOVR
- Remove deposited material from the SLO Creek bed under LOVR to restore the design hydraulic capacity
- Replace the LOVR US-101 Overcrossing with a new four-lane overcrossing
- Construct northbound US-101 on-ramp bridge and retaining walls at Prefumo Creek
- Construct additional box culvert capacity under US-101 for Prefumo Creek
- Remove existing southbound US-101 ramps and Prefumo Creek Box Culvert
- Widen/Reconstruct US-101 northbound off-ramp and construct retaining wall
- Extend the Prefumo Creek box culvert under US-101 for new southbound off ramp
- No modification to drainage structures for Froom Creek at on/off ramps

Implementation of the proposed project could result in the following impacts to south-central California coast steelhead. In general, potential impacts on steelhead will be the same for both Alternative 3 and Alternative 6.

Impacts associated with the above activities include:

1. Increase in sedimentation and turbidity.
2. Release of contaminants and toxic materials.
3. Noise and disturbance.
4. Change in channel morphology and hydrology.
5. Loss and/or reduction of steelhead habitat (e.g. migration, spawning, and rearing habitat).

Impairment of Fish Survival, Growth, and Reproduction by Accidental Spills or Runoff of Contaminants

Construction activities would affect environmental conditions (i.e., physical, chemical, and biotic conditions) that can influence the extent and quality of fish species habitat and individually or synergistically determine the biological performance of species life stages and species populations. Contaminant pollution of water bodies is one mechanism through which fish species and their habitat could be affected.

Contaminants originate from the accidental spill, erosion, leaching, drift, or runoff of chemical and physical constituents that include sediment, oil and lubricants, concrete, and other chemicals used during maintenance, repair, and construction activities. Contaminants could be introduced to streams through any project action that includes:

- use of petroleum products for refueling and maintenance of construction equipment (potentially leading to accidental spills);
- roadway cleaning; and
- application and storage of construction materials.

Contaminants affect water quality constituent concentrations. The effect on fish and other aquatic species depends on the species' sensitivity to specific types and combinations of contaminants; the concentration, duration, and frequency of exposure; water temperature conditions; and other factors. Contaminants may reduce growth, reproduction, movement, and survival of individuals. Long-term or acute exposure over a substantial proportion of a species' habitat may reduce abundance, distribution, and production in the population and could affect the diversity of aquatic communities. Because construction activities are proposed to occur during the dry season (June 1 to October 31) adult and juvenile migration and adult spawning will not be affected by project activities. However, juveniles rearing in and around the project area could be affected by contaminants if accidental spills or unintended discharges were to occur.

Through implementation of avoidance and minimization measure, Measure BIO-18: Implement Water Quality Measures described above, the proposed project will avoid or minimize the

potential for adverse effects on fish survival, growth, and reproduction by avoiding or minimizing the introduction of contaminants into aquatic habitats within the study area.

Reduction of Spawning or Rearing Habitat Quality or Quantity through Increased Input and Mobilization of Sediment

Disturbing soils and the bottoms of stream channels can increase erosion and the transportation of sediment to and within stream channels. Sediment is then deposited on the channel bottom, channel bank, and floodplain. The transport of sediment results in turbidity (i.e., the relative clarity of water that may be reduced by suspended sediment), which affects the behavior, growth, reproduction, and movement of fish and other aquatic organisms. Sediment deposition can alter channel morphology (e.g., fill pools; see definition of channel morphology below) and change the composition of gravel and other substrates, reducing the size of interstitial spaces and potentially affecting habitat availability and the survival of fish and other aquatic organisms.

The potential for erosion would increase during activities that disturb the soil, such as transporting, applying, or storing construction materials; removing riparian, wetland, or upland vegetation; and grading, clearing, and constructing access roads and work areas. In stream channels, sediment could be mobilized and transported by flow during removal of sediment from San Luis Obispo Creek; work in the stream channel; culvert and bridge construction; and pile driving.

The disturbance of soil and channel substrates and subsequent mobilization and transport to and within the stream channel would be avoided and minimized through implementation of Measure BIO-19: Implement Water Quality Measures identified above.

Impairment of Fish Passage and Reduced Availability of Holding, Spawning, and Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics

Channel morphology describes the linear, aerial, and volumetric features of a channel, including depth, length, width, and the shape or configuration of the channel (e.g., the characteristics of secondary channels, riffles, runs, pools, backwaters, and sloughs). Channel morphology, along with flow, affects *stream hydraulics*, which refers to a stream's depth, surface elevation, velocity, and turbulence. Together, channel morphology and hydraulics influence the conditions that support fish migration and movement and provide holding, rearing, and spawning habitat. Channel morphology and hydraulics have a major effect on cover and water temperature.

The channel morphology and hydraulics of the creeks may change in response to project actions. Removal of riparian and aquatic vegetation and removal of sediment and debris from the stream channel could temporarily alter channel morphology and hydraulic conditions that support fish movement and spawning and rearing habitat conditions. The permanent change to channel morphology and hydraulics may result in permanent loss of spawning and rearing habitat.

The extension of culverts and the widening of LOVR bridge on San Luis Obispo Creek, and the construction of new culverts and installation of RSP on Prefumo Creek could permanently change hydraulic conditions, potentially affecting fish movement and migration in these creeks. Potential adverse effects of the San Luis Obispo Creek culvert extensions include the creation of excessive water velocities or shallow water depths, and increasing the distance that fish must negotiate these conditions during their upstream migration. Unfavorable passage conditions

could result in delayed migration of juvenile and adult steelhead resulting from changes in hydraulic characteristics at this stream crossing. The potential for creating an impediment to fish passage from extending the arch culvert on San Luis Obispo Creek at the LOVR stream crossing would be avoided because the natural channel bottom would be maintained and the proposed removal of accumulated sediments in the outer two culverts and on the floodplain, in combination with the oversized nature of the culverts, would avoid or minimize the potential to create adverse hydraulic characteristics at this stream crossing relative to existing conditions.

The double 84-inch reinforced concrete pipe that will be added to the existing 18-by-8-foot concrete box culvert on Prefumo Creek will increase the capacity for flood flow conveyance under US-101 without affecting fish passage flows in the fishway. The extra capacity afforded by the new concrete pipe culverts on Prefumo Creek will avoid the need to modify the existing culvert and fishway under US-101, and may benefit fish passage conditions at this stream crossing by reducing the amount of flow entering the top step pool (which is undersized), and the resultant turbulence it creates. It is believed that the excessive turbulence compromises existing fish passage conditions at this stream crossing. The extra culvert capacity may reduce the volume of water entering the top step pool, and therefore the amount of turbulence in the pool. Consequently, existing fish passage conditions in Prefumo Creek at the US-101 stream crossing will either remain the same or improve slightly from construction of the extra culvert capacity.

Inchannel construction activities associated with the proposed project would require temporary redirection of the flow of water through the use of instream cofferdams and a temporary diversion channel. The temporary diversion channel would be approximately 240 feet long, and would consist of an open, earthened channel lined with plastic or other similar material to avoid water from seeping out of the channel. By proposing to use an open, but lined earthen channel to divert flows around construction areas, the City would minimize the potential for impeding the migration of adult and juvenile steelhead. In addition, the proposed construction period (June 1 – October 31) focuses on protecting migrating and spawning adult steelhead in the fall and winter and migrating juvenile steelhead in the spring. The earthen channel would be constructed to prevent the occurrence of unsuitable hydraulic conditions (e.g., shallow water depth or excessive water velocity) to further ensure that impacts on migrating adults or juveniles are minimized or avoided.

The adverse effects of temporary changes in channel morphology and hydraulics would be minimized through implementation of avoidance and minimization Measure BIO-21: Avoid and Minimize Impacts to Spawning Habitat and Measure BIO-23: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization described above. Loss of spawning substrate and rearing habitat related to permanent changes in hydraulics, sediment processes, and channel bottom stabilization would also be minimized. These measures would ensure that the extension of culverts and the LOVR bridges would continue to support upstream and downstream fish passage to spawning and rearing habitat.

Reduction of Fish Habitat Quantity or Quality through Removal and Destruction of Cover

Cover describes the physical components of a stream environment that provide shelter and hiding, resting, rearing, holding and feeding areas for fish and other aquatic organisms. Gravel,

cobbles, boulders, ledges, undercut banks, aquatic plants, saplings, brush, trees, and large woody debris (e.g., tree limbs, logs, rootwads) provide cover. The quantity and quality of cover for fish and aquatic invertebrates is a primary determinant of habitat availability and suitability. The occurrence of many aquatic species, including juvenile salmonids, depends on the size, density, and continuity of suitable cover.

For Alternative 3, construction activities associated with bridge widening would remove up to 274 linear meters (900 linear feet) of overwater riparian vegetation (SRA cover) along the stream banks. San Luis Obispo Creek will have 92 linear meters (300 linear feet) of SRA cover removed, and Prefumo Creek will have 184 linear meters (600 feet) removed. Of the total amount of SRA cover removed, 18 linear meters (60 linear feet) will be *permanently* removed along San Luis Obispo Creek, and 60 linear meters (200 linear feet) will be permanently removed along Prefumo Creek. These impact amounts represent affected bank lengths. For example, bridge widening on San Luis Obispo Creek would permanently affect 18 linear meters (60 linear feet) of the bank (i.e. 9 linear meters [30 feet] of linear stream length for the east and west bank).

For Alternative 6, construction activities associated with bridge widening would remove up to 366 linear meters (1,200 linear feet) of overwater riparian vegetation along the stream banks. San Luis Obispo Creek will have 92 linear meters (300 linear feet) of SRA cover removed, and Prefumo Creek will have 274 linear meters (900 linear feet) removed. Of the total amount of SRA cover removed, 46 linear meters (150 linear feet) will be permanently removed along San Luis Obispo Creek and 232 linear meters (760 linear feet) will be permanently removed along Prefumo Creek.

Approximately 10 feet of RSP will be placed in Prefumo Creek at the off-ramp from U.S. 101 to Los Osos Valley Road. Another 20 feet of RSP will be placed at the bridge crossing at U.S. 101 in Prefumo Creek. Twenty feet of RSP will also be placed in San Luis Obispo Creek at the existing bridge off of U.S. 101 and Los Osos Valley Rd. All RSP will be planted with native vegetation. Retaining walls will be built beyond the edge of the road and outside of riparian areas that surround both creeks. The retaining walls will help protect the riparian areas surrounding Prefumo and San Luis Obispo Creeks from disturbance of the extended roadways. Removal of riparian and aquatic vegetation and removal of substrate and debris from stream channels could temporarily and permanently diminish the quantity and quality of adult holding and juvenile rearing habitat in the affected stream reaches. However, the adverse effects from changes in cover would be minimized through implementation of avoidance and minimization measures identified above and through implementation of Measure BIO-3 “Replace Temporarily and Permanently Impacted Riparian Forest Vegetation” and Measure BIO-23: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization.

Temperature-Related Reduction of Fish Survival, Growth, Movement, or Reproduction through Removal of Shade and Changes in Channel Morphology

Water temperature is primarily affected by weather; however, changes in channel morphology and removal of shade can change the response of water temperature to weather conditions. Many aquatic species, especially some life stages of salmonids, have narrow ranges of water temperature tolerance. Water temperatures outside the range of tolerance affect the growth,

reproduction, survival, and movement of these fish, and ultimately affect habitat availability and species population abundance, distribution, and production. The magnitude, timing, frequency, duration, and rate of change in water temperature are important factors in the water temperature needs of each species life stage. Riparian vegetation will be temporarily or permanently removed during implementation of the proposed project. Removal of this vegetation would temporarily remove shade that is important for minimizing heat and maintaining water temperatures that support fish life stages present, especially during warmer months. Permanent changes in channel morphology that involve reducing water depth or increasing stream surface area could result in warming of the streamflow.

The adverse effects of temporary changes would be minimized through implementation of the avoidance and minimization Measure BIO-24: Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks described above. In addition, loss of shade, reduced depth, and increased stream surface area related to permanent changes in the stream channel and bank would be minimized to the extent practicable. Implementation of these measures would minimize or avoid the level of effects on water temperature that are likely to adversely affect juvenile steelhead. Disturbance, Injury, or Mortality of Individual Fish Resulting from Work in and Adjacent to Bodies of Water

Disturbance exhibits itself in a change in the behavior of an individual organism, such as movement, cessation of feeding, or interruption of reproductive activities. Disturbance can be caused by human activities that generate sufficient noise, light, physical movement, or vibration to change the behavior of individual organisms. Disturbance may alter species survival if vulnerability to predation is increased or if the disturbance is of sufficient duration and magnitude to affect growth or reproductive success.

Direct injury and mortality result from physical trauma, which can be caused by direct and indirect contact with humans or machinery, sound pressure waves (pile driving), or physiological response to disturbance (e.g., shock). Direct injury may impair fish movement, feeding, and survival.

Researchers have suggested that salmonids can hear pile-driving noise approximately 2,000-feet from the source (Feist et al. 1992). Feist further concluded that pile driving did in fact alter the distribution and behavior of juvenile salmon. The potential impact to salmonids from pile driving activities depends on the distance and duration of pile-driving activities. The effects on fish can range from avoidance to direct mortality depending on the species, life stage, and intensity of the pressure waves. Factors that influence the intensity of pressure waves include proximity to the source, the maximum force generated and the rate at which it is generated, and the characteristics of the medium (e.g., water and substrate) through which the waves travel.

Noise thresholds for fish have not been set in either state or federal regulations, although NMFS uses a peak sound pressure level of 180 dB (re: 1 μPapeak) as a threshold for impacts to fish. Recent piledriving experiments using juvenile steelhead (*O. mykiss*) found no barotraumas (physical damage to body tissues caused by a difference in pressure between an air space inside or beside the body and the surrounding gas or liquid) with exposure to peak sound pressure levels as high as 211 dB (Caltrans 2005) and no statistically significant mortality at sound exposure levels (SEL) as high as 182 dB (re: dB re 1μPa2 sec) (Caltrans 2004). Interim

recommendations by Popper et al. (2006) suggest using a combined single strike criteria for pile driving noise: a peak sound pressure of 208 dB (re: 1 µPapeak) and an SEL of 187 dB (re: dB re 1µPa2 sec).

Pile driving will occur on the banks of SLO Creek at the Highway 101 overcrossing and at the SLO Creek bridge (Figure 1-2) with an impact hammer. All piles will be driven during the construction window of June 1 to October 31, avoiding adult spawning migration and peak smolt emigration times. Approximately 500–650 strikes/pile will be needed to drive the pile into the substrate. Piles may need to be repositioned and time between driving events can range from 5 to 30 minutes. At San Luis Obispo Creek, five piles per day will be driven, taking approximately 15 days to complete. On Prefumo Creek at Highway 101 over crossing, pile driving will take approximately 20 days to complete. Anticipated pile driving noise impacts will be 93dB $l_{eq,}$ 50 feet from the pile driving equipment. Noise thresholds will be below the 211 dB level that causes injury to juvenile steelhead.

SLO Creek Bridge:	Abutment	1 = 16 piles 40 feet long each
	Pier	2 = spread footing, no piles
	Pier	3 = spread footing, no piles
	Abutment	4 = 16 piles 40 feet long each
Over crossing:	Abutment	1 = 16 piles 40 feet long each
	Bent	2 = 30 piles 40 feet long each
	Bent	3 = 30 piles 40 feet long each
	Abutment	4 = 16 piles 40 feet long each

Potential disturbance and injury of steelhead will be avoided or minimized by completing all in-water work within the summer low-flow season when fish are least likely to occur within the footprint of the project. However, the potential exists for juvenile steelhead to be present within the footprint of the project and subject to potential injury or mortality from construction activities (e.g., dewatering). The exclusion, capturing, handling, and relocation of fish can cause stress, injury, or mortality if not conducted properly. Potential effects will be temporary and should be limited to a relatively small portion of the total stream population of juvenile steelhead. The number of juveniles that will be subject to disturbance and injury will be small and not likely to have measurable effects on abundance or production. Except for pile driving and capturing and relocating fish, actions implemented next to streams may disturb fish but are unlikely to result in direct injury or mortality. Disturbance may result from the temporary movement of construction equipment and personnel, use of temporary lighting, removal of riparian vegetation, grading, and construction of access roads and staging areas. Direct injury and disturbance of fish is most likely to occur during in-water work. Several project actions include in-water work such as:

- removal and disturbance of aquatic vegetation,
- removal of sediment and debris from the stream channel,
- extension of culverts and bridges,
- installation of cofferdams,

- pile driving, and
- capture and handling of fish.

The effect of disturbance on fish depends on the sensitivity of the species life stage and on the duration and frequency of disturbance. Disturbance may reduce feeding, interfere with reproduction, and cause movement from habitat. Movement could result in mortality attributable to predation. Fish capture and relocation may cause mortality due to handling stress.

Disturbance and direct injury would be minimized through implementation of avoidance and minimization measures described above.

4.4.1.4 Cumulative Effects

Cumulative impacts would result from planned growth and would contribute to several potential adverse effects related to south-central California coast steelhead, including:

- loss of habitat for listed species;
- altered hydrology, affecting vernal pools, wetlands, and marshes;
- increased soil erosion and sedimentation;
- potential degradation of surface water and groundwater quality; and
- increased storage of and exposure to hazardous materials.

However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on this listed species.

4.4.2 Critical Habitat

Critical habitat was redesignated for south-central California coast steelhead by NOAA Fisheries (70 FR 52574, September 2, 2005). San Luis Obispo, Prefumo, and Froom Creeks are included in the critical habitat designation.

4.4.2.1 Survey Results

The proposed project is located within the critical habitat designation for south-central California Coast steelhead.

4.4.2.2 Avoidance and Minimization Efforts

Implementation of Measures BIO-18, 19, 23, and 24 (described above in *Section 4.4.1.2 Avoidance and Minimization Measures*), would minimize construction related effects on critical habitat occurring in San Luis Obispo Creek and Prefumo Creek within the study area.

4.4.2.3 Project Impacts

San Luis Obispo Creek provides migratory, rearing and possibly spawning habitat in the study area. Prefumo Creek provides migratory and possibly rearing habitat for steelhead in the study area. Impacts to critical habitat would be the same the species effects described above in *Section*

5.1.1.3, Project Effects, and are summarized below as a sub-set of habitat-related effects of the action that were discussed more fully above.

Freshwater Rearing Sites

Water quantity and quality – Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Any water quality effects associated with sedimentation and turbidity and hazardous materials and contaminants on critical habitat will be temporary. Potential adverse effects of increased fine sediment and turbidity on critical habitat will be avoided or minimized through implementation of all applicable avoidance and minimization measures. Implementation of the SWWPP or WPCP in accordance with the General Permit along with applicable BMPs will substantially reduce or eliminate the potential adverse effects of turbidity and suspended sediment on critical habitat. The potential environmental effects of project actions will be limited to short-term, localized, and minor increases in turbidity and suspended sediment during construction.

BMPs will be implemented to avoid or minimize the potential for accidental spills and unintentional discharge of contaminants into streams and other water bodies. BMPs will also minimize or avoid the potential for spills to drainage channels and ditches that may not be considered critical habitat, but potentially convey runoff to downstream waters that are designated critical habitat. Implementation of the BMPs in accordance with an approved SWWPP or WPCP will substantially reduce or eliminate the potential for accidental spills or unintentional discharges of potentially hazardous materials to streams and other water features that potentially could convey runoff to downstream waters. The potential for a project action to affect water quality, and affect critical habitat, will be avoided or minimized through incorporation of BMPs and conservation measures.

Avoidance and minimization measures will be implemented to avoid or minimize changes in water temperature. These measures focus on preservation and avoidance of existing riparian vegetation, with special emphasis on the protection of large streamside trees, shrubs, and instream woody material that may contribute significantly to stream shade and bank stability at the project site. To the extent practicable, avoidance measures will extend to the entire riparian zone and seek to maintain the area, density, and continuity of the vegetative canopy along the entire length of the site. With implementation of the measures, measurable long-term increases in water temperatures are not expected from changes in canopy coverage, channel width, and depths at the project site. The potential exists for short-term increases in water temperature during the establishment and growth of planted native vegetation but these increases are not likely to measurably affect rearing juveniles.

Floodplain connectivity – Project activities related to the removal of accumulated sediments in the vicinity of the LOVR bridge at San Luis Obispo Creek would restore floodplain connectivity at this location. Floodplain connectivity at other locations within the study area will not be changed by the proposed action.

Forage – Project activities could affect steelhead forage by removing riparian and SRA cover and disturbing channel substrates, thereby decreasing the abundance of aquatic insects (a prey item for fish) or their availability to juvenile steelhead. In addition, channel substrate would be

disturbed by construction activities; however, all in-channel substrate removed as part of project activities would be replaced onsite immediately following project construction and before the following spawning season. Riparian vegetation and SRA cover provide attachment sites for aquatic insects which then can drop into the stream and be available to foraging fish, while channel substrates are important food-producing area in streams, especially in riffle habitats. However, most riparian and overwater vegetation impacts will be temporary, and mitigation measures would ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. In addition, substrates removed during project construction would be stored, and then washed to remove fines before being returned to the channel after construction is completed and before the cessation of the stream diversions. Because of the mitigation measures, the proposed action is not expected to have long-term effects on steelhead forage.

Natural cover – As stated above under "*Forage*", the proposed action would remove riparian and overwater vegetation on San Luis Obispo and Prefumo Creeks. However, most riparian and overwater vegetation impacts will be temporary and mitigation measures will ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. Impacts on natural cover are expected to be short-term (5 to 7 years), as vegetation that is planted or that is naturally recruited at disturbed sites is reestablished.

Avoidance and minimization measures for temporary and permanent losses of riparian vegetation will be implemented to avoid or minimize the loss of cover (Measure 7).

Freshwater Migration Corridors

Water quantity and quality – Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Significant but short-term effects to water quality may occur during construction. Increases in turbidity are likely to be minimal, with water quality protection measures in place. Any increases in turbidity would likely dissipate quickly in time and space. See additional discussion on water quantity and quality above under "*Freshwater Rearing Sites*".

Free passage – Passage in San Luis Obispo and Prefumo Creeks will not be impeded by project activities (equipment operation, pile driving, sediment removal, and stream diversions). The proposed stream diversion will be restricted to the low-flow summer season and will avoid the primary migration period of adult and juvenile (including smolt) steelhead. In addition, the proposed culvert extension on San Luis Obispo Creek will not result in creating an impediment to fish passage because of the large size of the culverts compared to the flow volume that occurs when fish are migrating, and because no new hard surfaces will be added to the channel bottom at any of the stream crossings.

Avoidance and minimization measures will be implemented to avoid or minimize the adverse effects of changes in channel morphology and hydraulics. Implementation of the measures designed to maintain suitable passage conditions at culverts, bridges, and temporary in-channel structures will ensure continued access of adults and juveniles to available spawning and rearing habitat, maintaining function of critical habitat. Similarly, implementation of measures to ensure that any loss of critical habitat elements that support spawning and rearing is avoided or minimized to the greatest extent possible.

Natural cover – As stated above under "*Freshwater Rearing Sites*", the proposed action would remove riparian and overwater vegetation on San Luis Obispo and Prefumo Creeks. However, most riparian and overwater vegetation impacts will be temporary and compensatory measures will ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. Impacts on natural cover are expected to be short-term (5 to 7 years), as vegetation that is planted or that is naturally recruited at disturbed sites is reestablished.

Freshwater Spawning Sites

Water quantity and quality - Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Significant but short-term effects to water quality may occur during construction. Increases in turbidity are likely to be minimal, with water quality protection measures in place. Any increases in turbidity would likely dissipate quickly in time and space. See additional discussion on water quantity and quality above under "*Freshwater Rearing Sites*".

Spawning gravel quantity and quality – Project activities associated with bridge widening (e.g., excavation, pile driving, heavy equipment operation) would remove and potentially degrade existing spawning habitat in San Luis Obispo Creek. These activities would occur during the summer low precipitation period and would avoid the adult spawning and egg incubation period.

Substrate, including gravel supporting spawning habitat, that is removed during project construction will be set aside, washed to remove fines, and then returned to the channel following completion of project construction. If it is determined that a net loss in spawning gravel area occurs as a result of project construction, the City will augment gravels in the construction area with appropriately-sized spawning gravels (0.5 inch to 3.0 inches). The proposed removal of accumulated sediments in the vicinity of and under the LOVR bridge would not affect spawning habitat in San Luis Obispo Creek. These accumulated sediments consist of finer substrate materials that exist on the floodplain and, therefore, are unsuitable as spawning habitat. The replacement, and augmentation (if needed), of affected spawning gravels at the end of the first construction season would ensure that these gravels would be suitable and available to adult steelhead the following winter, and that there would be no net loss of spawning habitat in the study area from the proposed action.

Water quality protection measures would avoid and minimize the potential to degrade spawning habitat by preventing erosion of disturbed soils, and by preventing sediment-laden runoff from entering watercourses.

4.4.2.4 Compensatory Mitigation

No compensatory mitigation for south-central California Coast steelhead is recommended based on the avoidance and minimization measures incorporated into the project design.

On-site mitigation will be implemented to the extent possible. Any remaining impacts that cannot be mitigated on-site will be mitigated at a currently undetermined environmentally-approved off-site location, such as the City-owned Johnson Ranch or through the San Luis Land Obispo Conservancy.

4.4.2.5 Cumulative Impacts

The proposed project will not contribute to cumulative adverse impacts to critical habitat because any permanent habitat removal (SRA) will be mitigated with Mitigation Measure BIO-3. Implementation of Measures BIO-18, 21, 23, and 24 (described above in *Section 4.4.1.2 Avoidance and Minimization Measures*), would minimize construction related effects on critical habitat occurring in San Luis Obispo Creek and Prefumo Creek within the study area.

4.5 Other Biological Issues

4.5.1 Native Trees

4.5.1.1 Survey Results

Native trees occur in the study area throughout the riparian forest community. These trees are not mapped individually, but are within the mapped communities presented in Figure 3-1.

Native trees are considered sensitive locally because of their biological and aesthetic value. The project area contains native trees protected by the City's tree regulations.

4.5.1.2 Avoidance and Minimization Measures

Implementation of avoidance and minimization measures described under section 4.1.1, "Riparian Forest" would ensure that the proposed project minimizes direct and indirect effects on native trees adjacent to the construction area.

4.5.1.3 Project Impacts

Construction of the project would result in the permanent loss of native trees within the riparian forest (Alternatives 3 and 6) community within the project footprint. Under both alternatives, trees within the riparian forest would also be temporarily disturbed during project construction. Trees adjacent to the construction area could sustain damage from equipment. Implementation of the avoidance and minimization measures would protect trees and avoid this potential impact.

Under the City tree ordinance, replacement of removed native trees would be required. The loss or disturbance of native trees is considered adverse because they provide a variety of important ecological functions and values.

4.5.1.4 Compensatory Mitigation

Implementation of Mitigation Measures BIO-2 and BIO-3 for riparian forest would address the impacts on native trees. No additional mitigation is recommended.

4.5.1.5 Cumulative Impacts

Cumulative impacts on native trees would result from construction of other general development projects in San Luis Obispo County. Construction of the proposed project would add to the cumulative loss of native trees. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on native trees.

4.5.2 Invasive Species

Invasive species are plant species designated as federal noxious weeds by USDA, species listed by CDFA, and invasive plants identified by Cal-IPC. Roads, highways, and related construction projects are some of the principal dispersal vectors for invasive species. The introduction and spread of invasive plants adversely affect natural plant communities by displacing native plant species that provide shelter and forage for wildlife species.

A national invasive weed list has not yet been approved, but FHWA requires that state departments of transportation use the state's noxious weed list (California Department of Food and Agriculture 2004) in the interim. Accordingly, the CDFA and Cal-IPC lists were used for the analysis of invasive species in the study area.

4.5.2.1 Survey Results

Table 3-2 identifies the invasive species from the CDFA and Cal-IPC lists found in the study area. The infestation of the study area by these species is limited. Infestations occur primarily on isolated patches of ruderal vegetation on the edges of roadways or within riparian forest habitat.

4.5.2.2 Avoidance and Minimization Measures

Implementation of the following measure would avoid and minimize the introduction and spread of invasive plants during construction.

Measure BIO-25: Avoid the Introduction and Spread of Invasive Plants

The City's contractor shall be responsible for avoiding the introduction of new invasive plants and the spread of invasive plants previously documented in the study area. Accordingly, the following measures shall be implemented during construction:

- Construction supervisors and managers will be educated about invasive plant identification and the importance of controlling and preventing the spread of invasive plant infestations.
- Surface disturbance within the construction work area will be minimized to the greatest extent possible.
- All disturbed areas will be seeded with certified weed-free native mixes and mulched with certified weed-free mulch (rice straw may be used in upland areas).
- Native, non-invasive species will be used in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.

4.5.2.3 Project Impacts

Invasive weed species in the study area are present along roadsides, which are routinely disturbed by shoulder maintenance and vegetation management activities. The proposed project would create additional disturbed area for a temporary period, but it would not substantially increase the area subject to repeated disturbance because the new road shoulders would replace existing road shoulders. Isolated stands of invasive weeds, such as giant reed and bigleaf periwinkle, occur in riparian forest habitat along the creeks. Implementation of the avoidance and minimization measures described above would avoid potential impacts of invasive plants. Therefore, the proposed project is not anticipated to either increase or decrease the area currently

occupied by invasive weeds or the potential for spreading invasive weed species. No further mitigation is proposed.

4.5.2.4 Cumulative Impacts

Cumulative impacts caused by the spread of invasive weed species would result from construction of general development projects in San Luis Obispo County. With implementation of the mitigation measures prescribed for minimizing impacts, the proposed project would avoid cumulatively adverse effects related to the spread of invasive weed species.

Chapter 5 Results: Permits and Technical Studies for Special Laws or Conditions

Applicable federal and state permits and approvals that could be required before construction of the proposed project are listed in Table 5-1.

Table 5-1. Permits and Approvals Potentially Required for the Proposed Project

Permit/Approval	Approving Agency	Permit/Approval Required?		Comments
		Yes	No	
Endangered Species Act Section 7: Consultation and Incidental Take Permit	U.S. Fish and Wildlife Service and National Marine Fisheries Service	X		Obtain a BO or concurrence letter from NOAA Fisheries for potential impacts on south-central California Coast steelhead and obtain a BO or concurrence letter from USFWS for potential impacts on CRLF.
Clean Water Act Section 401: Water Quality Certification	Central Coast Regional Water Quality Control Board	X		Apply for water quality certification.
Clean Water Act Section 404: Placement of Fill	U.S. Army Corps of Engineers	X		Apply for nationwide permit from the U.S. Army Corps of Engineers.
Land Use Agreement (Lease)	State Lands Commission		X	No lease required from the State Lands Commission.
Rivers and Harbors Act Section 9	U.S. Coast Guard		X	No navigable waters, not required.
California Fish and Game Code Section 1602	California Department of Fish and Game	X		Apply for streambed alteration agreement.
Executive Order 13112: Prevention and Control of Invasive Species	Federal Highway Administration	X		Mitigation identified in Chapter 4 satisfies requirement.
Executive Order 13186: Migratory Bird Treaty Act	Federal Highway Administration	X		Mitigation identified in Chapter 4 satisfies requirement.

A summary of consultation and coordination efforts related to the listed permits and approvals is provided below.

5.1 Federal Endangered Species Act Consultation Summary

CRLF is a federally listed species that may be affected by the proposed project although no critical habitat for this species is present within the project area. The proposed project incorporates the avoidance and minimization measures for CRLF provided within the Programmatic Biological Opinion for Projects Funded or Approved under the Federal Aid Program [HAD-CA, File #: Section 7 within the Ventura U.S. Fish and Wildlife Service (USFWS), Document 3: S38192] (1-8-02-F-68). However, the USFWS, in conjunction with Caltrans, will determine whether the proposed project may be appropriately considered under the Programmatic Biological Opinion. South-Central California Coast Steelhead is a second

federally-listed species that may be affected by the proposed project. Consultation for federally-listed anadramous fish is under the jurisdiction of NOAA Fisheries and is also discussed below.

5.2 Federal Fisheries and Essential Fish Habitat Consultation Summary

The proposed project has potential to affect the federally-listed south-central California Coast steelhead and its Critical Habitat. At this time, consultation with NOAA Fisheries has not been initiated for the proposed project. A BA addressing potential project affects on south-central California Coast steelhead has been prepared for the proposed project (Appendix B). Submittal of the BA to NOAA Fisheries is pending.

5.3 California Endangered Species Act Consultation Summary

The proposed project will not result in take of a state-listed species. Therefore, no CESA coordination is required.

5.4 Wetlands and Other Waters Coordination Summary

A preliminary delineation of waters of the United States in the study area has been prepared for the proposed project (Appendix B). Based on the survey methodology described above, the Los Osos Valley Road/U.S. 101 Interchange study area contains a total of 4.01 acres of waters of the United States). This acreage includes 1.75 acres of potential jurisdictional other waters of the United States and 1.32 acres of potential jurisdictional wetlands. In addition to potential jurisdictional features, 0.84 acres of non-jurisdictional wetlands and 0.10 acres of non-jurisdictional drainages were also delineated in the study area. Submittal of the report to the Corps and subsequent verification is pending.

5.5 Invasive Species

The proposed project will not result in severe infestations of invasive plant species. Therefore, no coordination with the San Luis Obispo County Agricultural Commission is required.

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Appendix A Wetland Delineation Report

Preliminary Delineation of Waters of the United States, Including Wetlands, for the Los Osos Valley Road/U.S. 101 Interchange Improvements Project, San Luis Obispo, California

October 2007

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Exhibit A Wetland Delineation Map

Preliminary Delineation of Waters of the United States, Including Wetlands, for the Los Osos Valley Road/U.S. 101 Interchange Improvements Project, San Luis Obispo, California

Summary

This report presents the results of a delineation of waters of the United States, including wetlands, conducted for the Los Osos Valley Road/U.S. 101 Interchange (Project) site in San Luis Obispo, California. On May 10–11 and July 19, 2006, a Jones & Stokes botanist and wetland ecologist delineated waters of the United States to determine the location and extent of areas that would likely be subject to regulation under Section 404 of the Clean Water Act (CWA). The delineation was conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual*. A total of 1.75 acres of potential jurisdictional other waters of the United States and 1.32 acres of potential jurisdictional wetlands was delineated in the study area, for a grand total of 3.07 acres of waters of the United States. In addition to potential jurisdictional features, 0.84 acres of non-jurisdictional wetlands and 0.10 acres of non-jurisdictional drainages were also delineated in the study area. All other features are tributary to San Luis Obispo Creek, which flows to San Luis Obispo Bay, a navigable water of the United States.

Two relatively recent federal rulings (January 9, 2001; *Solid Waste Agency of Northern Cook County* [SWANCC] *v. United States Army Corps of Engineers* [121 S.CT.675, 2001]) and (June 19, 2006; *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*) may affect whether wetlands and other waters in the study area are considered jurisdictional under Section 404 of the CWA. Additional information on these decisions can be found below in the *Recent Regulatory Considerations* section. In the absence of any formal guidance from the USACE or EPA on the recent Rapanos decision, wetlands and waters delineated in the study area were considered potentially jurisdictional in this report because they are adjacent to San Luis Obispo Creek, a tributary of a navigable waterbody (i.e., San Luis Obispo Bay).

The jurisdictional status of the features mapped and presented in this report is preliminary and subject to verification by the U.S. Army Corps of Engineers (Corps), Los Angeles District.

Purpose and Need

The purpose of the proposed project is to improve traffic operations and safety on Los Osos Valley Road and the Los Osos Valley Road//U..S. 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to be designed such that it will not preclude the planned ultimate widening of U.S. 101 or future interchange improvements.

Project Description

The project limits extend along Los Osos Valley Road between Auto Park Way to the west and South Higuera Street to the east and along U.S. 101 for approximately 2,500 feet south and 4,300 feet north of the Los Osos Valley Road overcrossing, covering a distance of 0.52 miles. The proposed project involves widening the existing freeway bridge and an adjacent bridge crossing San Luis Obispo Creek, and the possible relocation and reconfiguration of the freeway ramps depending on the alternative chosen. This project is intended to accommodate current and future travel demands. Calle Joaquin Road south of Los Osos Valley Road is being realigned such that the existing “T” intersection of Los Osos Valley Road and Calle Joaquin Road north of Los Osos Valley Road will be converted to a four-legged intersection. The Calle Joaquin Road realignment is currently being developed by the Costco Wholesale Corporation as a condition of approval and mitigation measure for traffic impacts. The realignment is scheduled for completion prior to initiation of interchange improvements.

Description of General Site Conditions

The project site is located southwest of the downtown San Luis Obispo at the junction of Los Osos Valley Road and U.S. 101. The project study area for the purposes of this delineation encompasses approximately 62 acres and is depicted in Exhibit A. The study area is within the outer South Coast Range geographic subdivision of the Central Western Region in the California Floristic Province (Hickman 1993). The study area is in San Luis Obispo County within the San Luis Obispo and Pismo Beach 7.5-minute U.S. Geological Survey (USGS) quadrangles. In the San Luis Obispo quadrangle the study area is in both an unnamed section and Section 3, Township 31 south, Range 12 east. The portion of the study area located in the Pismo Beach quadrangle is in both an unnamed section and Section 10, Township 31 south, Range 12 east. Elevations in the study area are approximately 100 to 120 feet above sea level (Figure 1).

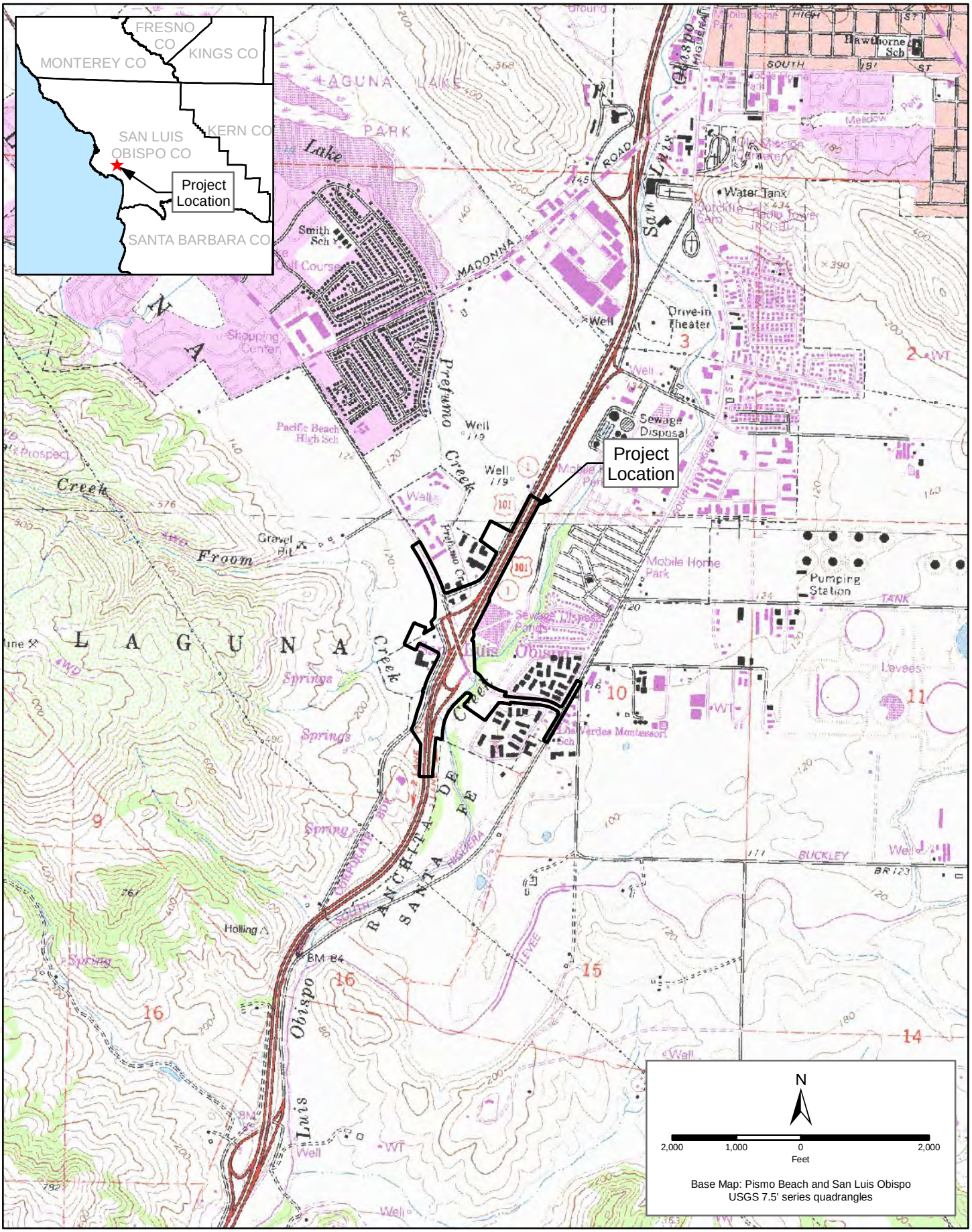

Figure 1
Project Location

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Approximately one-half of the study area is located along or adjacent to U.S. 101 and one-half occurs along or adjacent to Los Osos Valley Road. The topography of the study area is relatively level.

Photographs of the study area and representative wetland features are provided in Appendix A.

Vegetation

The following community types were observed in the study area: riparian forest, nonnative annual grassland, agricultural, ruderal, developed/landscape, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage. Of these, freshwater marsh, seasonal drainage, and perennial drainage are potential jurisdictional waters of the United States. Each of the eleven community types is described in the "Results" section below.

Hydrology

The study area is located in the Central Coastal hydrologic unit. Hydrologic units correspond to the natural division between watershed boundaries and are based on the U.S. Environmental Protection Agency's (EPA's) hydrologic unit maps (U.S. Environmental Protection Agency 2004). The climate in the study area is characterized by hot, dry summers and cool, moist winters; the mean annual precipitation is 14–25 inches, and the mean annual air temperature is 58ºF. San Luis Obispo Creek is the major stream in the study area and flows into San Luis Obispo Bay. Two other streams in the study are, Prefumo Creek and Froom Creek, are tributaries to San Luis Obispo Creek.

Soil Characteristics

Soils in the study area are shown in Figure 2 and are described in Table 1. The study area is located on five soil map units: Concepcion loam, 2–5% slopes, Cropley clay, 0–2% slopes, Los Osos-Diablo complex, 15–30% slopes, Salinas silty clay loam, 0–2% slopes, and Xererts-Xerolls-Urban land complex, 0–15% slopes (Ernstrom 1984). Concepcion loam, 2–5% slopes, is a moderately well-drained soil on marine terraces formed in old alluvium weathered from sedimentary rocks; this soil does not contain hydric components or inclusions (Ernstrom 1984; Soil Conservation Service 1992). Cropley clay, 0–2% slopes, is a moderately well-drained soil on alluvial fans and plains formed in alluvium weathered from sedentary rocks; the primary component of this soil is not hydric but it contains a hydric inclusion (Ernstrom 1984; Soil Conservation Service 1992). Los Osos-Diablo complex, 15–30% slopes, is a well-drained soil on foothills and mountains formed in residual material weathered from sandstone or shale; this soil does not contain hydric components or inclusions (Ernstrom 1984; Soil Conservation Service 1992). Salinas silty clay loam, 0–2% slopes, is a well-

drained soil on alluvial fans and plains formed in alluvium weathered from sedentary rocks; the primary component of this soil is not hydric but it contains a hydric inclusion (Ernstrom 1984; Soil Conservation Service 1992). Xererts-Xerolls-Urban land complex, 0–15% slopes, consists of soil materials that have been covered by urban structures or altered by earthmoving equipment to such an extent that their original shape and physical characteristics have been modified (Ernstrom 1984; Soil Conservation Service 1992). The primary components of Xererts-Xerolls-Urban land complex, 0–15% slopes, are not hydric, but an unnamed inclusion is hydric.

Table 1. Soil Map Units in the Study Area

Mapping Unit	Mapping Unit Symbol[a]	Drainage	Landform	Hydric Soils[a]	Hydric Criteria[b]
Concepcion loam, 2–5% slopes	120	Moderately well-drained	Marine terraces	Does not contain hydric components or inclusions	N/A
Cropley clay, 0–2% slopes	127	Moderately well-drained	Alluvial fan	Unnamed (inclusion)	2B3
Los Osos-Diablo complex, 15–30% slopes	164	Well-drained	Foothills and mountains	Does not contain hydric components or inclusions	N/A
Salinas silty clay loam, 0–2% slopes	197	Well-drained	Alluvial fan	Camarillo (inclusion)	2B3
Xererts-Xerolls-Urban land complex, 0–15% slopes	221	Not defined;[a] altered physical characteristics	Not defined;[a] altered physical characteristics	Unnamed (inclusion)	2A

[a] Sources: Ernstrom 1984; U.S. Soil Conservation Service 1992.

[b] The hydric soil criteria are defined as follows (from U.S. Soil Conservation Service 1992):

Hydric Criteria 2A & 2B3:

2. Soils in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, Pell great groups of Verticols, Pachic subgroups, or Cumulic subgroups that are:

   A. somewhat poorly drained and have a frequently occurring water table at less than 0.5 feet from the surface for a significant period (usually more than 2 weeks) during the growing season, or

   B. poorly drained or very poorly drained and have

      3. A frequently occurring water table at less than 1.5 feet from the surface for a significant period (usually more than 2 weeks) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches.

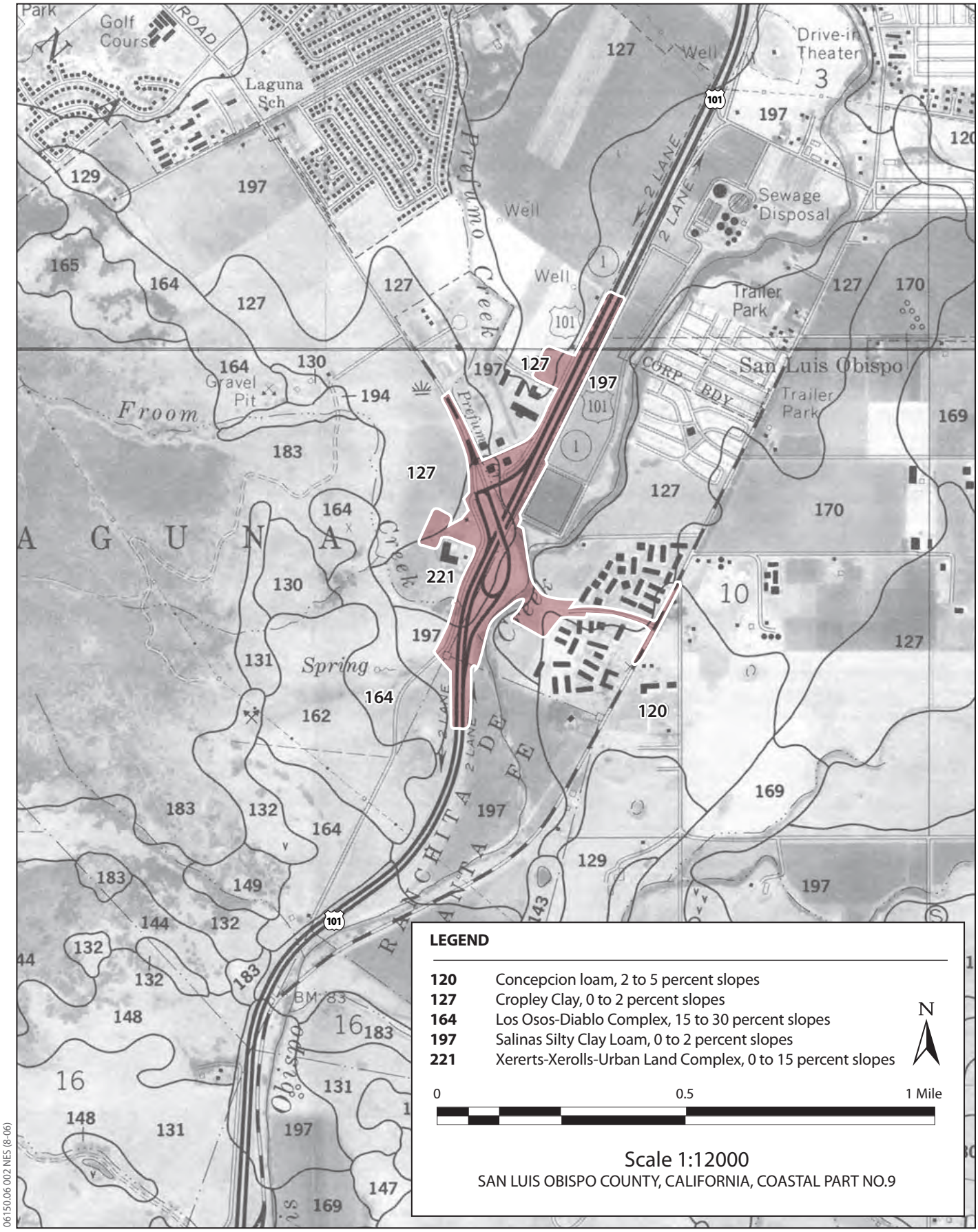

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Figure 2
Soils Map

Terminology

This section presents definitions of terminology specific to delineations of waters of the United States.

According to the definition in the Code of Federal Regulations (CFR), *waters of the United States* are

1. all waters which are currently used, or were used in the past, or may be susceptible to use of interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. all interstate waters, including interstate wetlands;
3. all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters…;
4. all impoundments of waters otherwise defined as waters of the United States under the definition;
5. tributaries of waters identified in bullets (1)–(4) of this section;
6. the territorial seas; and
7. wetlands adjacent to waters (other than waters that are themselves wetlands) identified in bullets (1)–(6) of this section. (33 CFR § 328.3.)

Waters of the United States are areas under federal jurisdiction pursuant to Section 404 of the CWA. For the purpose of this delineation report, waters of the United States are divided into *wetlands* and *other waters of the United States*.

High tide line refers to the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris in the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gauges, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm (33 CFR § 328.3[e]).

Other waters of the United States are seasonal or perennial water bodies—including lakes, stream channels, drainageways, ponds, and other surface water features—that exhibit an ordinary high water mark (OHWM) but lack positive indicators for one or two of the three wetland parameters (33 CFR § 328.4). Nontidal drainage and irrigation ditches excavated on dry land generally are not

considered waters of the United States, but this determination is made by the Corps on a case-by-case basis (51 FR 41217, November 13, 1986).

Wetlands are "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR § 328.3[b], 40 CFR § 230.3). To be considered subject to federal jurisdiction, a wetland must normally support hydrophytic vegetation, hydric soils, and wetland hydrology (Environmental Laboratory 1987).

Adjacent is defined as "bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands'" (33 CFR § 328.3[3]).

Dominance is a descriptor of vegetation related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees). A dominant plant species exerts a controlling influence on or defines the character of a vegetation community. Measurements of percentage of areal cover are often used to determine a species' dominance (Environmental Laboratory 1987).

Frequently flooded is a flooding class in which flooding is often likely to occur under normal weather conditions (i.e., more than 50% chance of flooding in any year or more than 50 times in 100 years) (Environmental Laboratory 1987).

Growing season is the portion of the year when the soil temperature at 19.7 inches below the soil surface is above biological zero (41ºF or 5ºC). This period can be easily determined by estimating the number of frost-free days in a year (Environmental Laboratory 1987).

Hydric soils are formed during the growing season under conditions of saturation, flooding, or ponding of sufficient duration to develop anaerobic conditions in the upper part of the soil (Environmental Laboratory 1987; Natural Resources Conservation Service 1998).

Long duration is the period of inundation for a single event and may range from 7 days to 1 month (Environmental Laboratory 1987).

The *normal condition* is the periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years per 100 years that the soil is inundated or saturated at least once during part of the growing season (Environmental Laboratory 1987).

Redoximorphic features are soil properties formed by oxidation, translocation, or reduction of iron or manganese oxides. Redoximorphic features indicate past or present prolonged soil saturation and were formerly known as mottles, concretions, soft masses, and low-chroma colors (Vepraskas 1992). Chroma is a measure of the intensity of a color as related to greyness. Low-chroma colors are more grey.

An area has *wetland hydrology* "if it is inundated or saturated to the surface continuously for at least 5% of the growing season in most years (i.e., 50% probability of recurrence)" (Environmental Laboratory 1987). Primary indicators of wetland hydrology include drainage patterns, drift lines, sediment deposits, watermarks, drainage patterns within wetlands, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation. Secondary indicators of wetland hydrology include presence of oxidized rhizospheres associated with living plant roots in the upper 12 inches of the soil, presence of water-stained leaves, local soil survey hydrology data for identified soils, and the FAC-neutral test of the vegetation.

Wetland indicator status denotes the probability that a particular plant species will occur in habitats qualifying as wetlands. Indicator status categories were originally developed and defined by the U.S. Fish and Wildlife Service National Wetlands Inventory and subsequently modified by the National Plant List Panel (Environmental Laboratory 1987; Reed 1988).

Wetland indicator status categories are defined by the following characteristics.

- Obligate (OBL)—almost always occurs in wetlands (>99% probability).
- Facultative wetland (FACW)—usually occurs in wetlands (67–99% probability).
- Facultative (FAC)—equally likely to occur in wetlands or nonwetlands (34–66% probability of occurrence in wetlands).
- Facultative upland (FACU)—usually occurs in nonwetlands but occasionally occurs in wetlands (1–33% probability).
- Obligate upland (UPL)—almost never occurs in wetlands (<1% probability).
- No indicator (NI)—information is lacking.

A positive (+) or negative (-) sign is used with the wetland indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands), and a negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands).

Recent Regulatory Considerations

Although features delineated in the study area may meet the criteria necessary to be considered wetlands or waters under the USACE's definition, two relatively recent federal rulings can affect whether waters and wetlands in the delineation study area are regulated by the USACE under the CWA. A brief summary of each of these decisions is provided below.

SWANCC Decision

A 2001 federal ruling (January 9, 2001; *Solid Waste Agency of Northern Cook County* [SWANCC] *v. United States Army Corps of Engineers* [121 S.CT.675, 2001]) can affect whether wetlands on a particular project site are considered jurisdictional by USACE. Guidance on nonnavigable, isolated [and] intrastate waters was published on January 19, 2001, by Counsel for the U.S. Environmental Protection Agency and USACE in response to the SWANCC ruling. The ruling effectively precluded the U.S. Environmental Protection Agency (EPA) and USACE from asserting CWA jurisdiction over isolated waters that are both intrastate and non-navigable where the sole basis for asserting jurisdiction is the actual or potential use of the waters as habitat for migratory birds that cross state lines in their migrations. As a result, EPA and USACE must now demonstrate that such waters have an alternate link to interstate or foreign commerce, or that they are tributary or *adjacent* to a navigable water in order to assert CWA jurisdiction.

Rapanos Decision

A federal ruling on two consolidated cases (June 19, 2006; *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*), referred to as the Rapanos decision, affects whether some waters or wetlands are considered jurisdictional under the CWA. In these cases, the U.S. Supreme Court reviewed the USACE definition of *waters of the United States* and whether or not it extended out to tributaries of navigable waters or wetlands adjacent to those tributaries. The decision provided two standards for determining jurisdiction of water bodies that are not TNWs: 1) if the non-TNW is a RNW or is a wetland directly connected to a RNW, or 2) if the water body has “significant nexus” to a TNW. The significant nexus definition is based on the purpose of the CWA (“restore and maintain the chemical, physical, and biological integrity of the Nation’s waters”).

Guidance issued by EPA and USACE on the Rapanos decision requires application of the two standards and use of substantially more documentation to support a jurisdictional determination (JD) for a water body. The guidance also resulted in development of an expanded JD form.

Delineation Methods

Review of Existing Information

The following information was reviewed for this delineation:

- USGS 7.5-minute topographic map;
- aerial photographs of the study area (flown in 2005);

- San Luis Obispo County soil survey information;
- wetland assessment completed for Calle Joaquin realignment project (Morro Group, Inc. 2004); and
- Jones & Stokes project files.

Jones & Stokes botanist and wetland ecologist Lisa Webber conducted the onsite delineation of waters of the United States, including wetlands, on May 10–11 and July 19, 2006. A total of 11 data forms was completed for the study area and are included in Appendix B. Three features included in the results section were previously mapped (Morro Group, Inc. 2004). These features were examined during the onsite surveys to confirm the mapped boundaries. No additional data forms were completed in those areas.

Wetland Indicators

Determination of Hydrophytic Vegetation

The presence of hydrophytic vegetation was determined using the method outlined in the online edition of the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Under this method, areas are considered to have positive indicators of hydrophytic vegetation if more than 50% of the dominant plant species (defined as plants that comprise 20% or more of the cover value observed at a site) are FAC, FACW, or OBL species (50/20 rule).

Determination of Wetland Hydrology

To determine whether an area meets the wetland hydrology criterion, the 1987 Manual modified a hydrologic classification system for nontidal areas based on periods of inundation or soil saturation. According to this classification system, areas that are inundated less than 5% of the growing season (15 days in the study area) are not wetlands. Areas that are regularly inundated or saturated between 5% and 12.5% (38 days in the study area) of the growing season are sometimes wetlands. Estimates of the growing season (approximately 308 days in the study area) are based on the soil survey of the coastal part of San Luis Obispo County (Ernstrom 1984).

Wetland hydrology was inferred if a sample plot exhibited one or more of the following characteristics:

- landscape position and surface topography that would support wetland habitat (e.g., depressional topography, position of the site relative to an upslope water source);
- residual evidence of ponding or flooding (e.g., algal mats, sediment deposits)

Determination of Hydric Soils

If the sample plot supported a prevalence of hydrophytic vegetation, soils were evaluated using the Munsell soil color chart, hand texturing, and assessment of diagnostic soil features (e.g., oxidized root channels, amount of organic matter in the soil profile). Hydric soils were considered to be present if soils had a low-chroma matrix or a matrix chroma of ≤ 2 with redoximorphic features (mottles).

Jurisdictional Boundary Determinations, Wetland Mapping, and Acreage Calculations

In general, the wetland-upland boundary was determined based on the presence or inference of positive indicators of wetland criteria. In most cases, the boundary was initially identified based on observed hydrophytic vegetation and wetland hydrological conditions. Soils with hydrophytic vegetation were evaluated; if they exhibited hydric characteristics, they were subsequently compared to those in an adjacent area with upland vegetation to evaluate the differences in soils and distinguish whether the wetland site was indicative of hydric soil conditions.

After each potential jurisdictional wetland boundary was identified, it was recorded using a GeoXT global positioning system (GPS) receiver and post-processed using Trimble Pathfinder Office 3.1. Acreage of each wetland feature was calculated in the ArcGIS program. Data was subsequently overlaid onto the aerial photo base to prepare the delineation map.

Field Delineation Methods for Other Waters of the United States

The boundary for other waters (i.e., the Ordinary High Water Mark [OWHM]) was determined in the field on the basis of observed physical characteristics such as natural lines impressed on the bank, shelving, destruction of terrestrial vegetation, the presence of litter and debris, and other evidence as defined in recent regulatory guidance (U.S. Army Corps of Engineers 2005).

Results

Based on the survey methodology described above, the Los Osos Valley Road/U.S. 101 Interchange study area contains a total of 4.01 acres of waters of the United States (Table 2). This acreage includes 1.75 acres of potential jurisdictional other waters of the United States and 1.32 acres of potential jurisdictional wetlands (Table 2). In addition to potential jurisdictional features, 0.84 acres of non-jurisdictional wetlands and 0.10 acres of non-jurisdictional drainages were also delineated in the study area (Table 3). Descriptions of the

vegetation, soil, and hydrologic characteristics of the potential jurisdictional areas within the study area are presented below. Exhibit A shows locations of potential jurisdictional features. The nonwetland habitats in the study area, riparian forest, nonnative annual grassland, ruderal, agricultural, and developed/landscape are also described below.

Table 2. Acreage Summary of Jurisdictional Wetlands and Waters of the United States by Type

Waters	Type		Total
Freshwater Marsh	Wetland	1.07	
Seasonal Wetland	Wetland	0.25	
Wetland			1.32
Seasonal Drainage	Other Waters of the U.S.	0.19	
Perennial Drainage	Other Waters of the U.S.	1.56	
Other Waters of the U.S.			1.75
Total			**3.07**

Table 3. Acreage Summary of Non-jurisdictional Wetlands and Drainages by Type

Waters	Type		Total
Freshwater Marsh	Wetland	0.24	
Seasonal Drainage	Drainage	0.10	
Seasonal Wetland	Wetland.	0.60	
Total		**0.94**	

Jurisdictional Wetlands and Other Waters of the United States

Freshwater Marsh

The study area supports one location of freshwater marsh community that may be jurisdictional. This freshwater marsh is located within the approved Calle Joaquin realignment project area in Froom Ranch at the base of the Irish Hills. Froom Creek is approximately 400 feet outside and west of the study area edge and the marsh. The marsh feature is within the floodplain of Froom Creek and is in an area of high ground water (Morro Group, Inc. 2004). This feature has been previously delineated as part of the Calle Joaquin realignment project (Morro Group, Inc. 2004). Portions of the marsh are perennially wet. Dominant plant species include iris-leaved rush, sedges, creeping leather root, coastal silverweed,

bull thistle, birdfoot trefoil, goldentop, and meadow fescue. Dominant plant species in the wettest areas include tule, iris-leaved rush, seep monkeyflower, and watercress. The area of freshwater marsh within the approved Calle Joaquin project area may be considered jurisdictional.

Another freshwater marsh location is discussed below in the non-jurisdictional wetland section.

Seasonal Drainage

Several seasonal drainages traverse the study area, including Froom Creek and two unnamed seasonal drainages that drain to Froom Creek. Froom Creek, an intermittent stream in the study area with a perennial reach upstream,, drains to San Luis Obispo Creek from an underground culvert beneath U.S. 101. Froom Creek supports riparian forest vegetation where it crosses the study area and a combination of eucalyptus and riparian forest vegetation up to approximately 1,000 feet upstream, but is mostly unvegetated in the area further upstream.

The two seasonal drainages have been previously evaluated in a wetland delineation for the Calle Joaquin realignment project, and are referred to as Drainage 1 and Drainage 2 in that delineation (Morro Group, Inc. 2004). Drainage 1 is spring fed and enters an underground culvert at its south end that emerges at the confluence with Froom Creek on the west side of Calle Joaquin. Froom Creek crosses under U.S. 101 at this location to its confluence with San Luis Obispo Creek. Drainage 1 supports riparian forest vegetation, dominated by arroyo willow, dogwood, California bay, Himalayan blackberry, and cattail.

Drainage 2 parallels Los Osos Valley Road and U.S. 101 and is fed by urban runoff. The northern portion of Drainage 2 in the study area floods into the adjacent freshwater marsh under high flow conditions. The southern end of Drainage 2 enters a culvert and drains to Froom Creek. The northern portion of Drainage 2 supports riparian forest vegetation, including arroyo willow, poison hemlock, sweet fennel, teasel, and milk thistle. The southern portion along Calle Joaquin supports scattered arroyo willow and eucalyptus, coyote brush, poison hemlock, a small area of bulrush and cattail, and ruderal herbaceous species.

Froom Creek is a water of the United States and is shown as a blue-line stream on the USGS quadrangle. Drainages 1 and 2 would likely be considered jurisdictional because they drain to Froom Creek, a water of the United States.

Perennial Drainage

Two perennial drainages cross the study area, Prefumo Creek and San Luis Obispo Creek. The perennial drainages cross study area roadways via cement box culverts of varying sizes. Dense riparian forest vegetation borders both creeks throughout the study area and is described below. Prefumo Creek and San Luis

Obispo Creek are waters of the United States and are shown as blue-line streams on the USGS quadrangle.

Non-Jurisdictional Wetlands and Drainages

Freshwater Marsh

A second freshwater marsh is located between U.S. 101 and Calle Joaquin. This feature appears to be perennial, possibly due to high ground water. This marsh appears to be hydrologically isolated from Froom Creek, which would make it a non-jurisdictional feature. Dominant species in this community include narrowleaf cattail, iris-leaved rush, Himalayan blackberry, sneezeweed, and fringed willowherb.

Seasonal Wetland

Seasonal wetland communities in the study area are primarily associated with roadside drainages and basins south of Los Osos Road. Two of the three areas mapped as seasonal wetland in the study area are located in the northbound U.S. 101 on-ramp cloverleaf. These two seasonal wetlands are connected by a culvert under the on-ramp and receive runoff from the adjacent roads. These features appear to be unconnected to any of the creeks in the area, and are likely to be considered non-jurisdictional.

The third seasonal wetland is located between the highway and Calle Joaquin where the roadside drainage widens to a basin beneath a billboard. This seasonal wetland receives runoff via the roadside drainage to the north, which widens into a basin where the seasonal wetland and freshwater marsh occur. Common species in the seasonal wetlands include poison hemlock, Bermuda grass, birdfoot trefoil, Mediterranean barley, Italian ryegrass, curly dock, bristly ox-tongue, and Harding grass. This feature drains away from Froom Creek and appears to be hydrologically isolated from the creek. This wetland is also likely to be considered non-jurisdictional.

Seasonal Drainage

The study area also includes a seasonal drainage that parallels U.S. 101 and is separated from the southern end of Drainage 2 by a stand of eucalyptus. This drainage flows south and expands into a seasonal wetland in a basin area between U.S. 101 and Calle Joaquin. The lowest point of the basin supports freshwater marsh that appears to be perennial, and then continues to another segment of seasonal drainage at the southernmost part of the study area. The upstream portion of this seasonal drainage is dominated by coyote brush, Himalayan blackberry, poison hemlock, and mugwort. The southernmost end of the

drainage supports primarily arroyo willow, with some nonnatives, such as pepper tree.

A small segment of seasonal drainage lies between Los Osos Valley Road and the southbound on-ramp to U.S. 101. This feature is similar to Drainage 2 and is fed by runoff from the surrounding roads. A culvert connects this seasonal drainage to a patch of creeping wildrye surrounded by ruderal vegetation in an island between Los Osos Valley Road, Calle Joaquin, and a dirt road. The drainage supports an understory of several ruderal trees, including willow, eucalyptus, and pepper tree.

These two seasonal drainages in the study area appear to function only as roadside ditches that are isolated from other drainages and would likely be considered non-jurisdictional.

Nonwetland Habitat

Riparian Forest

Central Coast arroyo willow riparian forest communities in the study area occur along Prefumo Creek and San Luis Obispo Creek west and east of Los Osos Valley Road. One small piece of riparian forest habitat also occurs in the area between U.S. 101 and Calle Joaquin. This community type is multi-layered with trees, small trees and shrubs, and herbaceous layers. Riparian forest vegetation occurs on both banks of the creeks and varies from approximately 75 feet wide on the upstream portion of Prefumo Creek in the study area to approximately 650 feet wide around the confluence of the two creeks. Dominant tree species in the riparian forest community include arroyo willow, California black walnut, black cottonwood, and coast live oak. Common shrubs include coyote brush, California coffeeberry, Himalayan blackberry, and elderberry. Giant reed, an invasive species common in riparian areas, occurs in isolated clumps. Common herbaceous species in riparian forest habitat include poison hemlock, common horsetail, sweetclovers, mugwort, pearly everlasting, periwinkle, garden nasturtium, cocklebur, manroot, and chain speedwell.

Nonnative Annual Grassland

Nonnative annual grassland occurs in several areas south of Los Osos Valley Road within the study area. This community is characterized by a variety of native and nonnative annual forbs and wild oat, soft chess, ripgut brome, squirreltail barley, creeping wildrye, and Italian ryegrass are dominant species. Other representative species include scarlet pimpernel, mustards, Italian thistle, purple and yellow star-thistles, poison hemlock, teasel, redstem filaree, sweet fennel, birdfoot trefoil, bristly ox-tongue, buckhorn plantain, willow dock, sow thistles, salsify, rose clover, woolly mullein, and vetch.

Ruderal

Ruderal vegetation is prevalent in many of the areas adjacent to roadsides in the study area, and is indicative of some degree of disturbance. This community is similar to the nonnative annual grassland, but supports more weedy forbs and some nonnative trees that have the ability to quickly colonize a disturbed area. Common species in ruderal areas include annual grasses, mustards, Italian thistle, pampas grass, English ivy, cheeseweed, rough cat's ear, English plantain, birdfoot trefoil, California plantain, wild radish, milk thistle, sow thistles, and cow clover. Trees observed in ruderal areas include eucalyptus, date palm, weeping willow, and pepper tree.

Agricultural

Agricultural lands surround much of the development in the study area on both sides of the highway and Los Osos Valley Road. Crops include strawberries, wheat, and corn, although most fields were disked or fallow at the time of the botanical surveys. Within fallow fields, representative species include saltweed, mustards, shepherd's purse, mouse-ear chickweed, pineapple weed, giraffe head, broad-leaved pepper-grass, common groundsel, dwarf nettle, and neckweed.

Developed/Landscape

Developed/landscaped areas in the study area are comprised of paved or graded areas, buildings, and landscaping surrounding development. Vegetation consists primarily of horticultural trees and shrubs, with finite areas of herbaceous flowering plants and turf grass.

One developed/landscaped area occurs in an isolated area within the U.S. 101 northbound on-ramp cloverleaf. This piece of land is surrounded by Los Osos Valley Road, the on-ramp, and the highway. This area is planted with highway landscaping and includes western sycamores with a few coast live oaks and an herbaceous understory of Harding grass, Bermuda grass, and curly dock. Nonnative trees, including eucalyptus and pepper tree, occur on the slopes at the road edges. A seasonal wetland also occurs in this area near the culvert under the on-ramp.

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Appendix A

Representative Photographs

Photo 1. Prefumo Creek (Perennial Drainage)

Photo 2. San Luis Obispo Creek (Perennial Drainage)

06150.06 Wet. Delin. (8-06)

Appendix A
Representative Photographs of Potential Waters of the United States in the Study Area

Photo 3. Seasonal Drainage West of Highway 101

Photo 4. Seasonal Wetland in Sycamore Woodland

06150.06 Wet. Delin. (8-06)

Appendix A
Representative Photographs of Potential Waters of the United States in the Study Area

Appendix B

Routine Wetland Determination Data Forms

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Seasonal Wetland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☑ YES	☐ NO	Plot ID:	DP-1

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Dipsacus fullonum [sylvestris]	H	40	NI	*Hirschfeldia incana*	H	15	NL
Conium maculatum	H	30	FACW	*Baccharis pilularis*	S	10	

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 50 Total vegetation cover 80 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☐ YES ☑ NO

Remarks:
Vegetation is borderline at 50%.

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>10	inches
Depth to Saturated Soil:	>10	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☑ YES ☐ NO

Remarks:
Data point is located in a basin. Deep cracking in soils is present.

SOILS

Plot ID: DP-1

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-10	cl		10YR 3/1	none	---	---	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☑ Gleyed or Low-Chroma ($\leq$1) matrix
- ☐ Matrix Chroma $\leq$2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☐ YES ☑ NO

Wetland hydrology present? ☑ YES ☐ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

This area has borderline vegetation, but is in a defined basin with evidence of ponding and hydric soils. This area is a roadside ditch, and could be subject to disturbance of vegetation for maintenance. It has been included on the wetland map for the ACOE to make a determination of jurisdiction.

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Ruderal
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-2

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Conium maculatum	H	80	FACW	*Baccharis pilularis*	S	5	NL

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 60 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☑ NO

Remarks:
Data point is located in on slope between the basin and the road.

SOILS

Plot ID: DP-2

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-3	xgr		---	none	---	---	gravel
	3-12	cl		10YR 3/2	none	---	---	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma ($\leq$1) matrix
- ☐ Matrix Chroma $\leq$2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☐ YES ☑ NO

Remarks:

Soils are potentially fill material.

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☐ YES ☑ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Freshwater Marsh
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-3

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Juncus xiphioides	H	60	OBL	*Rubus discolor*	S	10	FACW
Typha angustifolia	H	20	OBL	*Helenium puberulum*	H	10	FACW
				Epilobium ciliatum	H	<5	FACW

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On: ☐ Soil Temp (record) ☐ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☑ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☑ Other (explain below)

Wetland Hydrology Present? ☑ YES ☐ NO

Remarks:
Data point is located in basin. Deep cracking is present in the drier portions.

SOILS

Plot ID: DP-3

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-3	c		10YR 3/1	none	---	---	
	3-12	cl		10YR 3/1	f,2,f	Fe-x, mat	10YR 4/4	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma ($\leq$1) matrix
- ☑ Matrix Chroma $\leq$2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☑ YES ☐ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☑ YES ☐ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Annual Grassland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-4

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Leymus triticoides	H	40	FAC+	*Phalaris aquatica*	H	10	FAC+
Picris echioides	H	40	FAC				

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 90 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>10	inches
Depth to Saturated Soil:	>10	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☑ NO

Remarks:
Data point is located on a slope above the ditch.

SOILS

Plot ID: DP-4

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-10	gr		2.5Y 3/2	none	---	---	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma ($\leq$1) matrix
- ☐ Matrix Chroma $\leq$2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☐ YES ☑ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☐ YES ☑ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/10/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Sycamore Woodland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☑ YES	☐ NO	Plot ID:	DP-5

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Phalaris aquatica	H	50	FAC+	*Rumex crispus*	H	15	FACW-
Cynodon dactylon	H	30	FAC				
Platanus racemosa	T	40	FACW				

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☑ NO

Remarks:
Data point is located in a basin within a freeway cloverleaf. No evidence of surface water (e.g., sediment deposits) is present.

SOILS

Plot ID: DP-5

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-4	scl		10YR 3/2	none	---	---	rocks
				10YR 6/4				
	4-12	cl		10YR 3/3	none	---	---	
				10YR 6/4				

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☐ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☐ YES ☑ NO

Remarks:

Soil consists of fill material.

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☐ YES ☑ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Seasonal Wetland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☑ YES	☐ NO	Plot ID:	DP-6

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Cynodon dactylon	H	50	FAC	*Hordeum marinum**	H	10	FAC
Lotus corniculatus	H	20	FAC	*Lolium multiflorum*	H	<5	FAC
				Rumex crispus	H	10	FACW-
				Phalaris aquatica	H	<5	FAC+

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:
*ssp. *gussoneanum*

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☑ YES ☐ NO

Remarks:

SOILS

Plot ID: DP-6

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-3	cl		10YR 3/2	f,1,f	Fe-x, mat	10YR 4/4	rocks
	3-12	cl		10YR 4/2	f,2,d	Fe-x, mat	10YR 5/8	
					c,2,f	Fe-x, mat	10YR 6/4	
					m,3,d	Fe-x, mat	10YR 3/2	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☑ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☑ YES ☐ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☑ YES ☐ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
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sil - silt loam
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scl - sandy clay loam
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sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

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vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Sycamore Woodland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-7

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Phalaris aquatica	H	50	FAC+	*Hordeum marinum**	H	10	FAC
Platanus racemosa	T	30	FACW	*Plantago lanceolata*	H	>5	FAC-
				Cynodon dactylon	H	>5	FAC
				Picris echioides	H	<5	FAC
				Rumex crispus	H	<5	FACW-

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:
*ssp. *gussoneanum*

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On: ☐ Soil Temp (record) ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☐ NO

Remarks:
Data point is located upslope of DP-6. No sediment deposits are present.

SOILS

Plot ID: DP-7

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-12	cl		10YR 4/3	c,3,d	Fe-x, mat	10YR 3/2	few roots present

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☐ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☐ YES ☑ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☐ YES ☑ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Seasonal Wetland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☑ YES	☐ NO	Plot ID:	DP-8

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Phalaris aquatica	H	40	FAC+	*Rumex crispus*	H	10	FACW-
Picris echioides	H	20	FAC	*Lolium multiflorum*	H	10	FAC
				Cynodon dactylon	H	10	FAC

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 60 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☑ YES ☐ NO

Remarks:

SOILS

Plot ID: DP-8

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-3			10YR 2/2	none	---	---	rocks & gravel
	3-12			10YR 2/2	f,2,f	Fe-x, mat	10YR 2/1	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☑ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☑ YES ☐ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☑ YES ☐ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Seasonal Wetland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☑ YES	☐ NO	Plot ID:	DP-9

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Phalaris aquatica	H	100	FAC+				

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 100 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☑ YES ☐ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☑ YES ☐ NO

Remarks:

SOILS

Plot ID: DP-9

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-3			10YR 2/2	none	---	---	rocks & gravel
	3-12			10YR 2/2	f,2,f	Fe-x, mat	10YR 2/1	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☑ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☑ YES ☐ NO

Wetland hydrology present? ☑ YES ☐ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☑ YES ☐ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Annual Grassland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-10

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Erodium cicutarium	H	40	NL	*Avena fatua*	H	15	NL
Phalaris aquatica	H	40	FAC+				

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 50 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☐ YES ☑ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☑ NO

Remarks:

Data point is located upslope of DP-9 at the edge of a *Phalaris* patch.

SOILS

Plot ID: DP-10

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-2	cl		10YR 3/2	c,2,d	Fe-x, mat	10YR 6/4	gravel
	2-12	cl		10YR 4/4	f,3,d	Fe-x, mat	10YR 6/4	
					c,1,d	Fe-x, mat	10YR 5/6	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma (≤1) matrix
- ☑ Matrix Chroma ≤2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☐ YES ☑ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
c - clay

Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Jones & Stokes

DATA FORM
ROUTINE WETLAND DETERMINATION

Project/Site:	Los Osos Valley Road Interchange	State:	CA
Applicant/Owner:	Dokken Engineering	County:	San Luis Obispo
Investigator(s):	Webber, Alcala	S/T/R	
Date:	07/19/06		

Do normal circumstances exist on the site?	☑ YES	☐ NO	Community ID:	Annual Grassland
Is the site significantly disturbed (atypical situation)?	☐ YES	☑ NO	Transect ID:	
Is the area a potential problem area? (If needed, explain below)	☐ YES	☑ NO	Plot ID:	DP-11

VEGETATION

Dominant Plant Species	Strata	% Rel. Cover	Indicator	Associate Plant Species	Strata	% Rel. Cover	Indicator
Pennisetum clandestinum	H	100	FACU+				

Percent of dominants that are OBL, FACW, or FAC (excluding FAC-): 0 Total vegetation cover 100 %

- ☐ Morphological Adaptations
- ☐ Physiological/Reproductive Adaptations
- ☐ Visual Observation of Plant Species Growing in Areas of Prolonged Inundation/Saturation
- ☐ Personal Knowledge of Regional Plant Communities
- ☐ Technical Literature
- ☐ Other (explain below)

Hydrophytic Vegetation Present? ☐ YES ☑ NO

Remarks:

HYDROLOGY

Is it the growing season? ☑ YES ☐ NO

Based On:
- ☐ Soil Temp (record)
- ☑ Other (explain) date of survey

Typical length: 308 Days 5% = 16 days

Recorded Data (describe below):
- ☐ Stream, Lake, or Tide Gauge
- ☑ Aerial Photographs
- ☐ Other
- ☐ None Available

Field Observations:

Depth of Surface Water:	none	inches
Depth to Standing Water in Pit:	>12	inches
Depth to Saturated Soil:	>12	inches

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ☑ Oxidized Rhizospheres in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (explain below)

Wetland Hydrology Present? ☐ YES ☑ NO

Remarks:
Data point is located on a convex slope area within a disked field. A few oxidized rhizospheres are present.

SOILS

Plot ID: DP-11

Map Unit Name (series and phase): _____ Drainage Class: _____

Taxonomy (subgroup): _____ Field observations confirm mapped type? ☐ YES ☐ NO

Is data point located within a hydric inclusion? ☐ YES ☐ NO

Profile Description

Horizon	Depth (inches)	Texture	Structure	Matrix Color (moist)	Redoximorphic Features: Abundance, Size, Contrast	Redoximorphic Features: Type, location	Redoximorphic Features: Color (moist)	Other
	0-12	cl		10YR 3/2	f,1,f	Fe-x, por	7.5YR 5/8	

Hydric Soil Indicators (check all that apply):

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions (α,α'- dipyridyl test)
- ☐ Gleyed or Low-Chroma ($\leq$1) matrix
- ☑ Matrix Chroma $\leq$2 with Redoximorphic Concentrations and/or Depletions
- ☐ Mn or Fe Concretions or Nodules
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain below)

Hydric Soils Present? ☑ YES ☐ NO

Remarks:

WETLAND DETERMINATION :

Hydrophytic vegetation present? ☐ YES ☑ NO

Wetland hydrology present? ☐ YES ☑ NO

Hydric soils present? ☑ YES ☐ NO

Is the sampling point within a wetland? ☐ YES ☑ NO

Remarks:

Texture and Rock Fragment Content

Texture

cos - coarse sand
s - sand
fs - fine sand
vfs - very fine sand
lcos - loamy coarse sand
ls - loamy sand
lfs - loamy fine sand
lvfs - loamy very fine sand
cosl - coarse sandy loam
sl - sandy loam
fsl - fine sandy loam
vfsl - very fine sandy loam
l - loam
sil - silt loam
si - silt
scl - sandy clay loam
cl - clay loam
sicl - silty clay loam
sc - sandy clay
sic - silty clay
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Rock Fragments

gr - gravelly
vgr - very gravelly
xgr - extremely gravelly
cb - cobbly
vcb - very cobbly
xcb - extremely cobbly
st - stony
vst - very stony
xst - extremely stony

Redoximorphic Feature Morphology

Abundance

f - few
c - common
m - many

Size

1 - fine (<2mm)
2 - medium 2–5mm)
3 - coarse (5–20mm)
4 - very coarse (20–76mm)
5 - extremely coarse (>76mm)

Contrast

f - faint
d - distinct
p - prominent

Type

Fe-x - iron concentration (soft mass)
Fe-nc - iron nodule or concretion
Mn-x - manganese concentration (soft mass)
Mn-nc - manganese nodule or concretion
d - depletion

Location

mat - soil matrix
ped - ped surface
por - soil pores
otr - other

Exhibit A

Wetland Delineation Map

Exhibit A
Delineation of Waters of the United States, Including Wetlands

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Wetland Type	Area (acres)
Jurisdictional Waters of the United States	
Wetlands	
Freshwater Marsh	1.07
*marsh #1**	*1.07*
Seasonal Wetland	0.25
*Drainage #1**	*0.02*
*Drainage #2**	*0.23*
Other Waters	
Seasonal Drainage	0.19
*Drainage #2**	*0.14*
SD-04 (*Froom Creek*)	0.05
Perennial Drainage	1.56
PD-01 (*San Luis Obispo Creek*)	0.84
PD-02 (*Prefumo Creek*)	0.72
Total Jurisdictional	**3.07**
Non-jurisdictional Wetlands and Drainages	
Freshwater Marsh	0.24
FWM-02	0.24
Seasonal Drainage	0.10
SD-03	0.09
SD-05	0.01
Seasonal Wetland	0.60
SW-01	0.41
SW-02	0.16
SW-03	0.03
Total Non-jurisdictional	**0.94**

* Features labeled in *red* were previously delineated as part of the Calle Joaquin Realignment Project by Morro Group, Inc., 2004.

Data Point
Culvert
Delineation Area Boundary

Aerial Photo Source: City of San Luis Obispo, 2005

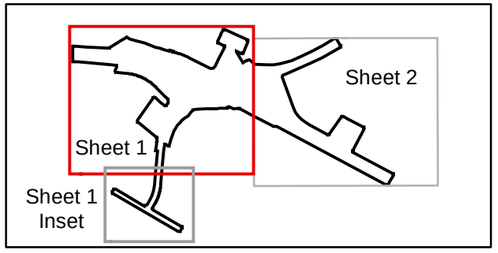

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Exhibit A
Delineation of Waters of the United States, Including Wetlands

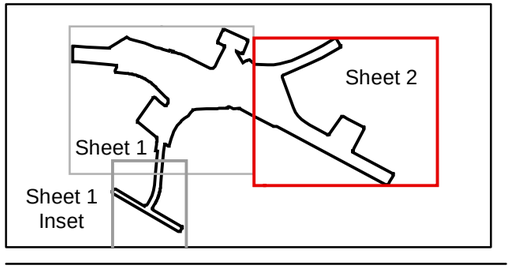
Los Osos Valley Road Interchange Project
San Luis Obispo, California

Wetland Type	Area (acres)
Jurisdictional Waters of the United States	
Wetlands	
Freshwater Marsh	1.07
*marsh #1**	*1.07*
Seasonal Wetland	0.25
*Drainage #1**	*0.02*
*Drainage #2**	*0.23*
Other Waters	
Seasonal Drainage	0.19
*Drainage #2**	*0.14*
SD-04 (*Froom Creek*)	0.05
Perennial Drainage	1.56
PD-01 (*San Luis Obispo Creek*)	0.84
PD-02 (*Prefumo Creek*)	0.72
Total Jurisdictional	**3.07**
Non-jurisdictional Wetlands and Drainages	
Freshwater Marsh	0.24
FWM-02	0.24
Seasonal Drainage	0.10
SD-03	0.09
SD-05	0.01
Seasonal Wetland	0.60
SW-01	0.41
SW-02	0.16
SW-03	0.03
Total Non-jurisdictional	**0.94**

* Features labeled in *red* were previously delineated as part of the Calle Joaquin Realignment Project by Morro Group, Inc., 2004.

Data Point
Culvert
Delineation Area Boundary

Aerial Photo Source: City of San Luis Obispo, 2005



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Appendix B South-Central California Coast Steelhead Biological Assessment

Los Osos Valley Road/
U.S. 101 Interchange Improvements Project

Biological Assessment for
South-Central California Coast Steelhead

Los Osos Valley Road/U.S. 101 Interchange Improvements Project

City of San Luis Obispo, San Luis Obispo County, California

05-SLO-101-PM 25.9-26.3

E.A.05-OH7300

March 2008

Caltrans

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Biological Assessment for South-Central California Coast Steelhead

Los Osos Valley Road/U.S. 101 Interchange Improvements Project
City of San Luis Obispo, San Luis Obispo County, California
Caltrans District 5
05-SLO-101-PM 25.9-26.3
E.A.05-OH7300

May 2008

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration,
STATE OF CALIFORNIA
Department of Transportation

Prepared For: _____ Date: 6-19-08.
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List of Abbreviated Terms

BA	biological assessment
BMP	Best Management Practices
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
City	City of San Luis Obispo
CNDDB	California Natural Diversity Database
DPS	distinct population segment
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FR	Federal Register
LOVR	Los Osos Valley Road
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NPDES	National Pollutant Discharge Elimination System
OHWM	ordinary high-water mark
PDT	Project Development Team
RCB	reinforced concrete box
RSP	rock slope protection
SHELL	State Highway Extra Legal Load
SRA	shaded riverine aquatic
study area	biological study area
SWPPP	storm water pollution prevention plan
TCR	Transportation Concept Report
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WPCP	water pollution control plan
WRF	Water Reclamation Facility

Summary of Findings, Conclusions, and Determinations

S.1 Project Overview

The proposed project is located in the City of San Luis Obispo, San Luis Obispo County on U.S. 101 at the Los Osos Valley Road (LOVR) Interchange (Figure 1-1). Within the limits of the proposed project, U.S. 101 is a four-lane freeway with 3.6-meter (12-foot) lanes, 2.4-meter (8-foot) right shoulders, and a median width of 12.2 meters (40 feet). The original two-lane roadway was built in 1933 and was replaced with a four-lane facility in 1954. The functional classification of this segment of U.S. 101 is a Principal Arterial and is included in the National Highway System. U.S. 101 is also a State Highway Extra Legal Load (SHELL) route and an oversize truck route. Commuter traffic is the primary use through this portion of U.S. 101, but a large percentage of travel through the study area is interregional. The Transportation Concept Report (TCR), dated 2001, recommends that U.S. 101 be expanded to a six-lane freeway through this segment. However, widening of U.S. 101 is not part of this project.

The purpose of the proposed project is to improve traffic operations and safety on LOVR and the LOVR/U.S. 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to be designed such that it will not preclude the planned ultimate widening of U.S. 101 or future interchange improvements.

S.2 Federally Listed Fish Species and Critical Habitat

South-central California coast steelhead (*Oncorhynchus mykiss*) may be affected by the project. Critical habitat for steelhead is designated within the project area. It is unknown how many juvenile and adult steelhead would be affected by the project. Recent studies in the project area indicate that juvenile steelhead use pools in San Luis Obispo Creek for rearing. It is unknown whether San Luis Obispo and Prefumo Creeks within the study area are used by adult steelhead for spawning and how many adult steelhead migrate upstream and use the upper reaches of these creeks.

Critical habitat is defined in the project area and includes San Luis Obispo and Prefumo Creeks. Implementation of the locally preferred alternative would result in a permanent loss of approximately 0.16 hectares (0.40 acres) of riparian forest and temporary disturbance of approximately 0.34 hectares (0.84 acres) of riparian forest within the study area during construction of a new northbound on-ramp and bridge at San Luis Obispo and Prefumo Creeks, widening of the existing LOVR overcrossing at San Luis Obispo and Prefumo Creeks. Most of the riparian vegetation removal will occur away from the creek banks. The total linear feet of shaded riverine aquatic (SRA) habitat that will be removed is 274 linear meters (900 linear feet). San Luis Obispo Creek will have 92 linear meters (300 linear feet) of shaded riparian vegetation removed, and Prefumo Creek will have 184 linear meters (600 linear feet), of which 18 linear

meters (60 linear feet) will be permanently removed in San Luis Obispo Creek and 60 linear meters (200 linear feet) will be permanently removed in Prefumo Creek.

A permanent loss and temporary disturbance will occur in the channels of San Luis Obispo and Prefumo Creeks. A permanent loss of approximately 0.03 hectare (0.07 acre) of perennial drainage and temporary disturbance of approximately 0.08 hectare (0.19 acre) of perennial drainage, construction of a new northbound on-ramp and bridge at San Luis Obispo and Prefumo Creeks, and the widening of the existing LOVR overcrossing at San Luis Obispo Creek will occur for the locally preferred alternative.

Based on the a review of the current status of the south-central California coast steelhead Distinct Population Segments (DPS) in the San Luis Obispo Creek watershed, and factoring in the effects of constructing the Los Osos Valley Road/U.S.-101 interchange improvements project, and cumulative effects in the action area, the analysis in this biological assessment supports the conclusion that the proposed action will result in a "may affect, likely to adversely affect" determination for south-central California coast steelhead.

Essential features of critical habitat for south-central California steelhead include water quantity and quality, cover/shelter, shade, substrate, food, riparian vegetation, space, and safe passage conditions. The LOVR/U.S.-101 interchange improvements project would result in short- and long-term habitat changes, but these changes would be small relative to the amount of habitat present within the watershed. The analysis contained with this biological assessment supports the conclusion that the LOVR/U.S.-101 interchange improvements project is likely to adversely affect critical habitat, but the proposed action would not appreciably diminish the value of the primary constituent elements that are essential to the conservation of the species.

S.3 Avoidance and Minimization Measures

As part of the proposed project, the construction contractor will implement the following avoidance and minimization measures, which are identified and described in Chapter 5. These measures have been identified based on natural resources identified as present or having the potential to occur in the study area and the potential impacts that could occur as a result of the proposed project:

- Measure 1: Limit In-Channel Construction Activities to the Low-Precipitation Period
- Measure 2: Implement Water Quality Measures
- Measure 3: Implement Stream Diversion Restrictions
- Measure 4: Avoid Stranding Impacts to Fish in Dewatered Areas
- Measure 5: Avoid and Minimize Impacts to Spawning Habitat
- Measure 6: Minimize Noise Impacts from Pile Driving
- Measure 7: Compensate for Temporarily and Permanently Impacted Riparian Forest Vegetation

- Measure 8: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization
- Measure 9: Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks

Chapter 1 Introduction

The purpose of this biological assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the Los Osos Valley Road (LOVR)/U.S. 101 interchange project may affect threatened, endangered, or proposed species. The BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the federal Endangered Species Act (ESA) (16 United States Code [USC] 1536[c]) and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

1.1 Project History

The proposed project is located in the City of San Luis Obispo (City), San Luis Obispo County on U.S. 101 at the LOVR Interchange (Figure 1-1). Within the limits of the proposed project, U.S. 101 is a four-lane freeway with 3.6-meter (12-foot) lanes, 2.4-meter (8-foot) right shoulders, and a median width of 12.2 meters (40 feet). The original two-lane roadway was built in 1933 and was replaced with a four-lane facility in 1954. The functional classification of this segment of U.S. 101 is a Principal Arterial and is included in the National Highway System. U.S. 101 is also a State Highway Extra Legal Load (SHELL) route and an oversize truck route. Commuter traffic is the primary use through this portion of U.S. 101, but a large percentage of travel through the study area is interregional. The Transportation Concept Report (TCR), dated 2001, recommends that U.S. 101 be expanded to a six-lane freeway through this segment. However, widening of U.S. 101 is not part of this project.

The existing U.S. 101/LOVR interchange is configured as a diamond interchange except that a loop ramp in the southeast quadrant of the interchange provides access from LOVR to northbound U.S. 101. The LOVR overcrossing (No. 49-0185) was built in 1962 to carry two lanes of traffic. The bridge was widened in 1987 to carry four lanes of traffic. The existing bridge is a four-span structure of approximately 91.6 meters (300.5 feet) in length and 16.8 meters (55 feet) in width. Roadway embankments up to 6 meters (20 feet) in height were constructed for the overcrossing. Southeast of the interchange, within the project limit, LOVR passes over San Luis Obispo Creek. The on-ramp to southbound U.S. 101 is accessed from Calle Joaquin-South and not directly from LOVR. The southbound U.S. 101 off-ramp intersects LOVR at the LOVR/Calle Joaquin-South intersection. Calle Joaquin-North intersects LOVR approximately 91 meters (300 feet) to the west of the southbound U.S. 101 off-ramp/Calle Joaquin-South intersection.

1.2 Purpose and Need

The purpose of the proposed project is to improve traffic operations and safety on LOVR and the LOVR/U.S. 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to

be designed such that it will not preclude the planned ultimate widening of U.S. 101 or future interchange improvements.

1.3 Project Description

The project limits extend along LOVR between Auto Park Way to the west and South Higuera Street to the east and along U.S. 101 for approximately 762 meters (2,500 feet) south and 1,500 meters (4,300 feet) north of the LOVR overcrossing, covering a distance of 0.84 km (0.52 miles). The proposed project will provide a wider Los Osos Valley Road Overcrossing and an adjacent bridge crossing San Luis Obispo Creek, and the possible relocation and reconfiguration of the freeway ramps depending on the alternative chosen. This project is intended to accommodate current and future travel demands. Calle Joaquin Road south of LOVR is being realigned such that the existing "T" intersection of LOVR and Calle Joaquin Road north of LOVR will be converted to a four-legged intersection. The Calle Joaquin Road realignment is currently being developed by the Costco Wholesale Corporation as a condition of approval and mitigation measure for traffic impacts. The realignment is scheduled for completion prior to initiation of interchange improvements.

Under the proposed project, San Luis Obispo Creek Arch Culvert will be modified. The existing three-barrel structural steel plate arch culvert is a large and modern (1986) structure, carrying LOVR over San Luis Obispo Creek. This project would widen and raise the roadway. These roadway revisions require lengthening the culvert with a new structural steel arch (matching the existing), as well as increasing the loading on the existing culvert that is to remain. To determine the feasibility of this increased loading, a structural analysis was conducted. The analysis showed that the existing culvert can easily carry the additional loading placed on it. Therefore, lengthening the culvert is a viable option.

1.4 Project Schedule

The project is planned for construction in 2010.

1.5 Alternatives Considered

Two viable build alternatives have been identified by the Project Development Team that meet the purpose and need for this project. The locally preferred alternative, Alternative 3, is described below.

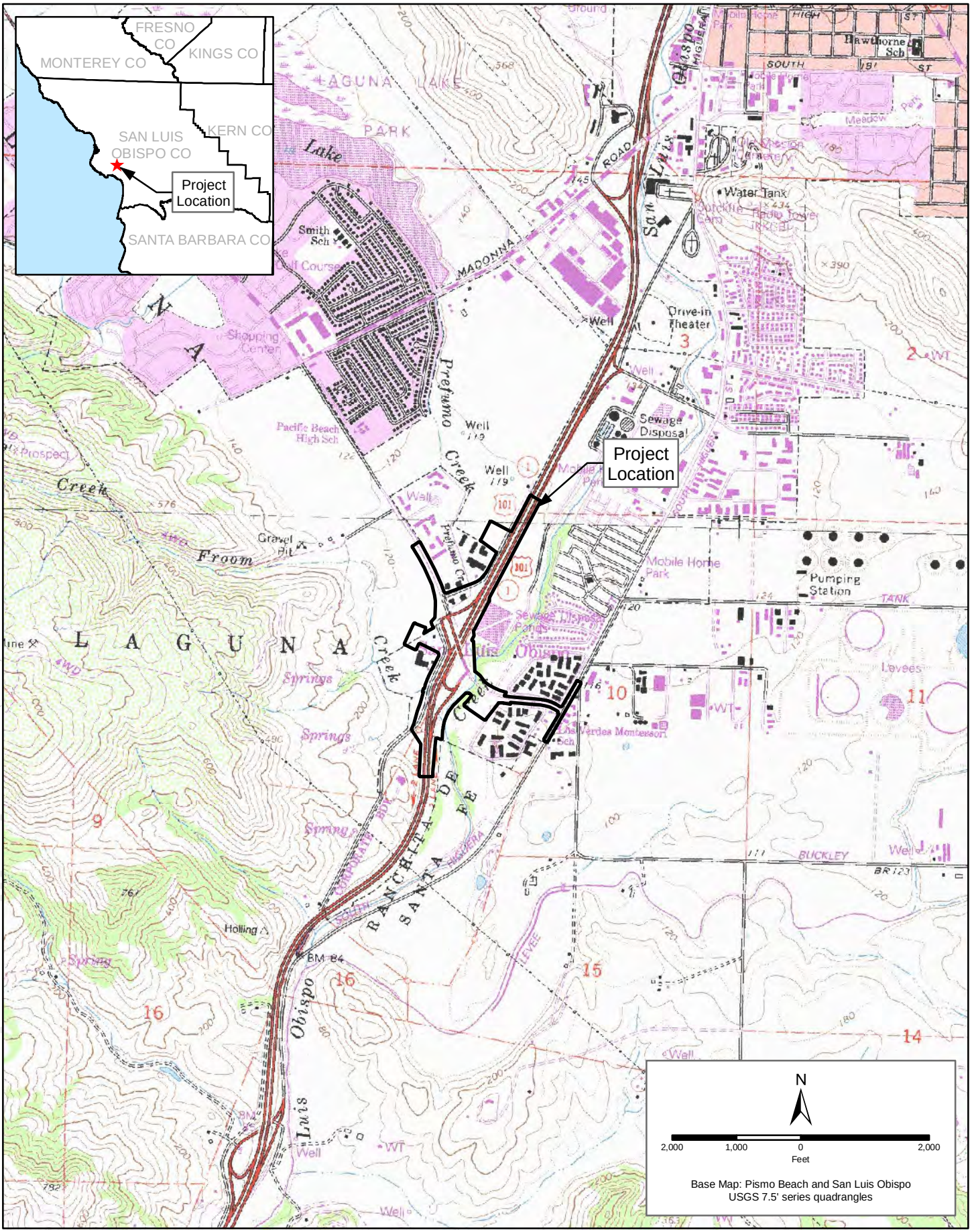


Figure 1-1
Project Location

1.5.1 Alternative 3

Alternative 3 is the minimum build alternative for this project (Figure 1-2). This alternative proposes to widen Los Osos Valley Road between the recently constructed Calle Joaquin intersection with Los Osos Valley Road west of US 101 and the Los Verdes community east of US 101 to 4 lanes, including the existing Los Osos Valley Road Overcrossing structure, and San Luis Obispo Creek culvert crossing. The widening will be accomplished by constructing a separate structure to carry the two eastbound lanes over US 101. Los Osos Valley Road will be a split profile over US 101 to accommodate the westbound lanes on the existing overcrossing. The project will lengthen the San Luis Obispo Creek culvert crossing on the south side and construct a cantilevered sidewalk on the north side. These widening efforts will accommodate four 12 foot through-lanes, bike lanes, sidewalks (on both sides), and a median 5 to 16 feet in width, which will be used for left turn pockets where needed. The northbound US 101 off-ramp will be widened from the intersection with Los Osos Valley Road to 500 feet south. The southbound on-ramp will be reconstructed near the current location opposite the southbound off-ramp.

The actual work to be performed under this alternative includes:

- Widen Los Osos Valley Road from 2 to 4 lanes from South Higuera St. to 600 feet north of Calle Joaquin to meet existing 4 lane section west of Calle Joaquin.
- Extend existing San Luis Obispo Creek Culvert Crossing to accommodate widened Los Osos Valley Road.
- Construct retaining walls to avoid San Luis Obispo Creek impacts.
- Construct a separate US 101 Overcrossing to carry the 2 eastbound lanes with a split profile.
- Raise the intersection of Los Osos Valley Road/US 101 southbound ramps.
- Construct retaining walls to avoid Prefumo Creek and business impacts at LOVR/US-101 southbound ramps
- Construct sidewalks and Class II bike lanes along both sides of Los Osos Valley Road.
- Construct new street lighting along Los Osos Valley Road.
- Modify existing signals at Los Osos Valley Road/US 101 ramp intersections.
- Construct additional box culvert capacity under US 101 for Prefumo Creek.
- Raise headwalls on Prefumo Creek box culvert under southbound off-ramp to accommodate ramp raising and widening
- Increase the hydraulic capacity of San Luis Obispo Creek by removal of deposited sediment from the outer two bays of the of the San Luis Obispo Creek bridge to a level 3 feet above the bottom of the active channel to prevent spreading flow. No modification will be made to the active channel.
- Widen/reconstruct US 101 northbound off-ramp and construct retaining wall to avoid creek impacts.
- Widen US 101 southbound off-ramp and construct retaining walls.

- Modify storm drain system along Los Osos Valley Road to accommodate widening and profile revisions.
- Modify landscaping and sidewalks along Los Osos Valley Road at Los Verdes.
- Modify striping, medians, and lane widths along Los Osos Valley Road at Los Verdes.
- Restripe on South Higuera Street to optimize the capacity of the South Higuera Street/Los Osos Valley Road intersection given the widening of Los Osos Valley Road.
- Construct retention basin within the northbound loop on ramp.
- Construct native landscaping within the intersection.
- Construct standard acceleration lane from southbound on-ramp.

No modifications will be made to drainage structures at the on/off ramps at Froom Creek.

1.5.1.1 Mandatory Standards

Non-standard vertical clearance (HDM 309.2(1)(a) – The existing Los Osos Valley Road Overcrossing vertical clearance is 14 feet-x inches. Current standards call for 16 feet-6 inches.

Non-standard intersection spacing (HDM 504.3(3)) – Intersection spacing between the Southbound on/off ramp intersection and the Calle Joaquin intersection on Los Osos Valley Road is 310 feet. Current standards call for 400 feet. *(this design exception was approved in 2006 as part of the Calle Joaquin relocation project)*

Non-standard deceleration length (HDM 504.2) – The existing southbound off-ramp to Los Osos Valley Road includes a radius of 400 feet and provides a deceleration length of 302 feet. Current standards call for 470 feet.

Non-standard design speed (HDM 101.1) – The LOVR profile at the southbound ramp intersection provides a 30 mph design speed. Current standards call for a 35 mph design speed.

Non-standard side slopes (HDM 304.1) – Side slope grading along the northbound off-ramp and southbound off-ramp is proposed to be 2:1. Current standards call for 4:1 slopes.

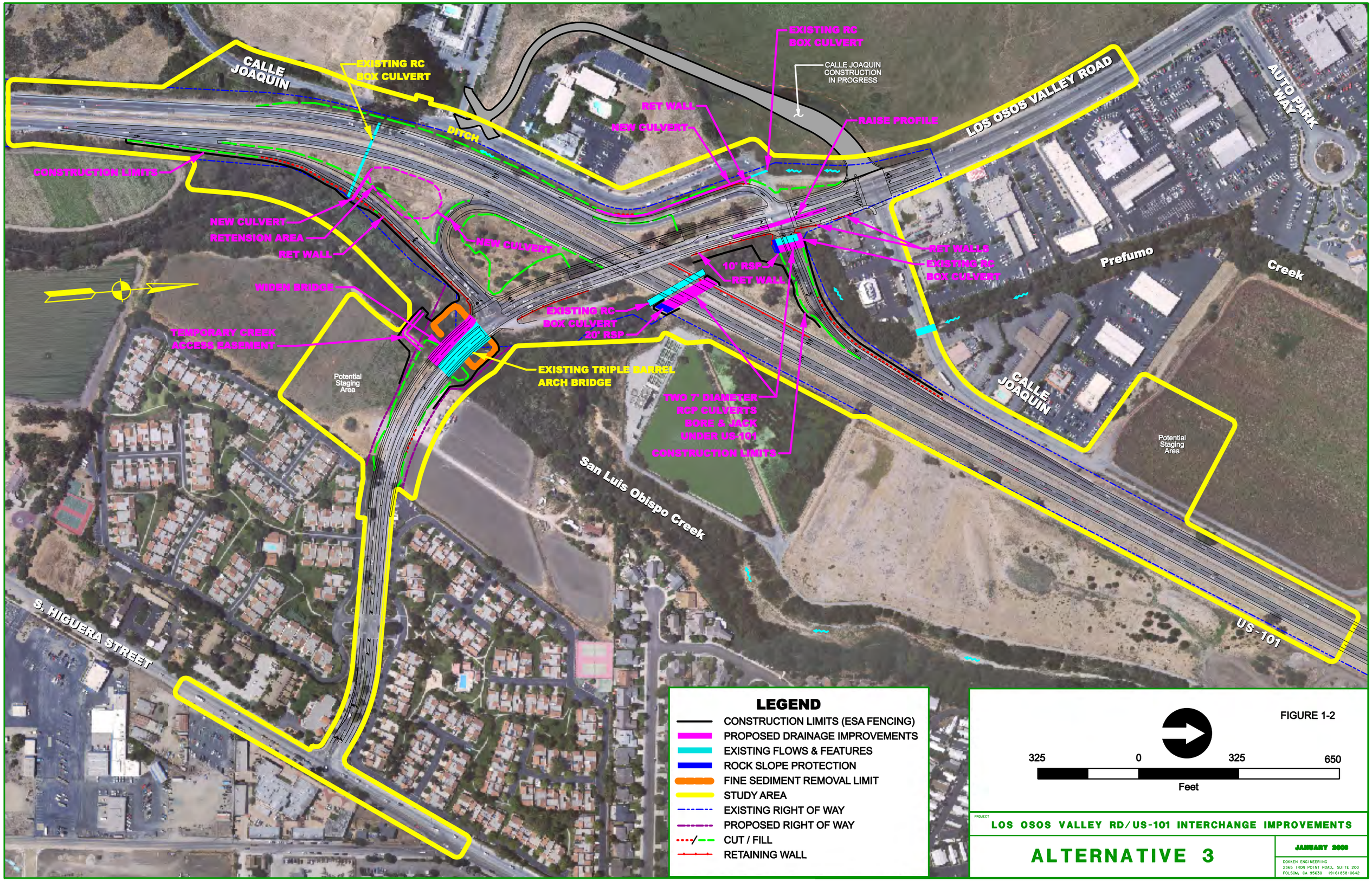
1.5.1.2 Advisory Standards

No exceptions are required to the advisory design standards.

1.5.1.3 Design Minimization Measures

Alignment adjustments

- Northbound off-ramp moved west toward US 101 away from San Luis Obispo Creek ensuring trees will not be removed in this area and work can be conducted from existing roadway.
- Moving this off-ramp also avoids impacts to the Froom Creek outfall since it will not need to be extended to accommodate the road. The Froom Creek outfall will not be modified.


CALLE JOAQUIN
EXISTING RC BOX CULVERT
DITCH
CONSTRUCTION LIMITS
NEW CULVERT
RETENSION AREA
RET WALL
NEW CULVERT
WIDEN BRIDGE
TEMPORARY CREEK ACCESS EASEMENT
Potential Staging Area
EXISTING TRIPLE BARREL ARCH BRIDGE
EXISTING RC BOX CULVERT
20' RSP
10' RSP
RET WALL
TWO 7' DIAMETER RCP CULVERTS BORE & JACK UNDER US-101
CONSTRUCTION LIMITS
San Luis Obispo Creek
S. HIGUERA STREET
EXISTING RC BOX CULVERT
CALLE JOAQUIN CONSTRUCTION IN PROGRESS
RET WALL
NEW CULVERT
RAISE PROFILE
LOS OSOS VALLEY ROAD
AUTO PARK WAY
RET WALLS
EXISTING RC BOX CULVERT
Prefumo
Creek
CALLE JOAQUIN
Potential Staging Area
US-101
LEGEND
CONSTRUCTION LIMITS (ESA FENCING)
PROPOSED DRAINAGE IMPROVEMENTS
EXISTING FLOWS & FEATURES
ROCK SLOPE PROTECTION
FINE SEDIMENT REMOVAL LIMIT
STUDY AREA
EXISTING RIGHT OF WAY
PROPOSED RIGHT OF WAY
CUT / FILL
RETAINING WALL
FIGURE 1-2
325 0 325 650
Feet
PROJECT
LOS OSOS VALLEY RD/US-101 INTERCHANGE IMPROVEMENTS
ALTERNATIVE 3
JANUARY 2008
DOKKEN ENGINEERING
2365 IRON POINT ROAD, SUITE 200
FOLSOM, CA 95630 (916)858-0642

Retaining walls and embankment configurations

- A retaining wall on northbound off-ramp will limit impacts to San Luis Obispo Creek.
- A retaining wall on southbound off-ramp will limit impacts to Prefumo Creek.
- Steeper 2:1 side slopes are proposed along the northbound off-ramp and southbound off-ramp. Current standards call for 4:1 slopes but the steeper 2:1 gradients further restrict the horizontal extent of the road embankment that would encroach into San Luis Obispo Creek and Prefumo Creek.
- A retaining wall will be built along the southbound on ramp restricting fills into a portion of Drainage Ditch #2.
- A retaining wall will be built along westbound LOVR between US 101 and the south southbound off-ramp and will also restrict impacts to Prefumo Creek.

In-stream modifications

- If disturbance to the gravel cannot be avoided in San Luis Obispo Creek, the gravel will be removed temporarily and replaced to the extent practicable with gravel removed from the site. Before returning gravels to the channel following construction, gravels will be washed to remove fines before they are placed back into the creek channel. If it becomes necessary to augment disturbed gravels with gravel from outside sources, only washed river gravel (to remove fines) appropriately sized for adult steelhead will be used. To correct unnatural drainage patterns, approximately 60.96 meters (200 feet) downstream of the LOVR bridge, the project will include removal of fine sediments and replacement of them with appropriately-sized spawning gravels.
- Where rock slope protection (RSP) is needed, native riparian vegetation and/or large woody material will be incorporated in the RSP to the extent practicable.
- In order to reduce gaps in the post-construction canopy (i.e., shade), the design restricts extensions of streambank RSP or other bank protection (e.g., sheet piles or bank and channel armoring) to the minimum necessary to protect essential infrastructure.
- Permanent fish passage will be maintained or improved at each structure that requires modification.

  A. Along Prefumo Creek fish passage will be maintained by extending the structure on the RSP on the outfall.

  B. Along San Luis Obispo Creek fish passage will not be impeded by the RSP on the banks.

  C. No work proposed in Froom Creek.

Replanting and final grading

- The two seasonal wetlands, located in the artificially created basins between U.S. 101 and existing northbound on- and off-ramps, will be restored onsite as a retention basin after the new ramps are constructed. These features appear to be unconnected to any of the creeks in

the area, and are likely to be considered non-jurisdictional by the Corps. To ensure sufficient ponding in support of wetland vegetation, the basin will be excavated to pre-project conditions and planted with a native seed mix.

- All disturbed areas will be seeded with native mixes and mulched with certified weed-free mulch (rice straw may be used in upland areas). Native, non-invasive species will be used in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.

1.6 Additional Project Features to Avoid and Minimize Impacts

As part of the proposed action, the City will implement preventive actions to avoid and minimize potential adverse construction effects on aquatic and riparian resources by replanting riparian vegetation disturbed or removed during construction. A storm water pollution prevention plan (SWPPP) will be implemented as part of the National Pollutant Discharge Elimination System (NPDES) and a General Construction Activity Storm Water Permit to minimize the potential for sediment input to the aquatic system, where it could adversely affect steelhead spawning and rearing habitat. A toxic materials control and spill response plan will be implemented to regulate the use of hazardous materials, such as the petroleum-based products used as fuel and lubricants for equipment and other potentially toxic materials associated with project construction.

Any activity that will temporarily divert flow from any segment of the river will require implementation of a variety of constraints. Pile driving activities will also require sound minimization measures. Although construction will occur during the low-flow period (June 1 through October 31), in-channel construction activities could result in some harassment or delay of migrating juvenile steelhead from noise, artificial light, and other disturbances. Injury or mortality could also occur due to pile driving and fish salvage and relocation efforts. These disturbances are expected to take place over two dry seasons, each four months in duration. Some juvenile steelhead are expected to be in the project area during in-channel construction and will be affected by project activities. Juvenile survival and growth could be affected.

The City will implement the following avoidance and minimization measures for steelhead occurring in San Luis Obispo and Prefumo Creeks.

Measure 1: Limit In-Channel Construction Activities to the Low-Precipitation Period
In-channel construction, including streambank and channel bed construction below the ordinary high-water mark (OHWM), will be limited to the summer low-precipitation period (June 1 to October 31) to minimize adverse effects on adult fish spawning and smolt migration. Project construction in the channel will also be subject to the following constraints:

- Construction requiring stream dewatering, stream crossings, or work in the channel bed will not start before June 1. Upstream and downstream passage for fish, including juvenile steelhead, will be provided through or around construction sites at all times. Cofferdams will be installed in all affected creeks to divert stream flow around each footing excavation. The construction period limits will also apply to a water diversion system (i.e., an open, lined

ditch) that will be needed on San Luis Obispo Creek. Limiting in-channel construction to the June 1 to October 31 period will achieve two goals:

- Construction will not be concurrent with the primary migration and spawning periods of steelhead.
- The length of the construction period will be maximized, thereby reducing the potential for in-channel construction (i.e., below the OHWM) to have to be extended beyond October 31 of that year, or into the following construction season.

Measure 2: Implement Water Quality Measures

The City will avoid or minimize increased sediment input to the project area channel. As part of the NPDES General Construction Activity Storm Water Permit, a SWPPP will be implemented that includes the following:

- conducting all construction work according to site-specific construction plans that minimize the potential for sediment input to the aquatic system;
- identifying all areas requiring clearing, grading, revegetation, and recontouring, and minimizing the areas to be cleared, graded, and recontoured;
- grading spoil sites to minimize surface erosion;
- avoiding riparian and wetland vegetation wherever possible and identifying and fencing specific trees to protect existing riparian habitat;
- covering bare areas with mulch and revegetating all cleared areas;
- avoiding equipment operation in flowing water during in-channel activities by constructing coffer dams and diverting all streamflows through or around construction sites; and
- constructing sediment catch basins across stream channels immediately below the project site when performing in-channel construction to prevent silt- and sediment-laden water from entering the main streamflow (accumulated sediments will be periodically removed from the catch basin).

Increased pollutant input to the project area channel will also be minimized and avoided by:

- preventing raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses;
- establishing a spill prevention and countermeasure plan before project construction that includes strict onsite handling rules to keep construction and maintenance materials out of drainages and waterways;
- cleaning up all spills immediately according to the spill prevention and countermeasure plan and notifying California Department of Fish and Game (CDFG) and NOAA Fisheries immediately of any spills and cleanup activities;
- providing areas located outside the OHWM for staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants;

- removing vehicles from the normal high-water area of the waterway before refueling and lubricating; and
- avoiding operation of equipment in flowing water.

Implementation of measures to avoid or minimize the effects of increased sediment input will also avoid and minimize increased input of pollutants associated with sediments (e.g., mercury) and the potential for subsequent effects on steelhead.

Measure 3: Implement Stream Diversion Restrictions
Flow will be diverted in San Luis Obispo Creek during bridge widening and other in-channel work. Flow will be diverted from June 1 to October 31. As stated in the project description, flow will be diverted on San Luis Obispo Creek beginning at a point upstream of the LOVR bridge. An open, lined ditch will be constructed under the bridge and through the construction area to maintain a continuously flowing stream. Any activity that temporarily diverts flow from the creek will trigger implementation of the following constraints.

- Before flow is diverted, cofferdams will be placed so that flow to river segments downstream from the construction site will not be interrupted.
- Subject to the sufficiency of ambient conditions, adequate fish passage conditions will be sustained by maintaining contiguous flows, avoiding the creation of vertical drops in excess of 15.2 centimeters (6 inches), and maintaining suitable water velocities (i.e., 2.4 meters [8 feet] per second or less) and water depths (minimum of 0.3 meter [1 foot]).

Measure 4: Avoid Stranding Impacts to Fish in Dewatered Areas
A qualified fish biologist will be onsite during the installation of cofferdams and during the cofferdam dewatering process to capture and move trapped salmonids and other fish. The fish will be relocated to the nearest suitable habitat unaffected by construction activities and upstream of the work area. Within temporarily drained stream channel areas, salvage activities shall be initiated before or at the same time as stream area draining and completed within a timeframe necessary to avoid injury and mortality of steelhead. Protocols for the capture, handling, and release of fish will be developed in cooperation with NOAA Fisheries, CDFG, the City, and Caltrans. Fish biologists will contact NOAA Fisheries and CDFG immediately if any steelhead are found dead or injured.

Measure 5: Avoid and Minimize Impacts to Spawning Habitat
The City will, to the extent practicable, avoid disturbance to any spawning gravel beds located in the study area on San Luis Obispo Creek. If disturbance to the gravel cannot be avoided, the gravel will be removed temporarily and replaced to pre-disturbance conditions. Before returning gravels to the channel following construction, gravels will be washed to remove fines before they are placed back into the creek channel. If it becomes necessary to augment disturbed gravels with gravel from outside sources, only washed river gravel (to remove fines) appropriately sized for adult steelhead, (0.5 inch to 3.0 inches) will be used.

Measure 6: Minimize Noise Impacts from Pile Driving
Potential injury and mortality associated with pile driving will be avoided or minimized by the following measures:

- In-channel construction will be limited to the summer low-flow period (June 1 to October 31) when stream flow in the creek is typically low, thereby minimizing the potential for sound pressure waves to travel long distances.
- Restriction of pile driving activities to the low-flow period coincides with the least likely occurrence of upstream migrating adults and downstream steelhead smolt migration.
- The smallest pile driver and minimum force necessary will be used to complete the work.
- Pile driving will be done within the dewatered cofferdams.

Measure 7: Replace Temporarily and Permanently Impacted Riparian Forest Vegetation
This minimization measure replaces temporary and permanent construction-related loss of streamside vegetation, including both riparian vegetation and shaded riverine aquatic (SRA) cover (a component of riparian vegetation). SRA cover vegetation is defined as streamside vegetation growing at the interface between the wetted channel and the streambank and includes woody, terrestrial vegetation that extends over the wetted channel and associated tree roots and branches projecting into the water column. Because SRA cover typically is composed of riparian vegetation growing within 4.6 meters (15 feet) (horizontal distance) of the wetted channel, replacement mitigation for construction-related losses of SRA cover necessitates that riparian vegetation plantings occur within 4.6 linear meters (15 linear feet) of the wetted channel in order to be considered mitigation for impacts on SRA cover vegetation. Therefore, to be effective as mitigation for impacts on both riparian vegetation and SRA cover, this measure includes the requirement that riparian vegetation be replanted within 4.6 meters (15 feet) (horizontally) of the wetted channel until a minimum replacement ratio of 2:1 for affected SRA cover vegetation is met. Once the requirement for mitigation for SRA cover vegetation is met, the remainder of riparian vegetation mitigation can be replanted farther away than 4.6 meters (15 feet) from the channel.

The City will replace *temporary* construction-related loss of riparian forest vegetation and SRA cover vegetation at Prefumo Creek and San Luis Obispo Creek at a minimum ratio of 1:1 (1 hectare/acre restored for every 1 hectare/acre temporarily affected) by replanting the temporary access areas with the native species removed, including arroyo willow, California black walnut, black cottonwood, coast live oak, coyote brush, coffeeberry, California blackberry, and elderberry. Replanting at each creek will occur at the earliest opportunity following completion of construction activities and during the time of year when maximum survival of planted vegetation is assured

The City will replace *permanent* loss of riparian forest vegetation within and adjacent to the study area along Prefumo and San Luis Obispo Creeks at a minimum ratio of 2:1 (2 hectares/acres restored or created for every 1 hectare/acre permanently affected). This ratio will be confirmed through coordination with state and federal agencies as part of the permitting process for the proposed project. Replacement of this habitat would include enhancement of the creek corridor through removal of nonnative species such as giant reed, castor bean, poison hemlock, English ivy, Himalayan blackberry, and bigleaf periwinkle and replacing these plants with native riparian trees and shrubs.

With implementation of Alternative 3, enhancement of 0.66 hectare (1.64 acres) of existing riparian habitat within and adjacent to the study area can be achieved by removing nonnative species (such as giant reed, castor bean, poison hemlock, English ivy, Himalayan blackberry, and bigleaf periwinkle and replacing these plants with native riparian trees and shrubs) and planting this area with native riparian trees and shrubs (such as arroyo willow, California black walnut, black cottonwood, coast live oak, coyote brush, coffeeberry, California blackberry, elderberry, mugwort, and other readily establishing native riparian forest species).

To replace SRA cover vegetation that is *permanently* lost as a result of the project, a minimum of 158 linear meters (520 linear feet) of stream bank would need to be planted with riparian vegetation to meet the minimum 2:1 replacement ratio identified for permanent impacts on SRA cover vegetation. To meet this mitigation requirement, SRA cover vegetation can be planted on either bank. The total bank length replanted must equal at least 158 linear meters (520 feet) or 79 meters (260 feet) of stream length assuming both banks are planted. To replace SRA cover vegetation that is *temporarily* lost, a minimum of 195 meters (640 linear feet) of stream bank would need to be planted to meet the minimum 1:1 replacement ratio.

The riparian enhancement areas could occur within the study area and the exact location would be determined in coordination with Caltrans and the City. Plantings will consist of cuttings taken from local plants, or plants grown from local material obtained within the Prefumo and San Luis Obispo Creek watersheds. Plantings will be monitored annually for 3 years, or as required in the project permits. A minimum of 75% of the plantings will survive at the end of the monitoring period. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated until the survival criterion is met.

Measure 8: Minimize Loss of Steelhead Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization

The potential for loss of steelhead spawning and rearing habitat will be avoided or minimized by the following measures:

- the amount of riparian vegetation removal, including vegetation providing SRA cover, substrate, and instream woody material necessary to ensure suitable fish passage conditions will be minimized, and existing spawning and rearing habitat will be maintained;
- disturbance to the stream width, depth, velocity, and slope will be minimized and modified or disturbed portions of the stream, banks, and riparian areas will be restored as nearly as possible to their preproject contours (i.e., elevations, profile, and gradient);
- native riparian vegetation and/or large woody material will be included where rock slope protection (RSP) is needed, either by burying the RSP and planting vegetating on the reconstructed banks, or by incorporating vegetation and woody material directly into the RSP;
- environmentally sensitive areas will be fenced to prevent encroachment of equipment and personnel into riparian areas, stream channels, and banks to the maximum extent practicable;

- disturbance and removal of aquatic vegetation will be avoided to the extent practicable; temporary fills, coffer dams, and other in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality and restores pre-existing streambed gradient and contours;
- fine sediments removed downstream of the LOVR bridge (approximately 1,022 square meters (11,000 square feet)) will be removed only from floodplain surfaces and no sediment will be removed from the low-flow channel; and
- substrate in the low-flow channel, including gravel supporting spawning habitat, that is removed during project construction will be set aside, washed to remove fines, and then returned to the channel following completion of project construction. If it is determined that a net loss in spawning gravel area occurs as a result of project construction, the City will augment gravels in the construction area with appropriately-sized spawning gravels (0.5 inch to 3.0 inches).

Measure 9: Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks

The potential for substantial increases in water temperature will be avoided or minimized by the following measures:

- exclusionary fencing will be used to minimize the potential for the accidental removal of more vegetation than is necessary to complete construction;
- soil compaction will be minimized by using equipment that can reach over sensitive areas, thereby ensuring suitable soil conditions for mitigation plantings;
- disturbance to the stream width, depth, velocity, and slope will be minimized, and modified or disturbed portions of the stream, banks, and riparian areas will be restored as nearly as possible to their preproject contours (i.e., elevations, profile, and gradient); and
- gaps in the post-construction canopy (i.e., shade), will be reduced by restricting extensions of streambank RSP or other bank protection (e.g., sheet piles or bank and channel armoring) to the minimum necessary to protect essential infrastructure.

1.7 Summary of Consultation to Date

During preparation of this document, Jones & Stokes did not meet with any resource agencies. Jones and Stokes' wildlife biologists met with both Caltrans and City biologists on April 4, 2006 in the field at the project site. During this meeting, it was determined that a protocol-level California red-legged frog survey was necessary, and that existing regional data indicated that the project area provides spawning and rearing habitat for south-central California coast steelhead.

Chapter 2 Listed and Proposed Species Potentially in the Biological Study Area

Table 2-1. Listed and Proposed Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
South-Central California Coast steelhead	*Oncorhynchus mykiss*	T/CH	Coldwater anadromous streams	P	The project is located in coastal freshwater stream habitats draining to San Luis Obispo Bay. Project site is included in critical habitat.

Notes: Absent [A] means no further work needed. Present [P] means general habitat is present and species may be present. Critical habitat [CH] means that the project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Based on information obtained from the U.S. Fish and Wildlife Service (USFWS) and literature review, one special-status fish species is likely to be present in the project area, the south-central California coast steelhead distinct population segment (DPS). The south-central California coast steelhead DPS has been listed as threatened under ESA (62 Federal Register [FR] 43937, August 18, 1997, January 5, 2006) and critical habitat is designated within the project area. Tidewater gobies are not likely to occur at the project site because the project site lacks the specific habitat required. California red-legged frog are also present in the project area; a separate BA (LSA Associates 2006) has been prepared for this species.

Chapter 3 Study Methods

3.1 Studies Required

Potential biological resource issues associated with the proposed action were identified through consultation with Caltrans and City biologists and through field investigations, review of existing information, and photographs of the project site. Based on this information, it was determined that studies necessary for the proposed project included an habitat evaluation to determine whether there is suitable habitat in the study area for federally listed species, a BA for south-central California coast steelhead, and a BA for California red legged frogs. The BA for California red-legged frog was completed separately by LSA Associates (2006) and is included as Appendix F in the project Natural Environment Study.

The following information was used during preparation for this BA:

- USFWS list of special status species for the project region generated using the online list generator (http://www.fws.gov/ventura/es/spplist/species_slo.cfm) (Appendix A).
- Distribution and Abundance of Steelhead in the San Luis Obispo Creek Watershed, California (Payne & Associates 2004); and
- professional knowledge.

3.2 Personnel and Survey Dates

No fisheries surveys were conducted for this project. A Jones & Stokes wildlife biologist took photographs of the project site on February 24 and July 18, 2006 and these photographs were used in the fisheries habitat assessment.

3.3 Agency Coordination and Professional Contacts

During preparation of this document, Jones & Stokes did not meet with any resource agencies. Jones and Stokes met with both Caltrans and City biologists on April 4, 2006 in the field at the project site. During this meeting, it was determined that a protocol-level California red-legged frog survey was necessary, and that existing regional data indicated that the project area provides spawning and rearing habitat for south-central California coast steelhead.

3.4 Limitations That May Influence Results

The presence and impact assessments on sensitive fish species depend largely on previously collected data, general species life history accounts, and literature reviews. San Luis Obispo Creek has been sampled numerous times over the years to assess steelhead distribution and habitat. Therefore, there were sufficient data available to assess the project impacts.

Chapter 4 Results: Environmental Setting

4.1 Description of Existing Biological and Physical Conditions

4.1.1 Study Area

The biological study area (study area) includes portions of U.S. 101, LOVR, Calle Joaquin Road, and South Higuera Street and incorporates the limits of construction associated with Alternative 3 (Figure 4-1). Representative photos of the study area are provided in Appendix B. The study area occurs around the existing LOVR and U.S. 101 Interchange and land use in the study area are primarily urban and agricultural.

4.1.2 Physical Conditions

The study area is within the outer South Coast Range geographic subdivision of the Central Western Region in the California Floristic Province (Hickman 1993). The study area is in San Luis Obispo County within the San Luis Obispo and Pismo Beach 7.5-minute U.S. Geological Survey (USGS) quadrangles. In the San Luis Obispo quadrangle the study area is in both an unnamed section and Section 3, Township 31 south, Range 12 east. The portion of the study area located in the Pismo Beach quadrangle is in both an unnamed section and Section 10, Township 31 south, Range 12 east. Topography in the overall study area is fairly level. Elevations in the study area are approximately 30.5 meters (100 feet) to 36.6 meters (120 feet) above sea level.

The study area is within the Central Coastal hydrologic unit. Three major creeks cross the study area: Froom, Prefumo and San Luis Obispo Creeks. Froom Creek drains to San Luis Obispo Creek from the west, crossing under Calle Joaquin Road and U.S. 101 in an existing reinforced concrete box (RCB) culvert. Prefumo Creek drains to San Luis Obispo Creek immediately north of LOVR; the creek flows through RCB culverts under U.S. 101 and the southbound offramp to LOVR. San Luis Obispo Creek drains to San Luis Obispo Bay in the Pacific Ocean approximately six miles south of the study area. The creeks, seasonal drainages, and wetlands in the study area qualify as waters of the United States. Annual precipitation averages 35.6 to 63.5 centimeters (14 to 25 inches) in the project vicinity (Ernstrom 1984).

4.1.3 Biological Conditions in the Study Area

A total of 10 distinct vegetation community types was identified and mapped in the study area, including riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, perennial drainage, nonnative annual grassland, agricultural, ruderal, and developed/landscape. Of these, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage are potential waters of the United States. Figure 4-1 shows the locations of natural communities and other biological resources located in the study area.

The study area supports both common natural communities and natural communities of special concern. Common natural communities are habitats that have low species diversity, are widespread, reestablish naturally after disturbance, or support primarily nonnative species. These

communities are not generally protected by agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). The common natural communities in the study area are nonnative annual grassland, agricultural, ruderal, and developed/landscape. Table 4-1 shows the temporary and permanent impacts to the biological communities in the study area.

Table 4-1. Biological Communities Affected in the Study Area

Community Type	Alternative 3	
	Permanently Affected Hectares (Acres)	Temporarily Affected Hectares (Acres)
Riparian forest	0.16 (0.40)	0.34 (0.84)
Seasonal wetland (J)	0.01 (0.03)	0 (0)
Seasonal wetland (NJ)	0.07 (0.17)	0 (0)
Seasonal drainage	0.02 (0.04)	0 (0)
Perennial drainage	0.03 (0.07)	0.08 (0.19)
Nonnative annual grassland	0.51 (1.26)	0 (0)
Agricultural	0.06 (0.14)	1.97(4.87)
Ruderal	1.31 (3.24)	0.08 (0.20)
Developed/landscape	3.77 (9.35)_	0.09 (0.23)
Total Affected Area	**5.95 (14.70)**	**2.56 (6.33)**

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important. The California Natural Diversity Database (CNDDB) contains a current list of rare natural communities throughout the state. USFWS considers certain habitats, such as wetlands and riparian forest communities, important to wildlife, and the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency consider wetland habitats important for water quality and wildlife. The habitats in the study area that meet criteria for natural communities of special concern are riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, and perennial drainage. For the purpose of the BA, only fish sensitive habitats, such as riparian forest, seasonal wetland, freshwater marsh seasonal drainage, and perennial drainage are discussed in more detail below.

4.1.3.1 Central Coast Arroyo Willow Riparian Forest

The Central Coast arroyo willow riparian forest communities in the study area occur along Prefumo Creek and San Luis Obispo Creek west and east of LOVR. One small piece of riparian forest habitat also occurs near the realignment of Calle Joaquin. This community type is multi-layered with trees, small trees and shrubs, and herbaceous layers. Riparian forest vegetation occurs on both banks of the creeks and varies from approximately 23 meters (75 feet) wide on the upstream portion of Prefumo Creek in the study area to approximately 198 meters (650 feet) wide around the confluence of the two creeks. Dominant tree species in the Central Coast arroyo willow riparian forest community include arroyo willow, walnut, black cottonwood, and coast live oak. Common shrubs include coyote brush, California coffeeberry, California blackberry, and elderberry. Giant reed, an invasive species common in riparian forest areas, occurs in isolated clumps. Common herbaceous species in riparian forest habitat include poison hemlock, common horsetail, sweetclovers, mugwort, pearly everlasting, periwinkle, garden nasturtium, cocklebur, manroot, and chain speedwell.

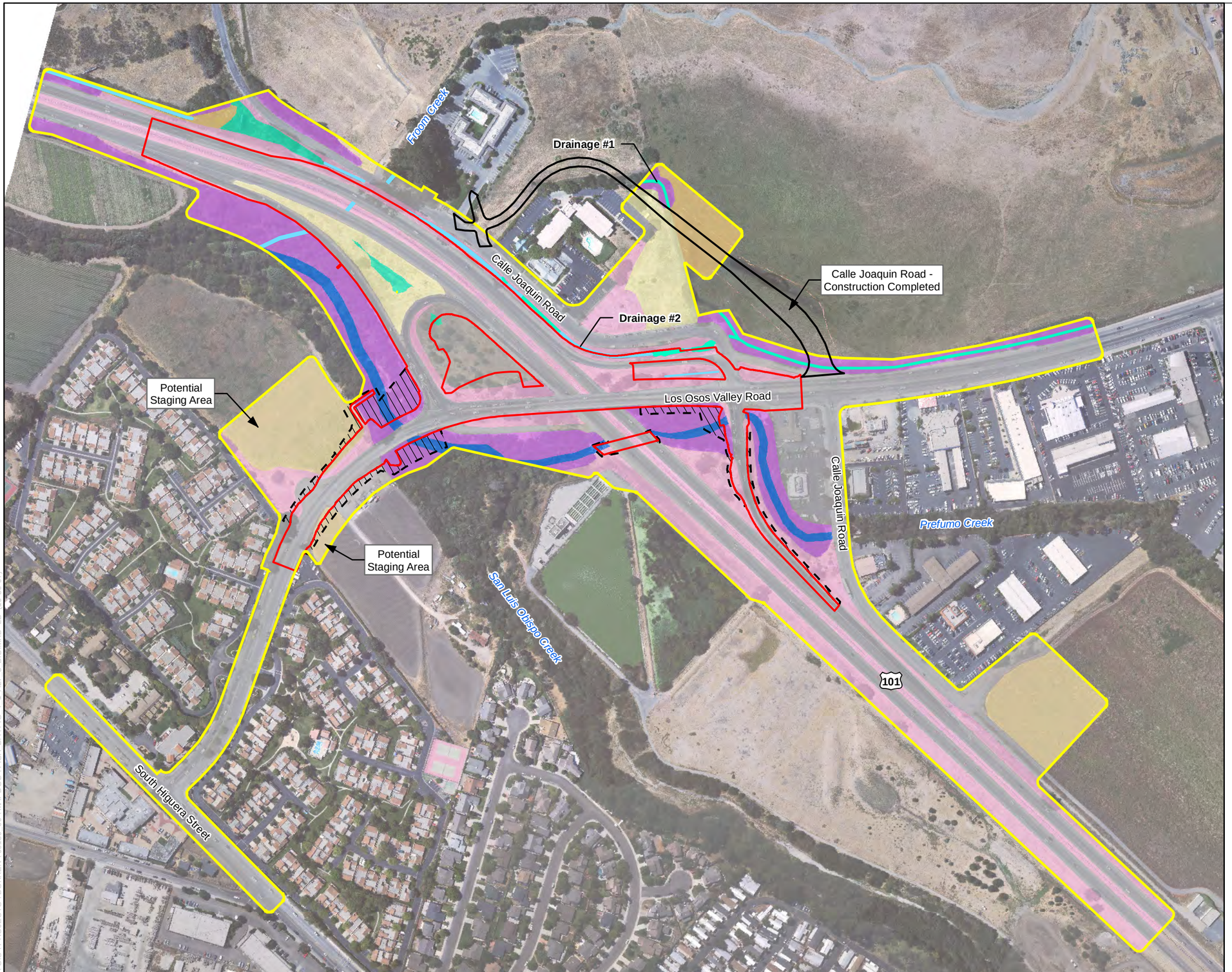


Figure 4-1
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Permanent Impact Area Under Alternative 3 (Minimum Build)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

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Feet

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In addition to providing potential nesting and perching habitat for a number of migratory birds and raptors and habitat for mammals and reptiles, riparian forest woodlands directly influences the quality of salmonid habitat, affecting cover, food, instream habitat complexity, and streambank stability. Riparian vegetation also moderates water temperatures by shading the stream from direct solar radiation and influencing the air temperature at the stream surface.

4.1.3.2 Seasonal Wetland

Seasonal wetland communities in the study area occur primarily associated with roadside drainages and basins south of LOVR. Two of the three areas mapped as seasonal wetland in the study area are located in the northbound on-ramp cloverleaf. These two seasonal wetlands are connected by a culvert under the on-ramp and receive runoff from the adjacent roads. Another mapped location is between the highway and Calle Joaquin where the roadside drainage widens to a basin beneath a billboard. This seasonal wetland receives runoff via the roadside drainage north of the wetland, which widens into a basin where the seasonal wetland and freshwater marsh occur. Common species in the seasonal wetlands include poison hemlock, Bermuda grass, birdfoot trefoil, Mediterranean barley, Italian ryegrass, curly dock, bristly ox-tongue, and Harding grass.

Seasonal wetlands support a large number of insects that constitute a food source for a variety of birds, amphibians, and reptiles. During the July 2006 field survey, a great egret (*Ardea alba*) and red-winged blackbirds (*Agelaius phoeniceus*) were observed in the vicinity of seasonal wetlands in the study area. Tall vegetation associated with the seasonal wetland on the west side of U.S. 101 may provide nesting habitat for migratory birds.

4.1.3.3 Freshwater Marsh

The study area supports two locations of freshwater marsh community. One freshwater marsh is located within the approved Calle Joaquin realignment project area in Froom Ranch at the base of the Irish Hills. Froom Creek, an intermittent stream within the study area, drains the eastern slopes of the Irish Hills and drains to San Luis Obispo Creek from the west, crossing under Calle Joaquin Road and U.S. 101 in an existing reinforced concrete box (RCB) culvert. The marsh feature is within the floodplain of Froom Creek and is in an area of high ground water (Morro Group, Inc. 2005). This feature has been previously delineated as part of the Calle Joaquin realignment project (Morro Group, Inc. 2004a). Portions of the marsh are perennially wet. Dominant plant species include iris-leaved rush, sedges, creeping leather root, coastal silverweed, bull thistle, birdfoot trefoil, goldentop, and meadow fescue. Dominant plant species in the wettest areas include tule, iris-leaved rush, seep monkeyflower, and watercress.

The other freshwater marsh is located between U.S.101 and Calle Joaquin. This feature appears to be perennial, possibly due to high ground water. Dominant species in this community include narrow-leaved cattail, iris-leaved rush, Himalayan blackberry, sneezeweed, and fringed willowherb.

4.1.3.4 Seasonal Drainage

Several seasonal drainages traverse the study area. Two seasonal drainages have been previously evaluated in a wetland delineation for the Calle Joaquin realignment project, and are referred to as Drainage 1 and Drainage 2 in that delineation (Morro Group, Inc. 2004a). Drainage 1 is spring fed and enters an underground culvert at its south end that emerges at the confluence with Froom

Creek on the west side of Calle Joaquin. Froom Creek, which is intermittent in the study area with a perennial reach upstream, crosses under U.S. 101 at this location to its confluence with San Luis Obispo Creek. Drainage 1 supports Central Coast arroyo willow riparian forest vegetation, dominated by arroyo willow, dogwood, California bay, California blackberry, and cattail.

Drainage 2 parallels LOVR and U.S. 101 and is fed by urban runoff. The north portion of Drainage 2 in the study area floods into the adjacent freshwater marsh under high flow conditions. The northern portion of Drainage 2 supports Central Coast arroyo willow riparian forest vegetation, including arroyo willow, poison hemlock, sweet fennel, teasel, and milk thistle. The southern portion along Calle Joaquin supports scattered arroyo willow and eucalyptus, coyote brush, poison hemlock, a small area of bulrush and cattail, and ruderal herbaceous species.

The study area also includes a seasonal drainage that parallels U.S. 101 and is separated from the southern end of Drainage 2 by a stand of eucalyptus. This drainage flows south and expands into a seasonal wetland in a basin area between U.S. 101 and Calle Joaquin. The lowest point of the basin supports freshwater marsh that appears to be perennial, and then continues to another segment of seasonal drainage at the southernmost part of the study area. The upstream portion of this seasonal drainage is dominated by coyote brush, California blackberry, poison hemlock, and mugwort. The southernmost end of the drainage supports Central Coast arroyo willow riparian forest, with some nonnatives, such as pepper tree.

A small segment of seasonal drainage lies between LOVR and the southbound on-ramp to U.S. 101. This feature is similar to Drainage 2 and is fed by runoff from the surrounding roads. A culvert connects this seasonal drainage to a patch of creeping wildrye surrounded by ruderal vegetation in an island between LOVR, Calle Joaquin, and a dirt road. The drainage supports a ruderal understory with several trees, including willow, eucalyptus, and pepper tree.

The value of seasonal drainages as wildlife habitat varies with the duration and intensity of water flow. During the wet season, intermittent drainages are used by a variety of wildlife species. Mammals such as raccoons and opossum use the habitats for drinking and washing their food. Shorebirds and waterfowl may use intermittent drainages for resting or foraging, whereas these habitats may serve as travel corridors for amphibians, invertebrates, or other highly aquatic wildlife. Wildlife species observed in or adjacent to seasonal drainages in the study area during the 2006 field surveys included great egret, song sparrow, and mallard.

4.1.3.5 Perennial Drainage

Two perennial drainages cross the study area, Prefumo Creek and San Luis Obispo Creek. Froom Creek, an intermittent stream within the study area, drains to San Luis Obispo Creek from an underground RCB culvert beneath Calle Joaquin Road and U.S. 101. Dense riparian forest vegetation borders both creeks throughout the study area, as described above in section 4.1.3.1.

Native fish species in San Luis Obispo Creek and Prefumo Creek include speckled dace (*Rhinichthys osculus*), prickly sculpin (*Cottus asper*), threespine stickleback (*Gasterosteus aculeatus*), south-central California coast steelhead and Pacific lamprey (*Lampetra tridentata*). Introduced species such as goldfish, largemouth bass, green sunfish, bluegill, mosquitofish,

channel catfish, brown bullhead, golden shiners, and fathead minnows are also present in the watershed (Tamagni 1995). Steelhead are also known to occur in Froom Creek upstream of the study area where perennial flow occurs.

4.1.3.6 Sensitive Fish Species

Based on a review of existing information, two sensitive fish species were identified as having the potential to occur within the project region. Of the two sensitive fish species, tidewater goby would not occur at the study area because it lacks suitable habitat conditions for the species. The study area is located approximately 12.9 kilometers (8 miles) upstream from San Luis Obispo Bay and the closest CNDDB (2006) record for the species occurs at least 8.0 kilometers (5 miles) downstream from the study area. No tidewater goby have been observed in the San Luis Obispo Creek in the vicinity of the study area during previous fish surveys (Otte pers. comm.). One sensitive fish species—south-central California coast steelhead, is known to occur in the study area and may be affected by construction activities.

Chapter 5 Results: Biological Resources, Discussion of Impacts and Mitigation

5.1 Federally Listed or Proposed Fish Species Occurrences

Steelhead (*Oncorhynchus mykiss*) which occur in San Luis Obispo and Prefumo, and Froom Creeks fall into the geographic range of the south-central California coast steelhead DPS (62 FR 43937, August 18, 1997). The south-central California coast steelhead DPS is listed as threatened under ESA (62 FR 43937, August 18, 1997; 71 FR 834, January 5, 2006). Presently, San Luis Obispo and Prefumo Creeks, including those segments within the project area, are known to support steelhead. Froom Creek also supports steelhead year-round; however, the creek is perennial only in the upper watershed (i.e., upstream of the study area) and is intermittent within the study area where the creek flows through an existing RCB culvert under Calle Joaquin Road and U.S. 101. It is assumed that the reach of Froom Creek within the study area provides only migratory habitat for adult and juvenile steelhead. The National Marine Fisheries Service (also known as NOAA Fisheries) designated San Luis Obispo, Prefumo, and Froom Creeks as critical habitat for steelhead in 2005 (70 FR 52574, September 2, 2005). Critical habitat for steelhead includes those reaches of the three creeks within the study area.

5.1.1 South-Central California Coast Steelhead

The south-central California coast steelhead DPS includes river basins below natural and constructed barriers in streams from the Pajaro River (inclusive) south to, but not including the Santa Maria River, California. The abundance of steelhead populations in this DPS is not known; population data are lacking for the Pajaro and Salinas River basins, the two largest river systems within the range of the DPS. However, recent presence/absence data showed that steelhead are present in approximately 86 to 95 percent of historically occupied streams within the range of the DPS (the uncertainty of occupancy is due to lack of population data for three streams within the range of the DPS as a result of access issues) (71 FR 851).

Only winter steelhead occur in the south-central California coast steelhead DPS (61 FR 41541–41561, August 9, 1996). Generally, adult south-central California coast steelhead may start to enter fresh water in December, with most migration occurring from January through March (The Habitat Restoration Group 1997). The timing and rate of adult migration depend on several factors, including stream discharge and water temperatures. The preferred migration temperatures for adult steelhead range between 7.8 and 11.1ºC (46 and 52ºF) (National Marine Fisheries Service 2000). Spawning can occur either shortly after freshwater entry or some time later, depending on the sexual maturity of the fish, but probably peaks from January through March. Adult steelhead spawn in shallow redds (nests) constructed in relatively clean, loose gravels, typically at the tail-end of pools and at the head of riffles, where appropriate water depths and velocities for spawning and egg incubation occur. Unlike all Pacific salmon, which die after spawning, adult steelhead may survive after spawning and are capable of returning to

the ocean, typically by June of the same year (Shapovalov and Taft 1954). A small percentage of these adults may return to spawn up to three more times; however, mortality rates are generally high from year to year and so multiple spawnings are typically the exception rather than the rule (Moyle 2002).

Steelhead eggs incubate in the gravel and hatch after about 19 days in 15.5°C (60°F) water and in about 80 days at 4°C (40°F). The average incubation period is approximately 4 to 6 weeks. After hatching, the young fish (alevins) remain in the gravel for an additional 2 to 6 weeks before emerging and taking up residence in the shallow margins of the stream. The juvenile fish feed primarily on aquatic and terrestrial insects for periods ranging from less than 1 year to 4 years. Most juvenile steelhead spend 1 to 3 years in fresh water before emigrating to the ocean as smolts (Shapovalov and Taft 1954).

Steelhead smolts, those juveniles developed sufficiently to live in saltwater, typically migrate to the ocean as flow declines and water temperature increases in April, May, and June. Before their downstream migration, juveniles undergo physiological changes (smoltification) to prepare them for life in the saltwater of the ocean. Steelhead live in the ocean for 1 to 3 years before maturing and returning to fresh water to spawn. Because juvenile steelhead rear year-round in fresh water, adequate flows and water temperatures and an abundant food source are necessary throughout the year to sustain steelhead populations. Conditions adequate to sustain steelhead populations are especially important during summer, when declining flows could reduce habitat availability, water temperatures might exceed the species' tolerance levels, and rearing juveniles experience increased competition for living space and food.

5.1.1.1 Survey Results

Review of available literature and data sources of species occurrence indicates that south-central California coast steelhead persist in streams that pass through the project area. A species occurrence list generated by USFWS indicates that south-central California coast steelhead are likely to occur in streams within the study area (Appendix A). The following information on steelhead abundance and distribution within streams that pass through the study area is summarized from Thomas R. Payne & Associates who mapped surface flow conditions and conducted a detailed analysis of steelhead abundance and distribution for select pool habitats in the San Luis Obispo Creek drainage during September and October 2003 (Thomas R. Payne & Associates 2004). Because this study was conducted in the fall prior to the winter rainy season, habitat conditions and steelhead occurrence observed during this study are likely indicative of average conditions during the summer.

San Luis Obispo Creek

Approximately 25.8 kilometers (16 miles) of San Luis Obispo Creek was surveyed beginning 2.9 kilometers (1.8 miles) upstream from the mouth of the creek to the upper extent of the wetted channel, 2.4 kilometers (1.5 miles) below Cuesta Pass. Three separate reaches of San Luis Obispo Creek were identified during the study: the lower, middle, and upper reach. The lower reach extended approximately 9.5 kilometers (5.9 miles) from 2.9 kilometers (1.8 miles) upstream of the creek mouth to the City's Water Reclamation Facility (WRF); the WRF is located a short distance upstream from the existing LOVR bridge over San Luis Obispo Creek. The middle reach extended approximately 7.7 kilometers (4.8 miles) from the WRF to the lowermost U.S. 101 bridge crossing located east of the City of San Luis Obispo. The upper

reach extended approximately 6 kilometers (3.7 miles) from U.S. 101 bridge crossing to the upstream limit of the wetted channel, which in 2003 was approximately 2.4 kilometers (1.5 miles) downstream from Cuesta Pass. Snorkel surveys and limited electrofishing surveys of select pool habitats in San Luis Obispo Creek indicated that young-of-year and juvenile steelhead were present in low but relatively constant densities throughout the main channel reaches of San Luis Obispo Creek (Thomas R. Payne & Associates 2004). In 2003, surface flow was present over a majority of the surveyed length of San Luis Obispo Creek. Surface flow was absent in three channel segments: a 2.6-kilometer (1.6-mile) segment extending upstream from near the WRF; a 1.3-kilometer (0.8 mile) segment extending upstream from near the downstream boundary of the upper reach; and the upper 2.4-kilometer (1.5-mile) segment of the watershed. Generally, stream flow in San Luis Obispo Creek was less than 0.06 cubic metes (2 cubic feet) per second upstream of the WRF; however, discharges to San Luis Obispo Creek from the WRF augmented natural creek flows by about 0.17 cubic meters (6 cubic feet) per second, resulting in a continuously wetted channel all the way to the creek mouth (Thomas R. Payne & Associates 2004). Juvenile steelhead populations downstream of the WRF outfall are likely supported by these releases (Spina et al. 2005, 919). Within the study area, San Luis Obispo Creek supports rearing habitat for juvenile steelhead, and is a known migration corridor for adult steelhead and outmigrating juveniles, including steelhead smolts. Juvenile trapping conducted near the WRF from mid-March to December between 2000 and 2002 indicated that steelhead smolt migration occurs from March through May, with a peak in April. However, some juvenile downstream migration has been observed to occur through December (Spina et al. 2005, 923-924). Gravel bars present in the vicinity of the LOVR bridge may also support spawning of adult steelhead, although to what extent adults use this habitat for spawning and successful incubation is supported is unknown.

Prefumo Creek

Prefumo Creek joins San Luis Obispo Creek immediately upstream of the LOVR bridge and approximately 61 meters (200 feet) downstream of the WRF outfall. The creek drains a watershed area generally to the west of San Luis Obispo Creek and flows through Laguna Lake, a natural waterbody that is located approximately 1.8 kilometers (1.1 miles) upstream from the San Luis Obispo Creek – Prefumo Creek confluence. During their survey of Prefumo Creek, Thomas R. Payne & Associates identified four separate reaches: the bottom, lower, middle, and upper reach. The bottom reach of Prefumo Creek, the lowermost portion of which occurs in the study area, extends from the creek's confluence with lower San Luis Obispo Creek, approximately 61 meters (200 feet) below the WRF outfall, to the weir that regulates water surface elevations in Laguna Lake. Where Prefumo Creek joins San Luis Obispo Creek, the creek is a deep, turbid, brushy slough that typically supports numerous large carp and, during fall, adult Chinook salmon (*O. tshawytscha*). A fishway, constructed in 2003, provides access for upstream migrating adult steelhead up to and through the reinforced concrete box (RCB) culvert located under U.S. 101. Upstream of the culvert and extending to Laguna Lake, Prefumo Creek was observed to be either dry or intermittent during the 2003 survey. Segments with intermittent flow consisted of stagnant pools containing dead carp. The generally intermittent nature of the creek in this reach and presence of dead carp suggest that this reach does not support summer rearing habitat for steelhead, at least in some years. Upstream of Laguna Lake, the Prefumo Creek channel was observed to be dry for the first 2.82 kilometers (1.75 miles). In this segment of the creek, identified as the lower reach, Prefumo Creek turns in a southwesterly direction where it begins its ascent into the hills above Los Osos Valley. A substantial increase

in gradient is present immediately downstream of the LOVR bridge, and access to upstream habitats is facilitated by a fish ladder through a concrete-lined portion of the creek. In 2003, the 0.68-kilometer-long (0.42-mile-long) middle reach was the only reach with surface flow. Young-of-year and juvenile steelhead were observed in pools habitats in this reach which was characterized as having a channel lined by grass rather than dense willows, vines, or brush and a relatively high levels of shade provided by a canopy of mature trees. Upstream of the middle reach, Prefumo Creek was dry for the remaining 4.3 kilometers (2.7 miles) of the watershed. Within the study area, Prefumo Creek supports migratory habitat for adult and juvenile steelhead. Summer rearing habitat may be available in wet years, but it is unknown to what extent this habitat supports summer rearing.

Based on the review of available information regarding the current abundance and distribution of steelhead within the two San Luis Obispo drainages, juvenile steelhead are likely to be present in the construction area during the summer construction period. Most steelhead smolts appear to emigrate before the summer construction season, although some juveniles have been observed to emigrate through December (Spina et al. 2005, 923–924). Adult spawning and adult and juvenile migration occur largely outside the summer construction period.

Froom Creek

Froom Creek drains a relatively small watershed area to the west of San Luis Obispo Creek and joins San Luis Obispo Creek a short distance downstream from the LOVR bridge. Three reaches were identified in Froom Creek during the 2003 investigations: the lower, middle, and upper reaches. Only the 1.14-kilometer-long (0.71-mile-long) middle reach had surface flow. Young-of-year and juvenile steelhead were collected from the sampled pool habitats. In general, Froom Creek was found to be densely vegetated and had one of the steepest gradients (>7%) of all the reaches surveyed. Instream cover was abundant as a result of the presence of boulder and cobble substrates and the dense scrub vegetation lining the creek.

Based on a review of available information regarding the current abundance and distribution of steelhead within Froom Creek, juvenile steelhead are not likely to be present in the construction area during the summer construction period. In addition, adult spawning and adult and juvenile migration occur largely outside the summer construction period and project construction will not affect migration of adults or juveniles into or out of Froom Creek because no changes to Froom Creek or the RCB culvert under Calle Joaquin Road and U.S. 101 are proposed.

5.1.1.2 Project Effects

The City forecasts the entire LOVR Interchange Improvement Project will take 3 dry seasons but work for the creek crossings and riparian areas will be restricted to 1 dry season. The number of working days in these sensitive areas will be determined during the permit phase but will not exceed 300 days.

Alternative 3 (i.e., the proposed action) consists of the following:

1. Extend existing San Luis Obispo Creek Culvert Crossing to accommodate widened LOVR.
2. Construct additional box culvert capacity under US-101 for Prefumo Creek.

3. Remove deposited material from SLO Creek bed under LOVR to restore design hydraulic capacity.
4. Widen/reconstruct US-101 northbound off-ramp and construct retaining wall to avoid creek impacts.
5. Widen US-101 southbound off-ramp and construct retaining walls.

A detailed description of the structural and non-structural features associated with the proposed action that will affect San Luis Obispo and Prefumo Creeks is provided below.

Structural Features

Los Osos Valley Road Bridge Widening and Culvert Extension

The existing LOVR bridge over San Luis Obispo Creek is a three arch reinforced concrete bridge. All three arches are lined with corrugated steel plates and measure approximately 50 feet long by 36 feet wide. The abutments and bents are reinforced concrete all of which are supported on reinforced concrete spread footings. The arch footings measure 12 feet wide by 64 feet long. The remaining 26 feet of channel width between the spread footings is natural soil.

Alternative 3 modifications would include extending the bridge deck and lengthening the three bottomless arch culverts on the south side of LOVR bridge by approximately 30 feet and constructing a cantilevered sidewalk on the north side to accommodate the bridge widening. Construction would require the removing of trees, vegetation, and other debris, the excavating of soil and in-channel substrates, and the operation of a fish bypass system. Backhoes, loaders, dump trucks, cranes, pile drivers, and a concrete delivery system would be operated as part of this construction.

Construction associated with in-channel construction is expected to last approximately 5 months and would be scheduled from June 1 to October 31 to ensure that in-channel work is completed within a single construction season of that year. In-channel construction would occur outside the primary migration season for adult and juvenile/smolt South-Central California Coast steelhead (*Oncorhynchus mykiss*) to minimize impacts on this species. Any work occurring before June 1 or after October 1 would be restricted to the channel above the Ordinary High Water Mark (OHWM) and the road or bridge surface only, with water quality control measures in place.

Most of the construction equipment will access the construction site from the south side of LOVR. Although unlikely, equipment access may also be needed from the north side of LOVR to construct the temporary cofferdams and to remove the bridge falsework and temporary cofferdams after construction is complete. Access from the south side would be through a temporary creek access easement located on the east bank of SLO Creek to the south of LOVR (Figure 1-2). A staging area potentially would be located immediately to the east of the temporary creek access easement, also to the south of LOVR.

Construction would require excavating the streambed on the south side of the LOVR bridge to expose the existing bridge footings and to facilitate pile driving, extending the culverts, and constructing the new bridge footings, bents, and abutments. Channel substrates (e.g., spawning

gravel) excavated or disturbed as part of the construction would be set aside for later use to restore the streambed to its pre-construction condition.

Construction of the bridge footing, bent, and abutment extensions would require that stream flow be diverted away from in-channel work sites. Stream flow would be diverted beginning upstream of the existing LOVR bridge and directed through the construction area in an open, earthen ditch. The ditch would be lined with plastic or other similar material to prevent water from seeping into the construction site. Stream diversion would extend from June 1 through October 31 to ensure that in-channel construction could be completed within a single construction season of that year.

With the exception of the bridge footing, bent, and abutment extensions, no other materials (e.g., RSP) would be placed in the channel at this location.

Pile Driving

Pile driving would occur at the LOVR overcrossing at Highway 101 and possibly at the SLO Creek bridge (Figure 1-2), with an impact hammer. Load bearing piles are typically driven with impact hammers where as sheet metal for coffer dams are driven with vibratory hammers. Proposed pile driving sites at the Highway 101 overcrossing are located approximately 150 to 175 feet from Prefumo Creek and a minimum of approximately 400 feet from SLO Creek. Pile driving associated with widening of the SLO Creek bridge would occur within 50 feet of SLO Creek. All pile driving would occur during the approved construction window of June 1 to October 1, thereby avoiding peak adult spawning migration and smolt emigration times. Approximately 500-650 strikes/pile would be needed to drive each pile into the substrate. Piles may need to be repositioned and time between driving events can range from 5 to 30 minutes. At San Luis Obispo Creek, five piles per day would be driven, taking approximately 15 days to complete. Along Prefumo Creek at the Highway 101 over crossing, pile driving would take approximately 20 days to complete. Pile driving noise impacts are anticipated to be 93dB l_{eq}, at a distance of 50 feet from the pile driving equipment. Noise thresholds are expected to be below the 211 dB level that causes injury to juvenile steelhead. The number of piles that would be hammered into place at each location are described as follows:

SLO Creek Bridge:	Abutment	1 = 16 piles 40 feet long each
	Pier	2 = spread footing, no piles
	Pier	3 = spread footing, no piles
	Abutment	4 = 16 piles 40 feet long each

Over crossing:	Abutment	1 = 16 piles 40 feet long each
	Bent	2 = 30 piles 40 feet long each
	Bent	3 = 30 piles 40 feet long each
	Abutment	4 = 16 piles 40 feet long each

Additional Box Culvert Capacity under Highway 101 at Prefumo Creek

The existing culvert under Highway 101 at Prefumo Creek consists of single, 8-foot tall by 18-foot wide concrete box culvert. The culvert is approximately 165 feet long and was retrofitted with a fishway in 2003 to facilitate fish passage. The fishway consists of a series of grouted step-pools in the RSP located at the downstream end of the culvert that lead to Washington baffles constructed out of poured concrete. The Washington baffles rest on the invert of the box culvert and facilitate fish passage through the culvert by maximizing flow depth and minimizing flow velocity over a range of stream flows. No modifications are proposed to the existing box culvert or fishway under Highway 101.

To increase flood event hydraulic capacity of the Prefumo Creek channel at Highway 101, two 7-foot diameter culverts would be constructed immediately to the north of and parallel to the existing box culvert under Highway 101. The two new culverts would be constructed at an elevation that is higher than the existing box culvert and fishway to provide additional capacity at the Highway 101 stream crossing during storm events without diverting flow from the active channel. The existing channel would be widened at the new culvert inlet and outlet to the north of the existing culvert to provide an overflow path into and out of the two new culverts. The proposed culverts would help to ameliorate the mid- and high-flow issues associated with the most upstream step pool, which is undersized for medium to high flows. Slope paving is proposed at the culvert inlet and RSP would be installed at the culvert outlet. Additional details pertaining to the RSP are described below under “Rock Slope Protection”. No stream diversions would be required as part of this construction.

Headwall Construction at Highway 101 Southbound Offramp Culvert

The existing culvert under the southbound Highway 101 offramp on Prefumo Creek consists of double, 8-foot tall by 12-foot wide concrete box culvert. Neither culvert contains a fishway; however, existing fish passage does not appear to be compromised because water from downstream backs up through this culvert (Stark pers. comm.). Proposed modifications to this culvert include only headwall construction and no modifications to the dimensions of the culvert are proposed.

To accommodate widening of the southbound Highway 101 offramp, the existing headwalls on the inlet and outlet of the existing culvert would be reconstructed, resulting in new headwalls that are 5 feet taller and 12 feet wider than the headwalls at the existing culvert. Construction of the new headwall would require that the existing box culvert be exposed requiring that soil excavation down to the bottom of the streambed. In addition to headwall construction, the existing culvert wingwalls would be removed at both locations and 15 feet of channel bank lining upstream of the culvert would be replaced with either new lining or RSP. Additional details pertaining to the RSP are described below under “Rock Slope Protection”. No additional length would be added to the existing culvert and no stream diversions would be required as part of this construction.

Rock Slope Protection

Rock slope protection is proposed only on Prefumo Creek; no new RSP would be installed on SLO Creek as part of LOVR bridge widening (Figure 1-2).

At the Highway 101 box culvert, RSP would be installed only on the downstream side of the two proposed 7-foot diameter culverts for a distance of 20 feet. The new RSP would extend along the slope of the north bank from the toe of the bank (i.e., starting immediately adjacent to the constructed step pools) to an elevation that matches the top of the two 7-foot diameter culverts. The RSP would be placed 1 foot below final grade at a thickness of 2.5 feet and would be revegetated to maintain natural banks. No RSP would be placed in the active channel, along the south bank, or on the inlet side of the existing or new culverts.

At the southbound Highway 101 offramp culvert, RSP would be placed only on the downstream side of the existing culvert for a distance of 15 feet. The downstream RSP would extend from the toes of the north and south banks to an elevation that matches the top of the new headwall on the respective banks. No RSP would be placed in the active channel. As discussed above, the RSP would be buried in place and revegetated to maintain natural banks.

Retention Basin and Storm Drain Modifications

An infiltration basin would be constructed between the mainline US 101 and the northbound offramp (Figure 1-2). The basin would collect stormwater from the eastern portion of the overcrossing and from the reconstructed onramp before ultimately draining into San Luis Obispo Creek. This treatment would allow pollutants to settle in the basin due to increased residence time in the basin and decreased discharge rates to San Luis Obispo Creek.

Widen/reconstruct US-101 Northbound Offramp and Construct Retaining Wall

The existing US-101 northbound offramp would be widened/reconstructed and a new retaining wall would be constructed adjacent to the modified offramp to avoid impacts on the creek (Figure 1-2). Ramp widening would require some removal of trees and vegetation to facilitate the increased footprint of the offramp and construction of the new retaining wall. Impacts on vegetation overhanging the SLO Creek (i.e., shaded riverine aquatic cover) and on the creek itself would be avoided, with water quality control measures in place.

Non-Structural Features

Sediment Removal

Sediments that have accumulated directly beneath the existing SLO Creek bridge have decreased the hydraulic capacity of the channel. These accumulated sediments are located on both floodplain benches from approximately 40 feet upstream to 60 feet downstream of the existing bridge, including the outer two arch culverts beneath the bridge, for a total linear distance of approximately 140 - 150 feet. A range of 2 to 10 vertical feet of sediment accumulation has occurred on the respective floodplains to a width approximately equal to the width of the outer two arch culverts.

To restore the original hydraulic capacity of the bridge structure and to prevent existing backwater effects upstream on Prefumo Creek from reoccurring, sediment would be removed from the outer two arch culverts and along the floodplain upstream and downstream of the existing bridge to an elevation of approximately 3 feet above the elevation of the existing low flow channel. Approximately 4,600 cubic yards of sediment, covering approximately 11,000 square feet of floodplain area, would be removed. No sediment would be removed from the existing wetted channel as part of sediment removal activities, thereby avoiding impacts on fish habitat, including spawning, rearing, and food-producing areas.

Implementation of the proposed project could result in the following impacts to south-central California coast steelhead. Impacts associated with the above activities include:

1. Increase in sedimentation and turbidity.
2. Release of contaminants and toxic materials.
3. Noise and disturbance.
4. Change in channel morphology and hydrology.
5. Loss and/or reduction of steelhead habitat (e.g., migration, spawning, and rearing habitat).

Possible project effects from bridge and road construction include impairment of fish survival due to contaminants; reduction of spawning or rearing habitat through increased input of sediment; impairment of fish passage and reduced availability of habitats resulting from changes in channel morphology and hydraulics; reduction of fish habitat through removal and destruction of cover; and disturbance, injury, or mortality of individual fish resulting from work in and adjacent to bodies of water or as a result of fish salvage and relocation efforts.

Impairment of Fish Survival, Growth, and Reproduction by Accidental Spills or Runoff of Contaminants

Construction activities would affect environmental conditions (i.e., physical, chemical, and biotic conditions) that can influence the extent and quality of fish species habitat and individually or synergistically determine the biological performance of species life stages and species populations. Contaminant pollution of water bodies is one mechanism through which fish species and their habitat could be affected.

Contaminants originate from the accidental spill, erosion, leaching, drift, or runoff of chemical and physical constituents that include sediment, oil and lubricants, concrete, and other chemicals used during maintenance, repair, and construction activities. Contaminants could be introduced to streams through any project action that includes:

- use of petroleum products for refueling and maintenance of construction equipment (potentially leading to accidental spills);
- roadway cleaning; and
- application and storage of construction materials;

Contaminants affect water quality constituent concentrations. The effect on fish and other aquatic species depends on the species' sensitivity to specific types and combinations of contaminants; the concentration, duration, and frequency of exposure; water temperature conditions; and other factors. Contaminants may reduce growth, reproduction, movement, and survival of individuals. Long-term or acute exposure over a substantial proportion of a species' habitat may reduce abundance, distribution, and production in the population and could affect the diversity of aquatic communities. Because construction activities are proposed to occur during the dry season (June 1 to October 31), adult and juvenile migration and adult spawning will not be affected by project activities. However, juveniles rearing in and around the project area could be affected by contaminants if accidental spills or unintended discharges were to occur.

Introduction of contaminants to streams would be avoided and minimized through implementation of **Measure 2, "Implement Water Quality Measures.**"

Reduction of Spawning or Rearing Habitat Quality or Quantity through Increased Input and Mobilization of Sediment

Disturbing soils and the bottoms of stream channels can increase erosion and the transportation of sediment to and within stream channels. Sediment is then deposited on the channel bottom, channel bank, and floodplain. The transport of sediment results in turbidity (i.e., the relative clarity of water that may be reduced by suspended sediment), which affects the behavior, growth, reproduction, and movement of fish and other aquatic organisms. Sediment deposition can alter channel morphology (e.g., fill pools; see definition of channel morphology below) and change the composition of gravel and other substrates, reducing the size of interstitial spaces and potentially affecting habitat availability and the survival of fish and other aquatic organisms.

The potential for erosion would increase during activities that disturb the soil, such as transporting, applying, or storing construction materials; removing riparian, wetland, or upland vegetation; and grading, clearing, and constructing access roads and work areas. In stream channels, sediment could be mobilized and transported by flow during removal of sediment from San Luis Obispo Creek; work in the stream channel; culvert and bridge construction; and pile driving.

The disturbance of soil and channel substrates and subsequent mobilization and transport to and within the stream channel would be avoided and minimized through implementation of **Measure 2, "Implement Water Quality Measures."** Implementation of these measures would avoid and impacts on the quality and quantity of steelhead spawning and rearing habitat.

Impairment of Fish Passage and Reduced Availability of Holding, Spawning, and Rearing Habitat Resulting from Changes in Channel Morphology and Hydraulics

Channel morphology describes the linear, aerial, and volumetric features of a channel, including depth, length, width, and the shape or configuration of the channel (e.g., the characteristics of secondary channels, riffles, runs, pools, backwaters, and sloughs). Channel morphology, along with flow, affects *stream hydraulics*, which refers to a stream's depth, surface elevation, velocity, and turbulence. Together, channel morphology and hydraulics influence the conditions that support fish migration and movement and provide holding, rearing, and spawning habitat. Channel morphology and hydraulics have a major effect on cover and water temperature.

The channel morphology and hydraulics of the creeks may change in response to project actions. Removal of riparian and aquatic vegetation and removal of sediment and debris from the stream channel could temporarily alter channel morphology and hydraulic conditions that support fish movement and spawning and rearing habitat conditions. The permanent change to channel morphology and hydraulics may result in permanent loss of spawning and rearing habitat.

The extension of culverts and the widening of LOVR bridge on San Luis Obispo Creek, and the construction of new culverts and installation of RSP on Prefumo Creek could permanently change hydraulic conditions, potentially affecting fish movement and migration in these creeks. Potential adverse effects of the San Luis Obispo Creek culvert extensions include the creation of excessive water velocities or shallow water depths, and increasing the distance that fish must negotiate these conditions during their upstream migration. Unfavorable passage conditions could result in delayed migration of juvenile and adult steelhead resulting from changes in hydraulic characteristics at this stream crossing. The potential for creating an impediment to fish passage from extending the arch culvert on San Luis Obispo Creek at the LOVR stream crossing would be avoided because the natural channel bottom would be maintained and the proposed removal of accumulated sediments in the outer two culverts and on the floodplain, in combination with the oversized nature of the culverts, would avoid or minimize the potential to create adverse hydraulic characteristics at this stream crossing relative to existing conditions.

The double 84-inch reinforced concrete pipe that will be added to the existing 18-by-8-foot concrete box culvert on Prefumo Creek will increase the capacity for flood flow conveyance under US-101 without affecting fish passage flows in the fishway. The extra capacity afforded by the new concrete pipe culverts on Prefumo Creek will avoid the need to modify the existing culvert and fishway under US-101, and may benefit fish passage conditions at this stream crossing by reducing the amount of flow entering the top step pool (which is undersized), and the resultant turbulence it creates. It is believed that the excessive turbulence compromises existing fish passage conditions at this stream crossing. The extra culvert capacity may reduce the volume of water entering the top step pool, and therefore the amount of turbulence in the pool. Consequently, existing fish passage conditions in Prefumo Creek at the US-101 stream crossing will either remain the same or improve slightly from construction of the extra culvert capacity.

Inchannel construction activities associated with the proposed project would require temporary redirection of the flow of water through the use of instream cofferdams and a temporary diversion channel. The temporary diversion channel would be approximately 240 feet long, and would consist of an open, earthen channel lined with plastic or other similar material to avoid water from seeping out of the channel. By proposing to use an open, but lined earthen channel to divert flows around construction areas, the City would minimize the potential for impeding the migration of adult and juvenile steelhead. In addition, the proposed construction period (June 1 – October 31) focuses on protecting migrating and spawning adult steelhead in the fall and winter and migrating juvenile steelhead in the spring. The earthen channel would be constructed to prevent the occurrence of unsuitable hydraulic conditions (e.g., shallow water depth or excessive water velocity) to further ensure that impacts on migrating adults or juveniles are minimized or avoided.

The adverse effects of temporary changes in channel morphology and hydraulics would be avoided and minimized through implementation of **Measure 8, "Minimize Loss of Steelhead**

Spawning and Rearing Habitat as a Result of Permanent Changes to Stream Hydraulics, Sediment Processes, and Channel Bottom Stabilization." Loss of spawning substrate and rearing habitat related to permanent changes in hydraulics, sediment processes, and channel bottom stabilization would also be minimized. These measures would ensure that the extension of culverts and the LOVR bridge would continue to support upstream and downstream fish passage to spawning and rearing habitat.

Reduction of Fish Habitat Quantity or Quality through Removal and Destruction of Cover

Cover describes the physical components of a stream environment that provide shelter and hiding, resting, rearing, holding and feeding areas for fish and other aquatic organisms. Gravel, cobbles, boulders, ledges, undercut banks, aquatic plants, saplings, brush, trees, and large woody debris (e.g., tree limbs, logs, rootwads) provide cover. The quantity and quality of cover for fish and aquatic invertebrates is a primary determinant of habitat availability and suitability. The occurrence of many aquatic species, including juvenile salmonids, depends on the size, density, and continuity of suitable cover.

For Alternative 3, construction activities associated with bridge widening would remove up to 274 linear meters (900 linear feet) of overwater riparian vegetation (SRA cover) along the stream banks. San Luis Obispo Creek will have 92 linear meters (300 linear feet) of SRA cover removed, and Prefumo Creek will have 184 linear meters (600 feet) removed. Of the total amount of SRA cover removed, 18 linear meters (60 linear feet) will be *permanently* removed along San Luis Obispo Creek, and 60 linear meters (200 linear feet) will be permanently removed along Prefumo Creek. These impact amounts represent affected bank lengths. For example, bridge widening on San Luis Obispo Creek would permanently affect 18 linear meters (60 linear feet) of the bank (i.e. 9 linear meters [30 feet] of linear stream length for the east and west bank).

Removal of riparian and aquatic vegetation and removal of sediment and debris from stream channels could temporarily remove cover that is an important component of adult holding and juvenile rearing habitat. The adverse effects of temporary changes in cover would be minimized through implementation of **Measure 7, "Replace Temporarily and Permanently Impacted Riparian Forest Vegetation."** The loss of cover related to permanent changes in stream channels and banks would also be minimized to the extent practicable.

Temperature-Related Reduction of Fish Survival, Growth, Movement, or Reproduction through Removal of Shade and Changes in Channel Morphology

Water temperature is primarily affected by weather; however, changes in channel morphology and removal of shade can change the response of water temperature to weather conditions. Many aquatic species, especially some life stages of salmonids, have narrow ranges of water temperature tolerance. Water temperatures outside the range of tolerance affect the growth, reproduction, survival, and movement of these fish, and ultimately affect habitat availability and species population abundance, distribution, and production. The magnitude, timing, frequency, duration, and rate of change in water temperature are important factors in the water temperature needs of each species life stage. Riparian vegetation will be temporarily or permanently removed during implementation of the proposed project. Removal of this vegetation would temporarily remove shade that is important for minimizing heat and maintaining water

temperatures that support fish life stages present, especially during warmer months. Permanent changes in channel morphology that involve reducing water depth or increasing stream surface area could result in warming of the streamflow.

The adverse effects of temporary changes would be avoided and minimized through implementation of **Measure 7, "Replace Temporarily and Permanently Impacted Riparian Forest Vegetation"** and **Measure 9, "Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks."** In addition, loss of shade, reduced depth, and increased stream surface area related to permanent changes in the stream channel and bank would be minimized to the extent practicable. Implementation of these measures would minimize or avoid the level of effects on water temperature that are likely to adversely affect juvenile steelhead.

Disturbance, Injury, or Mortality of Individual Fish Resulting from Work in and Adjacent to Bodies of Water

Disturbance exhibits itself in a change in the behavior of an individual organism, such as movement, cessation of feeding, or interruption of reproductive activities. Disturbance can be caused by human activities that generate sufficient noise, light, physical movement, or vibration to change the behavior of individual organisms. Disturbance may alter species survival if vulnerability to predation is increased or if the disturbance is of sufficient duration and magnitude to affect growth or reproductive success.

Direct injury and mortality result from physical trauma, which can be caused by direct and indirect contact with humans or machinery, sound pressure waves (pile driving), or physiological response to disturbance (e.g., shock). Direct injury may impair fish movement, feeding, and survival.

Researchers have suggested that salmonids can hear pile-driving noise approximately 2,000-feet from the source (Feist et al. 1992). Feist further concluded that pile driving did in fact alter the distribution and behavior of juvenile salmon. The potential impact to salmonids from pile driving activities depends on the distance and duration of pile-driving activities. The effects on fish can range from avoidance to direct mortality depending on the species, life stage, and intensity of the pressure waves. Factors that influence the intensity of pressure waves include proximity to the source, the maximum force generated and the rate at which it is generated, and the characteristics of the medium (e.g., water and substrate) through which the waves travel.

Noise thresholds for fish have not been set in either state or federal regulations, although NMFS uses a peak sound pressure level of 180 dB (re: 1 μPapeak) as a threshold for impacts to fish. Recent piledriving experiments using juvenile steelhead (*O. mykiss*) found no barotraumas (physical damage to body tissues caused by a difference in pressure between an air space inside or beside the body and the surrounding gas or liquid) with exposure to peak sound pressure levels as high as 211 dB (Caltrans 2005) and no statistically significant mortality at sound exposure levels (SEL) as high as 182 dB (re: dB re 1μPa2 sec) (Caltrans 2004). Interim recommendations by Popper et al. (2006) suggest using a combined single strike criteria for pile driving noise: a peak sound pressure of 208 dB (re: 1 μPapeak) and an SEL of 187 dB (re: dB re 1μPa2 sec).

Pile driving will occur on the banks of SLO Creek at the Highway 101 overcrossing and at the SLO Creek bridge (Figure 1-2) with an impact hammer. All piles will be driven during the construction window of June 1 to October 31, avoiding adult spawning migration and peak smolt emigration times. Approximately 500-650 strikes/pile will be needed to drive the pile into the substrate. Piles may need to be repositioned and time between driving events can range from 5 to 30 minutes. At San Luis Obispo Creek, five piles per day will be driven, taking approximately 15 days to complete. On Prefumo Creek at Highway 101 over crossing, pile driving will take approximately 20 days to complete. Anticipated pile driving noise impacts will be 93dB l_{eq}, 50 feet from the pile driving equipment. Noise thresholds will be below the 211 dB level that causes injury to juvenile steelhead.

SLO Creek Bridge:	Abutment	1 = 16 piles 40 feet long each
	Pier	2 = spread footing, no piles
	Pier	3 = spread footing, no piles
	Abutment	4 = 16 piles 40 feet long each
Overcrossing:	Abutment	1 = 16 piles 40 feet long each
	Bent	2 = 30 piles 40 feet long each
	Bent	3 = 30 piles 40 feet long each
	Abutment	4 = 16 piles 40 feet long each

Potential disturbance and injury of steelhead will be avoided or minimized by completing all in-water work within the summer low-flow season when fish are least likely to occur within the footprint of the project. However, the potential exists for juvenile steelhead to be present within the footprint of the project and subject to potential injury or mortality from construction activities (e.g., dewatering). The exclusion, capturing, handling, and relocation of fish can cause stress, injury, or mortality if not conducted properly. Potential effects will be temporary and should be limited to a relatively small portion of the total stream population of juvenile steelhead. The number of juveniles that will be subject to disturbance and injury will be small and not likely to have measurable effects on abundance or production. Except for pile driving and capturing and relocating fish, actions implemented next to streams may disturb fish but are unlikely to result in direct injury or mortality. Disturbance may result from the temporary movement of construction equipment and personnel, use of temporary lighting, removal of riparian vegetation, grading, and construction of access roads and staging areas.

The effect of disturbance on fish depends on the sensitivity of the species life stage and on the duration and frequency of disturbance. Disturbance may reduce feeding, interfere with reproduction, and cause movement from habitat. Movement could result in mortality attributable to predation. Fish capture and relocation may cause mortality as a result of stress from handling.

Disturbance and direct injury would be avoided and minimized through implementation of **Measure 6, "Minimize Noise Impacts from Pile Driving"** and **Measure 4, "Avoid Stranding Impacts to Fish in Dewatered Areas."**

5.1.1.3 Cumulative Effects (FESA)

The *Endangered Species Handbook* (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998) states that cumulative effects under the ESA include all future nonfederal actions "reasonably certain to occur" in the project area. Future federal actions that are unrelated to the proposed project are not considered in the cumulative effects analysis because these actions would require separate consultation pursuant to Section 7 of ESA.

Two nonfederal projects that potentially could affect the action area include the construction of a City-approved hotel along Calle Joaquin Road and implementation of a City creek maintenance program (consistent with the San Luis Obispo Creek Waterway Management Plan). The waterway management plan addresses and integrates environmentally responsible flood protection, channel maintenance, biotechnical bank stabilization, Phase II storm water quality management, stream restoration and habitat enhancement, and endangered species protection for the entire SLO Creek watershed.

When considering the construction of the new hotel, the scale and proximity of the project to San Luis Obispo and Prefumo Creeks, and the standard Best Management Practices that would be implemented, the proposed action is not likely to contribute to any cumulative effects. Because creek maintenance would be conducted within the context of the waterway management plan, and individual project actions would receive public and agency review, it is expected that impacts from the proposed action would be avoided or mitigated.
Continued urbanization of the San Luis Obispo area is expected to occur, especially following implementation of water supply projects, housing developments, and changes to the San Luis Obispo Area Plan. The effects of these new actions are likely to further reduce the conservation value of the habitat within the action area through increased input rate and volume of point and non-point source pollution to the creek, and altered hydrology from increased urban runoff (storm water and landscape irrigation).

5.2 Critical Habitat

Critical habitat, as defined in ESA Section 3, is:

I. the specific area within the geographic area occupied by a species, at the time it is listed in accordance with ESA, on which are found those biological features

   i. essential to the conservation of the species; and

   ii. that may require special management considerations or protection; and,

II. specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

NOAA Fisheries finalized critical habitat designations for south-central California coast steelhead in September 2005 (70 FR 52488, September 2, 2005) and was effective on January 5,

2006 (71 FR 834). All of the creeks potentially affected by project construction are designated as critical habitat for south-central California coast steelhead.

Critical habitat includes the stream channels in the study area and the lateral extent as defined by the OHWM. Critical habitat for south-central California coast steelhead is defined as specific areas that contain the primary constituent elements (PCEs) and physical habitat elements essential to the conservation of the species. The specific PCEs in the study area include:

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning incubation and larval development.
- Freshwater rearing sites with water quantity and quality and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

5.2.1 Effects of Project Action on Critical Habitat

San Luis Obispo Creek provides migratory, rearing and possibly spawning habitat in the study area. Prefumo Creek provides migratory and possibly rearing habitat for steelhead in the study area. Impacts to critical habitat would be the same the species effects described above in *Section 5.1.1.2, Project Effects*, and are summarized below as a sub-set of habitat-related effects of the action that were discussed more fully above.

<u>Freshwater Rearing Sites</u>

Water quantity and quality – Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Any water quality effects associated with sedimentation and turbidity and hazardous materials and contaminants on critical habitat will be temporary. Potential adverse effects of increased fine sediment and turbidity on critical habitat will be avoided or minimized through implementation of all applicable avoidance and minimization measures. Implementation of the SWWPP or WPCP in accordance with the General Permit along with applicable BMPs will substantially reduce or eliminate the potential adverse effects of turbidity and suspended sediment on critical habitat. The potential environmental effects of project actions will be limited to short-term, localized, and minor increases in turbidity and suspended sediment during construction.

BMPs will be implemented to avoid or minimize the potential for accidental spills and unintentional discharge of contaminants into streams and other water bodies. BMPs will also minimize or avoid the potential for spills to drainage channels and ditches that may not be considered critical habitat, but potentially convey runoff to downstream waters that are designated critical habitat. Implementation of the BMPs in accordance with an approved

SWWPP or WPCP will substantially reduce or eliminate the potential for accidental spills or unintentional discharges of potentially hazardous materials to streams and other water features that potentially could convey runoff to downstream waters. The potential for a project action to affect water quality, and affect critical habitat, will be avoided or minimized through incorporation of BMPs and conservation measures.

Avoidance and minimization measures will be implemented to avoid or minimize changes in water temperature. These measures focus on preservation and avoidance of existing riparian vegetation, with special emphasis on the protection of large streamside trees, shrubs, and instream woody material that may contribute significantly to stream shade and bank stability at the project site. To the extent practicable, avoidance measures will extend to the entire riparian zone and seek to maintain the area, density, and continuity of the vegetative canopy along the entire length of the site. With implementation of the measures, measurable long-term increases in water temperatures are not expected from changes in canopy coverage, channel width, and depths at the project site. The potential exists for short-term increases in water temperature during the establishment and growth of planted native vegetation but these increases are not likely to measurably affect rearing juveniles.

Floodplain connectivity – Project activities related to the removal of accumulated sediments in the vicinity of the LOVR bridge at San Luis Obispo Creek would restore floodplain connectivity at this location. Floodplain connectivity at other locations within the study area will not be changed by the proposed action.

Forage – Project activities could affect steelhead forage by removing riparian and SRA cover and disturbing channel substrates, thereby decreasing the abundance of aquatic insects (a prey item for fish) or their availability to juvenile steelhead. The proposed action would remove up to 274 linear meters (900 linear feet) of overwater riparian vegetation. On San Luis Obispo Creek, up to 92 linear meters (300 linear feet) of shaded riverine aquatic cover vegetation would be removed, and on Prefumo Creek, up to 184 linear meters (600 linear feet) of shaded riverine aquatic cover vegetation would be removed. Eighteen linear meters (60 linear feet) will be permanently removed in San Luis Obispo Creek, and 60 linear meters (200 linear feet) will be permanently removed in Prefumo Creek. In addition, up to 420 square meters (4,500 square feet) of channel substrate would be disturbed by construction activities; however, all in-channel substrate removed as part of Project activities would be replaced onsite immediately following Project construction and before the following spawning season. Riparian vegetation and SRA cover provide attachment sites for aquatic insects which then can drop into the stream and be available to foraging fish, while channel substrates are important food-producing area in streams, especially in riffle habitats. However, most riparian and overwater vegetation impacts will be temporary and compensatory measures would ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. In addition, substrates removed during project construction would be stored, and then washed to remove fines before being returned to the channel after construction is completed and before the cessation of the stream diversions. Because of the compensatory measures, the proposed action is not expected to have long-term effects on steelhead forage.

Natural cover – As stated above under "*Forage*", the proposed action would remove riparian and overwater vegetation on San Luis Obispo and Prefumo Creeks. However, most riparian and

overwater vegetation impacts will be temporary and compensatory measures will ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. Impacts on natural cover are expected to be short-term (5 to 7 years), as vegetation that is planted or that is naturally recruited at disturbed sites is reestablished.

Avoidance and minimization measures for temporary and permanent losses of riparian vegetation will be implemented to avoid or minimize the loss of cover (Measure 7).

Freshwater Migration Corridors

Water quantity and quality – Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Significant but short-term effects to water quality may occur during construction. Increases in turbidity are likely to be minimal, with water quality protection measures in place. Any increases in turbidity would likely dissipate quickly in time and space. See additional discussion on water quantity and quality above under "*Freshwater Rearing Sites*".

Free passage – Passage in San Luis Obispo and Prefumo Creeks will not be impeded by project activities (equipment operation, pile driving, sediment removal, and stream diversions). The proposed stream diversion will be restricted to the low-flow summer season and will avoid the primary migration period of adult and juvenile (including smolt) steelhead. In addition, the proposed culvert extension on San Luis Obispo Creek will not result in creating an impediment to fish passage because of the large size of the culverts compared to the flow volume that occurs when fish are migrating, and because no new hard surfaces will be added to the channel bottom at any of the stream crossings.

Avoidance and minimization measures will be implemented to avoid or minimize the adverse effects of changes in channel morphology and hydraulics. Implementation of the measures designed to maintain suitable passage conditions at culverts, bridges, and temporary in-channel structures will ensure continued access of adults and juveniles to available spawning and rearing habitat, maintaining function of critical habitat. Similarly, implementation of measures to ensure that any loss of critical habitat elements that support spawning and rearing is avoided or minimized to the greatest extent possible.

Natural cover – As stated above under "*Freshwater Rearing Sites*", the proposed action would remove riparian and overwater vegetation on San Luis Obispo and Prefumo Creeks. However, most riparian and overwater vegetation impacts will be temporary and compensatory measures will ensure that there would be no net loss of riparian and overwater vegetation in the affected streams. Impacts on natural cover are expected to be short-term (5 to 7 years), as vegetation that is planted or that is naturally recruited at disturbed sites is reestablished.

Freshwater Spawning Sites

Water quantity and quality - Project activities would not measurably affect water quantity or flows in San Luis Obispo or Prefumo Creeks. Significant but short-term effects to water quality may occur during construction. Increases in turbidity are likely to be minimal, with water quality protection measures in place. Any increases in turbidity would likely dissipate quickly in

time and space. See additional discussion on water quantity and quality above under "*Freshwater Rearing Sites*".

Spawning gravel quantity and quality – Project activities associated with bridge widening (e.g., excavation, pile driving, heavy equipment operation) would remove and potentially degrade existing spawning habitat in San Luis Obispo Creek, Up to 420 square meters (4,500 square feet) of channel substrate would be removed and/or disturbed by construction activities. These activities would occur during the summer low precipitation period and would avoid the adult spawning and egg incubation period.

Substrate, including gravel supporting spawning habitat, that is removed during project construction will be set aside, washed to remove fines, and then returned to the channel following completion of project construction. If it is determined that a net loss in spawning gravel area occurs as a result of project construction, the City will augment gravels in the construction area with appropriately-sized spawning gravels (0.5 inch to 3.0 inches). The proposed removal of accumulated sediments in the vicinity of and under the LOVR bridge would not affect spawning habitat in San Luis Obispo Creek. These accumulated sediments consist of finer substrate materials that exist on the floodplain and, therefore, are unsuitable as spawning habitat. The replacement, and augmentation (if needed), of affected spawning gravels at the end of the first construction season would ensure that these gravels would be suitable and available to adult steelhead the following winter, and that there would be no net loss of spawning habitat in the study area from the proposed action.

Water quality protection measures would avoid and minimize the potential to degrade spawning habitat by preventing erosion of disturbed soils, and by preventing sediment-laden runoff from entering watercourses.

Chapter 6 Conclusions and Determination

6.1 Conclusions

The bridge and road widening activities and on and off-ramp construction could adversely affect south-central California coast steelhead and their critical habitat. The removal of riparian vegetation along San Luis Obispo and Prefumo Creeks is likely to adversely affect rearing habitat for juvenile steelhead by reducing cover and shade. However, these affects largely would be temporary until planted vegetation becomes established in the affected areas. A mitigation measure to replace riparian vegetation, including SRA cover vegetation, at a 2:1 ratio or other ratio determined by the resource agencies will be executed. Additionally, removal of non-native plants in the study area and subsequent planting of native riparian vegetation will increase habitat values in affected areas. Changes in water temperature, channel morphology and hydrology could occur due to inchannel activities; however, measurable effects on water temperature are not anticipated because the anticipated amount of shade loss would be temporary, is relatively small, and shade loss would be partially offset by increased shading from the widened bridge . No impacts on migration and spawning would occur through avoidance of constructing during the primary adult and juvenile migration seasons. In addition, gravels that are disturbed during construction will be set aside, cleaned, and returned to the channel following construction, thereby avoiding any loss of spawning habitat or impacts on spawning fish. Disturbance, injury, and mortality of individual fish could occur from work in and adjacent to water bodies, from fish salvage and relocation activities, and from pile driving. In addition, incidental take of steelhead could occur during dewatering of the stream channel to isolate work areas for bridge pier construction and during pile driving.

Work associated with road and culvert widenings would result in temporary construction activity on LOVR and U.S.101 next to and crossing San Luis Obispo and Prefumo Creeks. No changes to Froom Creek would occur as part of the proposed project and effects on steelhead there would be avoided. Changes to the streams, both temporary and permanent, would occur, including removal of riparian streamside vegetation and disturbance to spawning gravels. However, the action is not expected to result in any long-term adverse effects on the stream or fish habitat, including spawning, rearing, or migratory habitat because of the avoidance and minimization measures, and the proposed mitigation for impacts remaining after construction. Various measures have been identified to avoid and reduce potential effects on listed species and critical habitat. Although various measures have been incorporated into the construction documents to minimize direct effects on steelhead, there is the potential for take of fish during construction. In addition, construction will adversely affect critical habitat for steelhead, although these effects largely would be temporary in duration.

6.2 Determination

Based on the a review of the current status of the south-central California coast (SCCC) steelhead DPS in the San Luis Obispo Creek watershed, and factoring in the effects of

constructing the Los Osos Valley Road/U.S.-101 Interchange Improvements Project, and cumulative effects in the action area, the analysis in this BA supports the conclusion that the proposed action will result in a "may affect, likely to adversely affect" determination for SCCC steelhead.

Essential features of critical habitat for SCCC steelhead include water quantity and quality, cover/shelter, shade, substrate, food, riparian vegetation, space, and safe passage conditions. The Los Osos Valley Road/U.S.-101 Interchange Improvements Project would result in short- and long-term habitat changes, but these changes would be small relative to the amount of habitat present within the watershed. The analysis contained with this BA supports the conclusion that the Los Osos Valley Road/U.S.-101 Interchange Improvements Project is likely to adversely affect critical habitat, but the proposed action would not appreciably diminish the value of the primary constituent elements that are essential to the conservation of the species.

The basis for these determinations are:

- The effects of the proposed action would be confined to the summer season to avoid effects on spawning and adult and juvenile migration, and when relatively few juvenile steelhead would be present in the study area;
- The number of steelhead juveniles or adults that may be injured or killed by the proposed action would be small compared to the number of individuals present within the San Luis Obispo Creek watershed and the larger SCCC steelhead DPS;
- The amount of critical habitat that would be affected by the proposed action is small compared to the total amount of critical habitat present in the San Luis Obispo Creek watershed and the larger SCCC steelhead DPS;
- Avoidance and minimization measures would reduce the potential for adverse effects to occur on steelhead individuals and their habitat, including critical habitat; and
- Compensatory measures would be implemented to replace affected habitats (e.g., riparian vegetation and SRA cover), resulting in no net loss of these habitats.

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7.2 Personal Communication

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Appendix A U.S. Fish and Wildlife Species List

U.S. Fish & Wildlife Service - Ventura Fish & Wildlife Office

Species Lists

back

Federal Endangered and Threatened Species that may be affected by projects in San Luis Obispo County

(38 Species)

Key

Type	Common Name	Scientific Name	Status	Date Listed	CH	CH Date	Occurs In
Amphibian	ARROYO TOAD	Bufo microscaphus californicus	Endangered	16-Dec-94	Yes	13-Apr-05	LA, MNT, SBA, VEN
Amphibian	CALIFORNIA RED-LEGGED FROG	Rana aurora draytonii	Threatened	23-May-96	Yes	13-Apr-06	LA, MNT, SBA, SBD, SBE, SCZ, SLO, VEN
Amphibian	CALIFORNIA TIGER SALAMANDER	Ambystoma californiense	Threatened	04-Aug-04	Yes	23-Aug-05	MNT, SBE, SCZ, SLO
Bird	BALD EAGLE	Haliaeetus leucocephalus	Threatened	11-Mar-67	No		INY, LA, MNO, MNT, SBE, SBR, SCZ, SLO, SBA, VEN
Bird	BROWN PELICAN	Pelicanus occidentalis	Endangered	02-Jun-70	No		MNT, SCZ, SLO, SBA, VEN
Bird	CALIFORNIA CLAPPER RAIL	Rallus longirostris obsoletus	Endangered	13-Oct-70	No		MNT, SCZ, SLO
Bird	CALIFORNIA CONDOR	Gymnogyps californianus	Endangered	11-Mar-67	Yes	22-Sep-77	KRN, LA, MNT, SLO, SBA
Bird	CALIFORNIA LEAST TERN	Sterna antillarum browni	Endangered	02-Jun-70	No		LA, MNT, SBA, SLO, VEN
Bird	LEAST BELL'S VIREO	Vireo bellii pusillus	Endangered	02-May-86	Yes	02-Feb-94	INY, KRN, LA, SBA, SBD, SBE, SCZ, SLO, VEN
Bird	WESTERN SNOWY PLOVER	Charadrius alexandrinus nivosus	Threatened	05-Mar-93	Proposed		LA, MNT, SBA, SLO
Bird	YELLOW-BILLED CUCKOO	Coccyzus americanus	Candidate	25-Jul-01	No		INY, KRN, LA, MNO, MNT, SBA, SBD, SBE, SCZ, SLO, VEN
Fish	SOUTHERN CALIFORNIA STEELHEAD	Oncorhynchus mykiss	Endangered	17-Jun-98	Proposed		LA, MNT, SBA, SLO, VEN
Fish	TIDEWATER GOBY	Eucyclogobius newberryi	Endangered	07-Mar-94	No		LA, MNT, VEN, SBA, SCZ, SLO
Invertebrate	LONGHORN FAIRY SHRIMP	Branchinecta longiantenna	Endangered	19-Sep-94	Yes	10-Feb-06	MNT, SBA, SBE, SLO, VEN
Invertebrate	MORRO SHOULDERBAND SNAIL	Helminthoglypta walkeriana	Endangered	15-Dec-94	Yes	07-Feb-01	SLO
Invertebrate	SMITH'S BLUE BUTTERFLY	Euphilotes enoptes smithi	Endangered	01-Jun-76	No		MNT, SLO
Invertebrate	VERNAL POOL FAIRY SHRIMP	Branchinecta lynchi	Threatened	19-Sep-94	Yes	10-Feb-06	MNT, SBA, SBE, SLO
Mammal	GIANT KANGAROO RAT	Dipodomys ingens	Endangered	05-Jan-87	No		SBA, SLO
Mammal	MORRO BAY KANGAROO RAT	Dipodomys heermanni morroensis	Endangered	13-Oct-70	Yes	11-Aug-77	SLO
Mammal	SAN JOAQUIN KIT FOX	Vulpes macrotis	Endangered	11-Mar-67	No		MNT, SBA, SBE,

		mutica					SLO
Mammal	SOUTHERN SEA OTTER	Enhydra lutris nereis	Threatened	14-Jan-77	No		MNT, SBA, SCZ, SLO, VEN
Plant	CALIFORNIA JEWELFLOWER	Caulanthus californicus	Endangered	19-Jul-90	No		SBA, SLO
Plant	CALIFORNIA ORCUTT GRASS	Orcuttia californica	Endangered	03-Aug-93	No		LA, SBA, SLO, VEN
Plant	CALIFORNIA SEABLITE	Suaeda californica	Endangered	15-Dec-94	No		SLO
Plant	CAMATTA CANYON AMOLE	Chlorogalum purpureum var. reductum	Threatened	20-Mar-00	Yes	24-Aug-02	SLO
Plant	CHORRO CREEK BOG THISTLE	Cirsium fontinale var. obispoense	Endangered	15-Dec-94	No		SLO
Plant	GAMBEL'S WATERCRESS	Rorippa gambellii	Endangered	03-Aug-93	No		SBA, SLO
Plant	INDIAN KNOB MOUNTAINBALM	Eriodictyon altissimum	Endangered	15-Dec-94	No		SLO
Plant	LA GRACIOSA THISTLE	Cirsium loncholepis	Endangered	20-Mar-00	Yes	17-Mar-04	SBA, SLO
Plant	MARSH SANDWORT	Arenaria paludicola	Endangered	03-Aug-93	No		SLO
Plant	MORRO MANZANITA	Arctostaphylos morroensis	Threatened	15-Dec-94	No		SLO
Plant	NIPOMO MESA LUPINE	Lupinus nipomensis	Endangered	20-Mar-00	No		SLO
Plant	PARISH'S CHECKERBLOOM	Sidalcea hickmanii ssp. parishii	Candidate	28-Feb-96	No		SBA, SLO
Plant	PISMO CLARKIA	Clarkia speciosa var. immaculata	Endangered	15-Dec-94	No		SLO
Plant	PURPLE AMOLE	Chlorogalum purpureum var. purpureum	Threatened	20-Mar-00	Yes	24-Oct-02	MNT, SLO
Plant	SALT MARSH BIRD'S-BEAK	Cordylanthus maritimus ssp. maritimus	Endangered	28-Sep-78	No		SBA, SLO, VEN
Plant	SAN JOAQUIN WOOLY-THREADS	Lembertia congdonii	Endangered	19-Jul-90	No		MNT, SBA, SBE, SLO
Reptile	BLUNT-NOSED LEOPARD LIZARD	Gambelia silus	Endangered	11-Mar-67	No		LA, SBA, SBD, SBE, SLO, VEN

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Appendix B Representative Photographs

Photo 1. Looking Down Prefumo Creek at the Culvert under Highway 101 South-bound Offramp.

Photo 2. San Luis Obispo Creek Bridge Crossing at Los Osos Valley Road.

Photo 3. Upstream San Luis Obispo Creek North of Los Osos Valley Road.

Photo 4. Looking Downstream San Luis Obispo Creek South of Los Osos Valley Road.

06150.06 Fish BA (8-06)

Representative Photographs of Prefumo Creek and San Luis Obispo Creek in the Study Area

Photo 1. Seasonal Wetland South of Northbound Highway 101 Onramp.

Photo 2. Seaonal Wetland and Sycamore Woodland North of Northbound Highway 101 Onramp.

Photo 3. Looking South at Seasonal Wetland West of Highway 101.

06150.06 Fish BA (8-06)

Representative Photographs of Seasonal Wetlands in the Study Area

Appendix C California Natural Diversity Database List

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
1	Ablautus schlingeri Oso Flaco robber fly	IIDIP42010			GNR	S1	
2	Accipiter cooperii Cooper's hawk	ABNKC12040			G5	S3	SC
3	Accipiter striatus sharp-shinned hawk	ABNKC12020			G5	S3	SC
4	Agelaius tricolor tricolored blackbird	ABPBXB0020			G2G3	S2	SC
5	Agrostis hooveri Hoover's bent grass	PMPOA040M0			G3	S2.2	1B/2-2-3
6	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened		G2G3	S2S3	SC
7	Anniella pulchra nigra black legless lizard	ARACC01011			G3G4T2T3Q	S2	SC
8	Anniella pulchra pulchra silvery legless lizard	ARACC01012			G3G4T3T4Q	S3	SC
9	Antrozous pallidus pallid bat	AMACC10010			G5	S3	SC
10	Arctostaphylos cruzensis Arroyo de la Cruz manzanita	PDERI040B0			G2	S2.2	1B/2-2-3
11	Arctostaphylos luciana Santa Lucia manzanita	PDERI040N0			G2	S2.2	1B/2-2-3
12	Arctostaphylos morroensis Morro manzanita	PDERI040S0	Threatened		G2	S2.2	1B/2-3-3
13	Arctostaphylos osoensis Oso manzanita	PDERI042S0			G1	S1.2	1B/3-2-3
14	Arctostaphylos pechoensis Pecho manzanita	PDERI04140			G2	S2.2	1B/2-2-3
15	Arctostaphylos pilosula Santa Margarita manzanita	PDERI04160			G2	S2.2	1B/3-2-3
16	Arctostaphylos rudis sand mesa manzanita	PDERI041E0			G2	S2.2	1B/2-2-3
17	Arctostaphylos tomentosa ssp. daciticola dacite manzanita	PDERI041HD			G4T1	S1.1	1B/3-3-3
18	Arctostaphylos wellsii Wells's manzanita	PDERI042B0			G2	S2.1?	1B/2-3-3
19	Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1.1	1B/3-3-2
20	Areniscythris brachypteris Oso Flaco flightless moth	IILEG49010			GNR	S1	
21	Astragalus didymocarpus var. milesianus Miles's milk-vetch	PDFAB0F2X3			G5T2	S2.2	1B/2-2-3
22	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
23	Atriplex joaquiniana San Joaquin spearscale	PDCHE041F3			G2	S2.1	1B/2-2-3

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
24	Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3	
25	Calochortus obispoensis San Luis mariposa lily	PMLIL0D110			G2	S2.1	1B/2-2-3
26	Calochortus simulans San Luis Obispo mariposa lily	PMLIL0D170			G2	S2.3	1B/2-1-3
27	Calystegia subacaulis ssp. episcopalis Cambria morning-glory	PDCON040J1			G3T1	S1.2	1B/3-2-3
28	Carex obispoensis San Luis Obispo sedge	PMCYP039J0			G2	S2.2	1B/2-2-3
29	Castilleja densiflora ssp. obispoensis Obispo Indian paintbrush	PDSCR0D453			G5T2	S2.2	1B/2-2-3
30	Central Dune Scrub	CTT21320CA			G2	S2.2	
31	Central Foredunes	CTT21220CA			G1	S1.2	
32	Central Maritime Chaparral	CTT37C20CA			G2	S2.2	
33	Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1			G4T3	S3.2	1B/2-2-3
34	Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened		G4T3	S2	SC
35	Chlorogalum pomeridianum var. minus dwarf soaproot	PMLIL0G042			G5T1	S1.2	1B/2-2-3
36	Chlosyne leanira elegans Oso Flaco patch butterfly	IILEPJA051			G4G5T1T2	S1S2	
37	Chorizanthe breweri Brewer's spineflower	PDPGN04050			G2	S2.2	1B/3-1-3
38	Chorizanthe rectispina straight-awned spineflower	PDPGN040N0			G1	S1.2	1B/3-1-3
39	Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101			G5T2	S1	
40	Cirsium fontinale var. obispoense Chorro Creek bog thistle	PDAST2E162	Endangered	Endangered	G2T1	S1.2	1B/3-2-3
41	Cirsium loncholepis La Graciosa thistle	PDAST2E1N0	Endangered	Threatened	G2	S2.2	1B/3-3-3
42	Cirsium rhothophilum Surf thistle	PDAST2E2J0		Threatened	G2	S2.2	1B/2-2-3
43	Clarkia speciosa ssp. immaculata Pismo clarkia	PDONA05111	Endangered	Rare	G4T1	S1.1	1B/3-3-3
44	Coastal Brackish Marsh	CTT52200CA			G2	S2.1	
45	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1	
46	Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T2Q	S1	
47	Coelus globosus globose dune beetle	IICOL4A010			G1	S1	
48	Cordylanthus maritimus ssp. maritimus salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T2	S2.1	1B/2-2-2

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
49	Danaus plexippus monarch butterfly	IILEPP2010			G5	S3	
50	Deinandra increscens ssp. foliosa leafy tarplant	PDAST4R0U4			G4G5T2	S2.2	1B/2-2-3
51	Delphinium parryi ssp. blochmaniae dune larkspur	PDRAN0B1B1			G4T2	S2.2	1B/3-2-3
52	Dipodomys heermanni morroensis Morro Bay kangaroo rat	AMAFD03063	Endangered	Endangered	G3G4T1	S1	
53	Dithyrea maritima beach spectaclepod	PDBRA10020		Threatened	G2	S2.1	1B/3-3-2
54	Dudleya abramsii ssp. bettinae San Luis Obispo serpentine dudleya	PDCRA04011			G3T1	S1.2	1B/3-2-3
55	Dudleya abramsii ssp. murina San Luis Obispo dudleya	PDCRA04012			G3T2	S2.3	1B/2-1-3
56	Dudleya blochmaniae ssp. blochmaniae Blochman's dudleya	PDCRA04051			G2T2	S2.1	1B/2-3-2
57	Elanus leucurus white-tailed kite	ABNKC06010			G5	S3	
58	Emys (=Clemmys) marmorata pallida southwestern pond turtle	ARAAD02032			G3G4T2T3Q	S2	SC
59	Eremophila alpestris actia California horned lark	ABPAT02011			G5T3	S3	SC
60	Erigeron blochmaniae Blochman's leafy daisy	PDAST3M5J0			G2	S2.2	1B/2-2-3
61	Eriodictyon altissimum Indian Knob mountainbalm	PDHYD04010	Endangered	Endangered	G2Q	S2.2	1B/3-3-3
62	Eryngium aristulatum var. hooveri Hoover's button-celery	PDAPI0Z043			G5T2	S2.1	1B/3-3-3
63	Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered		G3	S2S3	SC
64	Falco mexicanus prairie falcon	ABNKD06090			G5	S3	SC
65	Fritillaria viridea San Benito fritillary	PMLIL0V0L0			G3	S3.2	1B/2-2-3
66	Helminthoglypta walkeriana Morro shoulderband (=banded dune) snail	IMGASC2510	Endangered		G1	S1	
67	Horkelia cuneata ssp. puberula mesa horkelia	PDROS0W045			G4T2	S2.1	1B/2-3-3
68	Horkelia cuneata ssp. sericea Kellogg's horkelia	PDROS0W043			G4T1	S1.1	1B/3-3-3
69	Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1			G4T3	S2.1	1B/2-3-2
70	Laterallus jamaicensis coturniculus California black rail	ABNME03041		Threatened	G4T1	S1	
71	Layia jonesii Jones's layia	PDAST5N090			G1	S1.1	1B/3-2-3

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
72	Lichnanthe albipilosa white sand bear scarab beetle	IICOL67010			G1	S1	
73	Linderiella occidentalis California linderiella	ICBRA06010			G3	S2S3	
74	Lupinus ludovicianus San Luis Obispo County lupine	PDFAB2B2G0			G2	S2.2	1B/3-2-3
75	Lupinus nipomensis Nipomo Mesa lupine	PDFAB2B111	Endangered	Endangered	G1	S1.1	1B/3-3-3
76	Monardella crispa crisp monardella	PDLAM18070			G2	S2.2	1B/2-2-3
77	Monardella frutescens San Luis Obispo monardella	PDLAM180X0			G2	S2.2	1B/2-2-3
78	Monardella palmeri Palmer's monardella	PDLAM180H0			G2	S2.2	1B/2-2-3
79	Necydalis rudei Rude's longhorn beetle	IICOL4P010			G1G3	S1S2	
80	Neotoma lepida intermedia San Diego desert woodrat	AMAFF08041			G5T3?	S3?	SC
81	Northern Coastal Salt Marsh	CTT52110CA			G3	S3.2	
82	Northern Interior Cypress Forest	CTT83220CA			G2	S2.2	
83	Nyctinomops macrotis big free -tailed bat	AMACD04020			G5	S2	SC
84	Oncorhynchus mykiss irideus steelhead - south/central California coast esu	AFCHA0209H	Threatened		G5T2Q	S2	
85	Phrynosoma coronatum (frontale population) Coast (California) horned lizard	ARACF12022			G4G5	S3S4	SC
86	Plebejus icarioides moroensis Morro Bay blue butterfly	IILEPG801B			G5T1T3	S1S3	
87	Poa diaboli Diablo Canyon blue grass	PMPOA4Z390			G1	S1.2	1B/3-2-3
88	Polyphylla nubila Atascadero june beetle	IICOL68040			G1	S1	
89	Progne subis purple martin	ABPAU01010			G5	S3	SC
90	Rallus longirostris obsoletus California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	
91	Rana aurora draytonii California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
92	Rorippa gambelii Gambel's water cress	PDBRA270V0	Endangered	Threatened	G1	S1.1	1B/3-3-2
93	Sanicula maritima adobe sanicle	PDAPI1Z0D0		Rare	G2	S2.2	1B/3-3-3
94	Scrophularia atrata black-flowered figwort	PDSCR1S010			G2	S2.2	1B/2-2-3
95	Senecio aphanactis rayless ragwort	PDAST8H060			G3?	S1.2	2/3-2-1

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
96	Serpentine Bunchgrass	CTT42130CA			G2	S2.2	
97	Sidalcea hickmanii ssp. anomala Cuesta Pass checkerbloom	PDMAL110A1		Rare	G3T1	S1.2	1B/3-2-3
98	Sterna antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2S3	
99	Streptanthus albidus ssp. peramoenus most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B/2-2-3
100	Suaeda californica California seablite	PDCHE0P020	Endangered		G1	S1.1	1B/3-3-3
101	Sulcaria isidiifera splitting yarn lichen	NLTEST0020			G1	S1.1	
102	Symphyotrichum defoliatum San Bernardino aster	PDASTE80C0			G3	S3.2	1B/2-2-3
103	Taricha torosa torosa Coast Range newt	AAAAF02032			G5T4	S4	SC
104	Taxidea taxus American badger	AMAJF04010			G5	S4	SC
105	Trifolium depauperatum var. hydrophilum saline clover	PDFAB400R5			G5T2?	S2.2?	1B/3-2-3
106	Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B/3-3-3
107	Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040			G2G3	S2S3	
108	Valley Needlegrass Grassland	CTT42110CA			G1	S3.1	

Appendix D U.S. Fish and Wildlife Service List

U.S. Fish & Wildlife Service - Ventura Fish & Wildlife Office

Species Lists

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Federal Endangered and Threatened Species that may be affected by projects in San Luis Obispo County

(38 Species)

Key

Type	Common Name	Scientific Name	Status	Date Listed	CH	CH Date	Occurs In
Amphibian	ARROYO TOAD	Bufo microscaphus californicus	Endangered	16-Dec-94	Yes	13-Apr-05	LA, MNT, SBA, VEN
Amphibian	CALIFORNIA RED-LEGGED FROG	Rana aurora draytonii	Threatened	23-May-96	Yes	13-Apr-06	LA, MNT, SBA, SBD, SBE, SCZ, SLO, VEN
Amphibian	CALIFORNIA TIGER SALAMANDER	Ambystoma californiense	Threatened	04-Aug-04	Yes	23-Aug-05	MNT, SBE, SCZ, SLO
Bird	BALD EAGLE	Haliaeetus leucocephalus	Threatened	11-Mar-67	No		INY, LA, MNO, MNT, SBE, SBR, SCZ, SLO, SBA, VEN
Bird	BROWN PELICAN	Pelicanus occidentalis	Endangered	02-Jun-70	No		MNT, SCZ, SLO, SBA, VEN
Bird	CALIFORNIA CLAPPER RAIL	Rallus longirostris obsoletus	Endangered	13-Oct-70	No		MNT, SCZ, SLO
Bird	CALIFORNIA CONDOR	Gymnogyps californianus	Endangered	11-Mar-67	Yes	22-Sep-77	KRN, LA, MNT, SLO, SBA
Bird	CALIFORNIA LEAST TERN	Sterna antillarum browni	Endangered	02-Jun-70	No		LA, MNT, SBA, SLO, VEN
Bird	LEAST BELL'S VIREO	Vireo bellii pusillus	Endangered	02-May-86	Yes	02-Feb-94	INY, KRN, LA, SBA, SBD, SBE, SCZ, SLO, VEN
Bird	WESTERN SNOWY PLOVER	Charadrius alexandrinus nivosus	Threatened	05-Mar-93	Proposed		LA, MNT, SBA, SLO
Bird	YELLOW-BILLED CUCKOO	Coccyzus americanus	Candidate	25-Jul-01	No		INY, KRN, LA, MNO, MNT, SBA, SBD, SBE, SCZ, SLO, VEN
Fish	SOUTHERN CALIFORNIA STEELHEAD	Oncorhynchus mykiss	Endangered	17-Jun-98	Proposed		LA, MNT, SBA, SLO, VEN
Fish	TIDEWATER GOBY	Eucyclogobius newberryi	Endangered	07-Mar-94	No		LA, MNT, VEN, SBA, SCZ, SLO
Invertebrate	LONGHORN FAIRY SHRIMP	Branchinecta longiantenna	Endangered	19-Sep-94	Yes	10-Feb-06	MNT, SBA, SBE, SLO, VEN
Invertebrate	MORRO SHOULDERBAND SNAIL	Helminthoglypta walkeriana	Endangered	15-Dec-94	Yes	07-Feb-01	SLO
Invertebrate	SMITH'S BLUE BUTTERFLY	Euphilotes enoptes smithi	Endangered	01-Jun-76	No		MNT, SLO
Invertebrate	VERNAL POOL FAIRY SHRIMP	Branchinecta lynchi	Threatened	19-Sep-94	Yes	10-Feb-06	MNT, SBA, SBE, SLO
Mammal	GIANT KANGAROO RAT	Dipodomys ingens	Endangered	05-Jan-87	No		SBA, SLO
Mammal	MORRO BAY KANGAROO RAT	Dipodomys heermanni morroensis	Endangered	13-Oct-70	Yes	11-Aug-77	SLO
Mammal	SAN JOAQUIN KIT FOX	Vulpes macrotis	Endangered	11-Mar-67	No		MNT, SBA, SBE,

		mutica					SLO
Mammal	SOUTHERN SEA OTTER	Enhydra lutris nereis	Threatened	14-Jan-77	No		MNT, SBA, SCZ, SLO, VEN
Plant	CALIFORNIA JEWELFLOWER	Caulanthus californicus	Endangered	19-Jul-90	No		SBA, SLO
Plant	CALIFORNIA ORCUTT GRASS	Orcuttia californica	Endangered	03-Aug-93	No		LA, SBA, SLO, VEN
Plant	CALIFORNIA SEABLITE	Suaeda californica	Endangered	15-Dec-94	No		SLO
Plant	CAMATTA CANYON AMOLE	Chlorogalum purpureum var. reductum	Threatened	20-Mar-00	Yes	24-Aug-02	SLO
Plant	CHORRO CREEK BOG THISTLE	Cirsium fontinale var. obispoense	Endangered	15-Dec-94	No		SLO
Plant	GAMBEL'S WATERCRESS	Rorippa gambellii	Endangered	03-Aug-93	No		SBA, SLO
Plant	INDIAN KNOB MOUNTAINBALM	Eriodictyon altissimum	Endangered	15-Dec-94	No		SLO
Plant	LA GRACIOSA THISTLE	Cirsium loncholepis	Endangered	20-Mar-00	Yes	17-Mar-04	SBA, SLO
Plant	MARSH SANDWORT	Arenaria paludicola	Endangered	03-Aug-93	No		SLO
Plant	MORRO MANZANITA	Arctostaphylos morroensis	Threatened	15-Dec-94	No		SLO
Plant	NIPOMO MESA LUPINE	Lupinus nipomensis	Endangered	20-Mar-00	No		SLO
Plant	PARISH'S CHECKERBLOOM	Sidalcea hickmanii ssp. parishii	Candidate	28-Feb-96	No		SBA, SLO
Plant	PISMO CLARKIA	Clarkia speciosa var. immaculata	Endangered	15-Dec-94	No		SLO
Plant	PURPLE AMOLE	Chlorogalum purpureum var. purpureum	Threatened	20-Mar-00	Yes	24-Oct-02	MNT, SLO
Plant	SALT MARSH BIRD'S-BEAK	Cordylanthus maritimus ssp. maritimus	Endangered	28-Sep-78	No		SBA, SLO, VEN
Plant	SAN JOAQUIN WOOLY-THREADS	Lembertia congdonii	Endangered	19-Jul-90	No		MNT, SBA, SBE, SLO
Reptile	BLUNT-NOSED LEOPARD LIZARD	Gambelia silus	Endangered	11-Mar-67	No		LA, SBA, SBD, SBE, SLO, VEN

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Appendix E Plant and Wildlife Species Observed Lists

Plant Species Identified in the Los Osos Valley Road Interchange Study Area

Scientific Name	Common Name
Acanthus mollis	Bear's breech
Agoseris heterophylla	Annual agoseris
Amaranthus sp.	Amaranth
Anagallis arvensis	Scarlet pimpernel
Anaphalis margaritacea	Pearly everlasting
Arctostaphylos sp.	Manzanita
Artemisia douglasiana	Mugwort
Arundo donax	Giant reed
Aster sp.	Aster
Atriplex sp.	Saltweed
Avena barbata	Slender wild oats
Avena fatua	Wild oats
Baccharis pilularis	Coyote brush
Brassica nigra	Black mustard
Brassica rapa	Field mustard
Bromus carinatus	California brome
Bromus diandrus	Ripgut brome
Bromus hordeaceus	Soft chess
Bromus madritensis ssp*. rubens*	Red brome
Capsella bursa-pastoris	Shepherd's purse
Cardaria draba	Hoary cress
Carduus acanthoides	Plumeless thistle
Carduus pycnocephalus	Italian thistle
Carex sp.	Sedge
Centaurea calcitrapa	Purple star-thistle
Centranthus ruber	Jupiter's beard
Cerastium glomeratum	Mouse-ear chickweed
Chamomilla suaveolens	Pineapple weed
Cirsium vulgare	Bull thistle
Conium maculatum	Poison hemlock
Conyza canadensis	Horseweed
Cornus sericea	American dogwood
Cortaderia jubata	Pampas grass
Cynodon dactylon	Bermuda grass
Cyperus eragrostis	Tall flatsedge
Deschampsia danthonioides	Annual hairgrass
Dipsacus fullonum	Teasel
Eleocharis macrostachya	Spikerush
Epilobium ciliatum	Fringed willowherb
Equisetum arvense	Common horsetail
Erodium cicutarium	Redstem filaree
Eschscholzia californica	California poppy
Eucalyptus globulus	Blue gum
Festuca arundinacea	Meadow fescue
Foeniculum vulgare	Sweet fennel
Fumaria parviflora	Fine-leaved fumitory
Geranium dissectum	Geranium
Geranium pusillum	Small-flowered geranium

Scientific Name	Common Name
Hedera helix	English ivy
Helenium puberulum	Sneezeweed
Hesperocnide tenella	Western nettle
Hirschfeldia incana	Perennial mustard
Hoita orbicularis	Creeping leather root
Hordeum brachyantherum	Meadow barley
Hordeum jubatum	Squirreltail barley
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley
Hordeum murinum ssp. *leporinum*	Hare barley
Hypochaeris radicata	Rough cat's ear
Juglans sp.	Walnut
Juncus xiphioides	Iris-leaved rush
Lamarckia aurea	Goldentop
Lamium amplexicaule	Giraffe head
Lepidium latifolium	Broad-leaved pepper-grass
Leymus triticoides	Creeping wild rye
Lolium multiflorum	Italian ryegrass
Lotus corniculatus	Birdfoot trefoil
Lotus scoparius	Deerweed
Lupinus sp.	Lupine
Malva parviflora	Cheeseweed
Marah fabaceus	Manroot
Melilotus albus	White sweetclover
Melilotus indica	Sweetclover
Mentha spicata var. *spicata*	Spearmint
Mimulus guttatus	Seep monkeyflower
Pennisetum clandestinum	Kikuyu grass
Phalaris aquatica	Harding grass
Phoenix sp.	Date palm
Picris echioides	Bristly ox-tongue
Plantago coronopus	Buckhorn plantain
Plantago erecta	California plantain
Plantago lanceolata	English plantain
Platanus racemosa	Western sycamore
Poa annua	Annual bluegrass
Polygonum lapathifolium	Common knotweed
Polypogon interruptus	Ditch polypogon
Polypogon monspeliensis	Rabbitsfoot grass
Populus balsamifera ssp. *trichocarpa*	Black cottonwood
Potentilla anserina ssp. *pacifica*	Coastal silverweed
Quercus agrifolia	Coast live oak
Ranunculus californicus	California buttercup
Raphanus sativus	Wild radish
Rhamnus californica	California coffeeberry
Ricinus communis	Castorbean
Rorippa nasturtium-aquaticum	Watercress
Rubus discolor [*armeniacus*]	Himalayan blackberry
Rubus ursinus	California blackberry
Rumex crispus	Curly dock
Rumex salicifolius	Willow dock

Scientific Name	Common Name
Salix babylonica	Weeping willow
Salix lasiolepis	Arroyo willow
Sambucus mexicana.	Elderberry
Schinus molle	California pepper tree
Scirpus acutus	Tule
Senecio vulgaris	Common groundsel
Silybum marianum	Milk thistle
Solanum nigrum	Black nightshade
Sonchus asper	Prickly sow thistle
Sonchus oleraceus	Common sow thistle
Stachys ajugoides	Hedge nettle
Toxicodendron diversilobum	Poison oak
Tragopogon porrifolius	Salsify
Trifolium hirtum	Rose clover
Trifolium wormskioldii	Cow clover
Tropaeolum majus	Garden nasturtium
Typha angustifolia	Narrow-leaved cattail
Umbellularia californica	California bay
Urtica urens	Dwarf nettle
Verbascum thapsus	Woolly mullein
Veronica anagallis-aquatica	Water speedwell
Veronica catenata	Chain speedwell
Veronica peregrina	Neckweed
Vicia sativa	Vetch
Vinca major	Periwinkle
Xanthium strumarium	Cocklebur

Wildlife Species Identified in the Los Osos Valley Road Interchange Study Area

Scientific Name	Common Name
Invertebrates	
Procambarus clarkii	Crayfish
Amphibians	
Rana catesbeiana	Bullfrog
Hyla regilla	Pacific treefrog
Reptiles	
Thamnophis sirtalis	Common garter snake
Pituophis melanoleucus	Gopher snake
	Southwestern pond turtle
Birds	
Falco tinnunculus	American kestrel
Turdus migratorius	American robin
Tyto alba	Barn owl
Hirundo rustica	Barn swallow
Sayornis saya	Black phoebe
Euphagus cyanocephalus	Brewer's blackbird
Psaltriparus minimus	Bush Tit
Petrochelidon pyrrhonota	Cliff swallow
Corvus corax	Common raven
Sturnus vulgaris	European starling
Ardea alba	Great egret
Bubo virginianus	Great-horned owl
Tringa melanoleuca	Greater yellowlegs
Carpodacus mexicanus	House finch
Charadrius vociferous	Killdeer
Carduelis psaltria	Lesser goldfinch
Anas platyrhynchos	Mallard
Zenaida macroura	Mourning dove
Mimus polyglottos	Northern mockingbird
Podilymbus podiceps	Pied-billed grebe
Buteo lineatus	Red-shouldered hawk
Buteo jamaicensis	Red-tailed hawk
Agelaius phoeniceus	Red-winged blackbird
Oxyura jamaicensis	Ruddy duck
Melospiza melodia	Song sparrow
Cathartes aura	Turkey Vulture
Rallus limicola	Virginia rail
Tyrannus verticalis	Western kingbird
Aphelocoma californica	Western scrub jay
Dendroica coronata	Yellow-rumped warbler
Mammals	
Lepus californicus	Black-tailed hare
Spermophilus beecheyi	California ground squirrel
Canis latrans	Coyote
Procyon lotor	Racoon

Appendix F California Red-Legged Frog Biological Assessment

Los Osos Valley Road/US 101 Interchange Project

Biological Assessment

Los Osos Valley Road/US 101 Interchange

San Luis Obispo County, CA

District 5-MON-101-PM 25.5-26.3

05-OH7300

January 2008

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: Larry Newland, Environmental Planning Branch, 50 Higuera Street, San Luis Obispo, CA 93401, (805) 542-4603 Voice, or use the California Relay Service TTY number, 1-800-735-2922.

Biological Assessment
Los Osos Valley Road/US 101 Interchange
San Luis Obispo County, CA
District 5- SLO-101-41.5 (25.5-26.3)
05-OH7300

January 2008

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration, and
STATE OF CALIFORNIA
Department of Transportation

Prepared By: _____ Date: 2-4-08
LSA Associates, Inc.
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Approved By: _____ Date: 2-4-08
Randy LaVack
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California Department of Transportation, District 5

Summary of Findings, Conclusions and Determinations

The City of San Luis Obispo proposes to improve the Los Osos Valley Road/US 101 Interchange and Los Osos Valley Road (LOVR) in the City and County of San Luis Obispo (City and County, respectively). The California Department of Transportation (Caltrans) will act as the lead state agency due to the fact that the project involves a state highway. The Federal Highway Administration (FHWA) will operate as the lead federal agency.

Operational improvements will consist of the minimum build alternative for this project. This alternative proposes to widen LOVR between the recently constructed Calle Joaquin intersection with LOVR west of US 101 and the Los Verdes community east of US 101 to four lanes, including the existing LOVR overcrossing structure, and San Luis Obispo Creek culvert crossing. The widening will be accomplished by constructing a separate US 101 overcrossing to carry the two eastbound lanes. LOVR will be a split profile over US 101 to accommodate the westbound lanes on the existing overcrossing. The project will lengthen the San Luis Obispo Creek culvert crossing on the south side and construct a cantilevered sidewalk on the north side. These widening efforts will accommodate four 12-foot through-lanes, bike lanes, sidewalks (on both sides), and a median five (5) feet to 16 feet in width, which will be used for left turn pockets where needed. The northbound US 101 off-ramp will be widened from the intersection with LOVR to 500 feet south. The southbound on-ramp will be reconstructed near the current location opposite the southbound off-ramp.

The purpose of this project is to improve traffic operations and safety on LOVR and the LOVR/US 101 interchange incurred as a result of the traffic queues formed by slow-moving vehicles. These traffic queues result in extensive delays, specifically during weekday commute hours and when recreational traffic increases on summer weekends. As additional improvements have been recommended for this section of US 101 by the Transportation Concept Report (2001), the proposed project is to be designed such that it will not preclude the planned ultimate widening of US 101 or any future interchange improvements.

Federally protected species that are known to occur in or near the project area include central California coast steelhead *(Oncorhynchus mykiss irideus)* and California red-

legged frog *(Rana aurora draytonii)* (CRLF). Project impacts related to sensitive species have been detailed in the Natural Environment Study prepared for the project (Jones & Stokes 2007) and will not be addressed here. A separate, focused Biological Assessment has been prepared to discuss project effects on the central California coast steelhead and the following Biological Assessment focuses on CRLF. This project may adversely affect CRLF foraging, summer, and dispersal habitat due to permanent loss of a small amount of riparian habitat and associated construction activities. Critical habitat for CRLF is not present within the proposed project area, thus, the project will not modify any CRLF critical habitat features. Riparian impacts that cannot be mitigated on-site will be mitigated for at a currently undetermined off-site location such as the Johnson Ranch or through the San Luis Obispo Land Conservancy.

Approximate Areas of Disturbance: Alternative 3

Cover Type	**Permanently Affected Hectares (Acres)**	**Temporarily Affected Hectares (Acres)**
Central coast arroyo willow riparian forest	0.16 (0.40)	0.34 (0.84)
Seasonal wetland	0.08 (0.20)	0 (0)
Freshwater marsh	0 (0)	0 (0)
Seasonal drainage	0.02 (0.04)	0 (0)
Perennial drainage	0.03 (0.07)	0.08 (0.19)
Nonnative annual grassland	0.51 (1.26)	0 (0)
Agricultural	0.06 (0.14)	1.97 (4.87)
Ruderal	1.31. (3.24)	0.08 (0.20)
Developed/ landscape	3.77 (9.35)	0.09 (0.23)
Total Affected Area	**5.95 (14.70)**	**2.56 (6.33)**

The proposed project incorporates the avoidance and minimization measures provided within the Programmatic Biological Opinion for Projects Funded or Approved under the Federal Aid Program [HAD-CA, File No.: Section 7 within the Ventura U.S. Fish and Wildlife Service (USFWS), Document 3: S38192] (1-8-02-F-68). The project qualifies for use of the Programmatic Biological Opinion for Projects Funded or Approved under the Federal Aid Program (1-9-02—F-68).

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List of Abbreviated Terms

BA	Biological Assessment
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
CNDDB	California Natural Diversity Database
CRLF	California red-legged frog
dbh	Diameter at breast height (~4 ft)
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
ft	Foot/feet
km	kilometer(s)
KP	kilometer post
LOVR	Los Osos Valley Road
m	meter(s)
mi	Mile(s)
NOAA Fisheries	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OHWM	Ordinary High Water Mark
P.M.	Post mile
SHELL	State Highway Extra Legal Load
SWPPP	Storm Water Pollution Prevention Program
USFWS	U.S. Fish and Wildlife Service

Chapter 1. Introduction

The purpose of this Biological Assessment (BA) is to review the proposed improvements to the Los Osos Valley Road (LOVR)/US 101 interchange in sufficient detail to determine to what extent the proposed project may affect the California red-legged frog *(Rana aurora draytonii)* (CRLF). This BA has been prepared in accordance with legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S. C 1536[c]) and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance.

The proposed project is located on US 101, a heavily traveled four-lane highway serving interstate travel including commuter traffic, recreational traffic, and commercial and agricultural traffic between urban centers in Santa Barbara, San Luis Obispo, and Monterey Counties. The proposed project is located between the Higuera Street and the Madonna Road US 101 off-ramps. Currently, the LOVR/US 101 interchange is diamond-shaped, with the exception of the Calle Joaquin-South southbound on-ramp. Highway traffic at most intersections is currently regulated by stop lights at the northbound on-ramp, the northbound off-ramp, and the southbound off-ramp. To access the southbound on-ramp, drivers must turn onto Calle Joaquin-South and make a left turn onto the US 101 on-ramp. The proposed project is designed to improve traffic safety and reduce traffic delays at all intersections of the interchange.

The objectives of this BA are to (1) evaluate the potential effects of the proposed project on the CRLF, a federally listed (threatened) species and a State-listed species of special concern; (2) determine whether CRLF are likely to be adversely affected by the proposed project; (3) discuss cumulative impacts to CRLF; and (4) discuss measures to mitigate potential adverse effects.

1.1. Project History

The project is located in the City of San Luis Obispo (City), San Luis Obispo County on US 101 at the LOVR interchange (see Figure 1: Project Location Map and Figure 2: Project Vicinity Map). The original US 101 roadway was built in 1933 and was replaced with a larger four-lane highway in 1954. This existing four-lane highway is used primarily for commuter traffic, is considered a Principal Arterial included in the

National Highway System, is a State Highway Extra Legal Load (SHELL) route, and is an oversized truck route. The Transportation Concept Report (2001) recommends that this portion of US 101 be expanded to a six-lane highway; however, widening US 101 is not part of the proposed project.

The LOVR overcrossing (No. 49-0185) was expanded from two lanes to four in 1987. The existing bridge structure is approximately 91.6 meters (m) (300.5 feet[ft]) in length, 16.8 m (55 ft) wide, and consists of 6-m (20-ft) embankments. The southbound US 101 on-ramp is currently accessed from Calle Joaquin-South, and the off-ramp intersects LOVR at the LOVR/Calle Joaquin-South intersection. Southeast and adjacent to the LOVR/US 101 interchange, LOVR passes over San Luis Obispo Creek. The US 101 southbound off-ramp passes over Prefumo Creek just north of LOVR.

1.2. Project Description

The project area extends along LOVR between Auto Park Way to the west, South Higuera Street to the east, and along US 101 for approximately 762 m (2,500 ft) south and 1,500 m (4,300 ft) north of the LOVR overcrossing. The project area covers an approximate distance of 0.84 km (0.52 miles). The project description provides a discussion of the proposed action and a design alternative that was developed to achieve the proposed project purpose and avoid or minimize environmental impacts.

Alternative 3, the minimum build alternative, proposes to widen LOVR between the recently constructed Calle Joaquin intersection with LOVR west of US 101 and the Los Verdes community east of US 101 to four lanes, including the existing LOVR overcrossing structure and San Luis Obispo Creek culvert crossing. The widening will be accomplished by constructing a separate US 101 overcrossing to carry the two eastbound lanes. LOVR will be a split profile over US 101 to accommodate the westbound lanes on the existing overcrossing. The project will lengthen the San Luis Obispo Creek culvert crossing on the south side and construct a cantilevered sidewalk on the north side. These widening efforts will accommodate four 12-foot through-lanes, bike lanes, sidewalks (on both sides), and a median five (5) feet to 16 feet in width, which will be used for left turn pockets where needed. The northbound US 101 off-ramp will be widened from the intersection with LOVR to 500 feet south. The southbound on-ramp will be reconstructed near the current location opposite the southbound off-ramp.

Prefumo Creek under 101: The existing Prefumo Creek Culvert will not be modified. To increase the flood event hydraulic capacity of this channel two 7-foot diameter 165-feet long culverts will be constructed just north of and parallel to the existing culvert. The two new culverts will be placed at an elevation higher than the existing culvert to provide additional capacity during storm events while not diverting flow from the active channel. No modification will be made to the existing culvert. The existing channel will be widened at the culvert inlet and outlet to the north of the existing channel to provide an overflow path into and out of the two new culverts. Slope paving will be implemented at the culvert inlet and rock slope protection will be utilized at the culvert outlet. Rock slope protection (RSP) will be placed outside of the active channel. RSP will be placed 1 foot below final grade, 2.5 feet thick, and to an elevation that matches the top of the 7-foot culverts.

Prefumo Creek under southbound 101 offramp: Culvert extensions have been removed from the project, therefore fish passage analysis will not be produced. The culvert work at the southbound off-ramp on Prefumo Creek will not require extending but will require only headwall construction that is 5 feet taller and 12 feet wider than the current culvert (no length will be added). The existing box culvert will have to be exposed requiring excavation down to the bottom of the streambed. Headwalls will be constructed on the upstream and downstream sides of the culvert. The existing wingwalls will be removed at both locations. Also, 15 feet of channel bank lining upstream will be replaced during this work, either with new lining or with rock slope protection. New channel bank lining or rock slope protection will be placed 15 feet downstream of the culvert. The downstream RSP can be buried in place and revegetated to maintain natural banks.

San Luis Obispo Creek under LOVR: The existing San Luis Obispo Creek Bridge will be widened 30 feet to accommodate two new lanes of traffic. Sediment build up directly below the bridge has decreased the hydraulic capacity of the channel. To restore the original capacity of the structure and to prevent spreading flow, sediment will be removed from the outer two bays to an elevation approximately 3 feet above the bottom of the active channel. The sediment removal will take place approximately 40 feet upstream from the existing bridge and 60 feet downstream from the existing bridge (or 30 feet downstream of the new bridge width). No modification will be made to the active channel with respect to sediment removal.

Flow will be diverted in San Luis Obispo Creek and Prefumo Creek during bridge widening and other in-channel work. Flow will be diverted from June 1 to October 1. Before the flow is diverted, cofferdams will be placed so that flow to river segments downstream from the construction site will not be interrupted.

Additional work that will be performed will:

1. Widen Los Osos Valley Road from two to four lanes from South Higuera Street to 600 feet north of Calle Joaquin to meet the existing four lane Section West of Calle Joaquin.
2. Extend existing San Luis Obispo Creek culvert crossing to accommodate widened LOVR.
3. Construct a separate US 101 overcrossing to carry the two eastbound lanes with a split profile.
4. Raise the intersection of LOVR/US 101 southbound ramps.
5. Construct sidewalks and Class II bike lanes along both sides of LOVR.
6. Construct new street lighting along LOVR.
7. Modify existing signals at LOVR/US 101 ramp intersections.
8. Construct additional box culvert capacity under US 101 for Prefumo Creek.
9. Extend Prefumo Creek box culvert headwall under southbound off-ramp without adding length to existing culvert.
10. Remove deposited material from San Luis Obispo Creek bed under LOVR to restore design hydraulic capacity.
11. Widen/reconstruct US 101 northbound off-ramp and construct retaining wall to avoid creek impacts.
12. Widen US 101 southbound off-ramp and construct retaining walls.
13. Modify storm drain system along LOVR to accommodate widening and profile revisions.
14. Modify landscaping and sidewalks along LOVR at Los Verdes.
15. Modify striping, medians, and lane widths along LOVR at Los Verdes.
16. Restripe on South Higuera Street.

17. Construct retention basin within the northbound loop on-ramp.
18. Construct native landscaping within the intersection.

For further detail regarding Alternative 3, please reference the Natural Environment Study (NES) prepared for the proposed project (Jones & Stokes 2007).

Calle Joaquin was recently realigned and modified as part of the Costco Wholesale Corporation development as a condition of approval and mitigation measure associated with development-induced traffic impacts. However, the proposed project is not interrelated or interdependent on this or any other projects.

Additional Project Features to Avoid and Minimize Impacts

To reduce project-related effects to this species, the following project features will be implemented as described in the Natural Environment Study (Jones & Stokes 2007):

- **Limit In-Channel Construction Activities to the Low-Precipitation Period.** In-channel construction, including riverbank and channel bed construction below the ordinary high-water mark (OHWM), will be limited to the summer low-precipitation period (June 1 to October 15) to reduce the likelihood of adverse effects to breeding or juvenile CRLF.
- **Implement Water Quality Measures.** FHWA will avoid or minimize increased sediment input to the project area channel. As part of the National Pollutant Discharge Elimination System (NPDES) General Construction Activity Storm Water Permit, a Storm Water Pollution Prevention Program (SWPPP) will be implemented that includes the following:
    - Conducting all construction work according to site-specific construction plans that minimize the potential for sediment input to the aquatic system
    - Identifying all areas requiring clearing, grading, revegetation, and recontouring, and minimizing the areas to be cleared, graded, and recontoured
    - Grading spoil sites to minimize surface erosion
    - Avoiding equipment operation in flowing water during in-channel activities by constructing coffer dams and diverting all streamflows through or around construction sites

- Construction sediment catch basins across stream channels immediately below the project site when performing in-channel construction to prevent silt and sediment-laden water from entering the main streamflow (accumulated sediments will be periodically removed from the catch basin)

Increased pollutant input to the project area channel will also be minimized and avoided by:

- Preventing raw cement, concrete or concrete washings, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to aquatic life from contaminating the soil or entering watercourses,
- Establishing a spill prevention and countermeasure plan before project construction that includes strict onsite handling rules to keep construction and maintenance materials out of drainages and waterways,
- Cleaning up all spills immediately according to the spill prevention and countermeasure plan and notifying California Department of Fish and Game (CDFG) and USFWS immediately of any spills and cleanup activities,
- Providing areas located outside the OHWM for staging and storing equipment, materials, fuels, lubricants, solvents, and other possible contaminants,
- Removing vehicles from the normal high-water area of the waterway before refueling and lubricating, and
- Avoiding operation of equipment in flowing water.

- **Avoid Substantial Increases in Water Temperature as a Result of Lost Shade and Disturbance to Streambed and Banks.** The potential for substantial increases in water temperature will be avoided by the following measures:
  - Use exclusionary fencing to minimize the potential for the accidental removal of more vegetation than is necessary to complete construction.
  - Minimize soil compaction by using equipment that can reach over sensitive areas, thereby ensuring suitable soil conditions for revegetation.

- Minimize disturbance to the stream width, depth, velocity, and slope and restore modified or disturbed portions of the stream banks, and riparian areas as nearly as possible to the preproject contours (i.e., elevations, profile, and gradient).
- Minimize extending areas of streambank rock stabilization protection (e.g., sheet piles) and limit the extent of bank and channel armoring to the minimum necessary to protect essential infrastructure in order to reduce gaps in the post construction canopy (i.e., shade).

The proposed project, Alternative 3, would result in the disturbance of approximately 8.51 hectares (21.03 acres) (see Table 1: Approximate Areas of Disturbance: Alternative 3).

The proposed project is tentatively planned for construction in 2010.

Table 1: Approximate Areas of Disturbance: Alternative 3

Plant Community	**Permanently Affected Hectares (Acres)**	**Temporarily Affected Hectares (Acres)**
Central coast arroyo willow riparian forest	0.16 (0.40)	0.34 (0.84)
Seasonal wetland	0.08 (0.20)	0 (0)
Freshwater marsh	0 (0)	0 (0)
Seasonal drainage	0.02 (0.04)	0 (0)
Perennial drainage	0.03 (0.07)	0.08 (0.19)
Nonnative annual grassland	0.51 (1.26)	0 (0)
Agricultural	0.06 (0.14)	1.97 (4.87)
Ruderal	1.31. (3.24)	0.08 (0.20)
Developed/ landscape	3.77 (9.35)	0.09 (0.23)
Total Affected Area	**5.95 (14.70)**	**2.56 (6.33)**

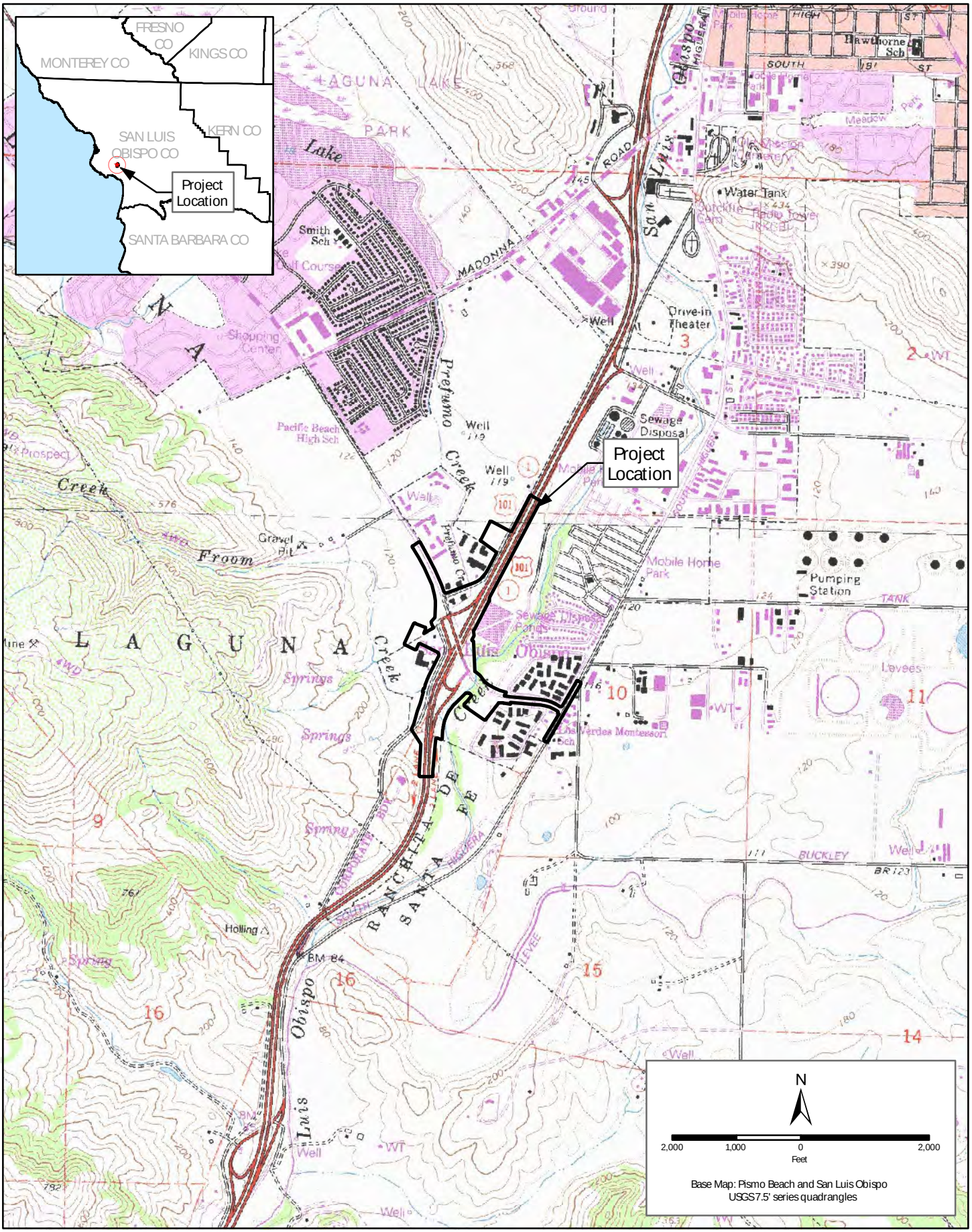

Figure 1
Project Location

Back of Figure 1

Figure 2. Project Vicinity Map

Source: Maptech 1997

Back of Figure 2

1.3. Staging Areas

Staging areas will be accessed through existing roadways and would be confined to the temporary and permanent effect areas. The final location of the staging areas will be delineated within final design plans and prior to the issuance of development permits.

1.4. Summary of Consultation to Date

A field meeting was held on April 4, 2006. Attendees included representatives from the County, Caltrans, Dokken Engineering, and Jones & Stokes. Although the USFWS was not in attendance, a meeting summary was prepared and sent via e-mail by David Hacker of Caltrans, District 5, to Steve Kirkland and Julie Vanderwier of USFWS on April 11, 2006. The USFWS was notified on August 14, 2006 of the positive identification of CRLF during the protocol-level survey effort. Subsequently, a field meeting was held on November 16, 2006 with the City of San Luis Obispo, Caltrans, USFWS, and LSA to review the location of CRLF in relation to this project and the proposed expansion of the Bob Jones Bike Trail.

1.5. Document Preparation History

This document was prepared by biologist Sara Cohn, LSA Associates, Inc. (LSA).

Chapter 2. Study Methods

2.1. Listed and Proposed Species Potentially in the Biological Study Area

This BA is focused on CRLF; therefore, no catalogs of listed and proposed species from the USFWS or National Oceanic and Atmospheric Administration (NOAA) Fisheries were generated. A California Natural Diversity Data Base (CNDDB) records search was conducted to find all documented CRLF occurrences within approximately five miles of the proposed project area. The results of the CRLF report associated with a Biological Assessment prepared for the Calle Joaquin Realignment project (Morro Group 2004) were reviewed. In addition, LSA contacted Brian Stark, of the Land Conservancy of San Luis Obispo, to discuss recent CRLF surveys conducted by the organization within these watersheds. A separate BA for south-central California coast steelhead was prepared by Jones and Stokes. That BA holds the catalogs of listed and proposed species and is included in the NES as Appendix B (Jones and Stokes 2007).

2.2. Studies Required

LSA biologists conducted a site assessment and subsequent protocol-level surveys for CRLF according to the USFWS (2005) guidelines. The site assessment field work was completed on May 30, 2006 and on June 7, 2006. All survey efforts focused on the entire project footprint (project study area) plus a radius of one mile outside the project study area. Areas surveyed for CRLF habitat included reaches of San Luis Obispo, Prefumo, and Froom Creeks as well as the abandoned wastewater treatment facilities east of US 101. Vegetation communities within one mile of the project study area were identified and mapped on an aerial photograph. The surveys included walking around the wastewater treatment facilities, and wading through the reaches of San Luis Obispo, Prefumo, and Froom Creeks within the project study area (see Appendix A: California Red-legged Frog Survey Report.

The San Luis Obispo Creek survey area extended from the Prado Road/US 101 interchange to one mile south of LOVR along South Higuera. The Prefumo Creek survey area extended from Laguna Lake at Madonna Road southeast to the confluence with San Luis Obispo Creek. Froom Creek was surveyed from South Calle Joaquin-South upstream to where it dried, adjacent to the Motel 6. Abandoned wastewater

treatment facilities including two treatment ponds and seven concrete "raceways" were also surveyed.

The USFWS (2005) field survey protocol was followed for every survey effort. Day surveys were conducted between at least one hour after sunrise and one hour before sunset. Night surveys were conducted on mostly clear nights at least one hour after sunset. Ambient temperatures within the creek channels ranged from 55° to 66° Fahrenheit and, although slightly breezy on some nights, the drainage channels were still. Areas that were surveyed for CRLF weekly (seven days apart) included two miles of San Luis Obispo Creek, one mile of Prefumo Creek, the abandoned wastewater treatment facilities, and a portion of Froom Creek as described above. The breeding season surveys occurred between May 30, 2006 and June 29, 2006. Nonbreeding season surveys were conducted on July 26 and 28 and August 3, 8, 9, and 10, 2006. Binoculars and spotlights were used during the nighttime surveys to detect eyeshine of amphibians. Specific survey data is provided in Table 2.

2.3. Personnel and Survey Dates

Field surveys were conducted by LSA biologists Brooke Langle, Sara Cohn, Vicki Trautman, Tim Lacy, Eric Lichtwardt, Rebecca Doubledee, City biologist Freddy Otte, herpetologist Norman Scott, LSA subconsultant, Sage Institute, Inc., biologists Jason Kirschenstein and David Wolff, and Namat Hosseinion of Dokken Engineering.

Table 2: Survey Data

Date	Survey #	Location	CRLF Results	Survey Biologists
30 May 2006	Day 1	Prefumo Creek (lower)	Negative	B. Langle S. Cohn
07 June 2006	Day 1	SLO Creek: Prado to LOVR	Negative	J. Kirschenstein D. Wolff
	Day 1	Froom Creek	Negative	B. Langle F. Otte
	Day 1	Prefumo Creek (upper) and treatment ponds	Negative	B. Langle F. Otte
	Day 1	SLO Creek: LOVR to S. Higuera	Negative	B. Langle F. Otte J. Kirschenstein D. Wolff
	Night 1	Prefumo Creek	Negative	B. Langle F. Otte

Date	Survey #	Location	CRLF Results	Survey Biologists
	Night 1	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
	Night 1	Treatment ponds	Negative	B. Langle
08 June 2006	Night 1	Froom Creek	Negative	B. Langle
	Night 1	SLO Creek: Prado to LOVR	Negative	T. Lacy E. Lichtwardt
14 June 2006	Night 2	Prefumo Creek	Negative	B. Langle S. Cohn
	Night 2	Treatment ponds	Negative	B. Langle
	Night 2	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
15 June 2006	Night 2	Froom Creek	Negative	B. Langle
	Night 2	SLO Creek: Prado to LOVR	Negative	S. Cohn V. Trautman
20 June 2006	Day 2	Treatment ponds	Negative	B. Langle S. Cohn
	Day 2	Prefumo Creek	Negative	B. Langle S. Cohn
	Day 2	Froom Creek	Negative	B. Langle
23 June 2006	Day 2	SLO Creek: Prado to LOVR	Negative	S. Cohn R. Doubledee
	Day 2	SLO Creek: LOVR to S. Higuera	Negative	S. Cohn R. Doubledee
21 June 2006	Night 3	Treatment ponds	Negative	B. Langle
	Night 3	Prefumo Creek	Negative	B. Langle S. Cohn
22 June 2006	Night 3	Froom Creek	Negative	S. Cohn J. Kirschenstein
	Night 3	SLO Creek: Prado to LOVR	Negative	D. Wolff R. Doubledee
	Night 3	SLO Creek: LOVR to S. Higuera	Negative	S. Cohn J. Kirschenstein
28 June 2006	Night 4	Prefumo Creek	Negative	B. Langle N. Scott
29 June 2006	Night 4	Froom Creek	Negative	B. Langle S. Cohn
	Night 4	Treatment ponds	Negative	B. Langle
	Night 4	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
	Night 4	SLO Creek: Prado to LOVR	Negative	B. Langle S. Cohn

Date	Survey #	Location	CRLF Results	Survey Biologists
25 July 2006	Night 1 (non-breeding)	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
26 July 2006	Night 1 (non-breeding)	SLO Creek: Prado to LOVR	Negative	B. Langle N. Hosseinion
	Day 1 (non-breeding):	SLO Creek: Prado to LOVR	Negative	B. Langle N. Hosseinion
28 July 2006	Day 1 (non-breeding)	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
3 August 2006	Day 1 (non-breeding)	Prefumo Creek	Negative	B. Langle S. Cohn
	Day 1 (non-breeding)	Treatment ponds	Negative	S. Cohn
	Day 1 (non-breeding)	Froom Creek	Negative	S. Cohn
	Night 1 (non-breeding)	Prefumo Creek	Negative	B. Langle S. Cohn
	Night 1 (non-breeding)	Froom Creek	Negative	B. Langle S. Cohn
9 August 2006	Night 1 (non-breeding)	Treatment ponds	Positive	B. Langle
10 August 2006	Confirmation survey	Treatment ponds	Positive	B. Langle J. Kirschenstein

2.4. Limitations That May Influence Results

Some areas within the creek were impassable; these areas were surveyed by scanning with binoculars from both upstream and downstream vantages, with some areas surveyed from the top of the bank along Prefumo Creek. One area between the US 101 overcrossing of Prefumo Creek to the confluence with San Luis Obispo Creek contains very deep pools (over 8 feet). These deep pool areas were scanned from upstream and downstream vantages and were also surveyed on occasion by floating through this section.

Chapter 3. Results: Environmental Setting

3.1. Description of Existing Biological and Physical Conditions

Three drainages are within the study area (within a 1-mile radius of the project area): Froom Creek, Prefumo Creek, and San Luis Obispo Creek (see Figure 3a and 3b: Site Photographs). In addition, the City's abandoned wastewater treatment ponds and associated facilities are within the study area. The total study area supports eight vegetation communities as well as agricultural uses and developed/landscaped areas. These vegetation communities include Central Coast arroyo willow riparian forest, seasonal wetland, freshwater marsh, seasonal drainage, perennial drainage, nonnative annual grassland, and ruderal vegetation (see Figure 4: Impacts to Biological Resources Under the Alternative 3). Due to various ongoing disturbances within the vicinity of the drainages including development, landscaping maintenance activities, and agricultural uses, these vegetation types can be described as relatively disturbed. Most of the study area is considered developed or agricultural land. Vegetation classifications have been described according to the vegetation classification and mapping program list of California terrestrial natural communities recognized by the CNDDB (California Department of Fish and Game 2003).

Froom Creek originates southwest of the project area in the Irish Hills. The lower reach of the creek is intermittent, drying in early to late summer. At the time of the site assessment and surveys, only several hundred feet of the channel still held water (measured from Calle Joaquin, then upstream). The study area for this reach began at the remaining upper water edge near the Motel 6 on Calle Joaquin-South. The lower reach was observed from the confluence with San Luis Obispo Creek. The upper reach of Froom Creek has a perennial reach, but this was not within the area surveyed for this project.

Prefumo Creek originates in Prefumo Canyon, southwest of the project area in the Irish Hills. The creek drains into Laguna Lake, then outlets under Madonna Road into a wide freshwater marsh area below the concrete spillway. The study area for this permanent creek began at the outlet under Madonna Road and continued to the confluence with San Luis Obispo Creek.

Photo 1. Looking down Prefumo Creek at the culvert under US-101 south-bound off-ramp.

Photo 2. San Luis Obispo Creek bridge crossing at Los Osos Valley Road.

Photo 3. Upstream San Luis Obispo Creek north of Los Osos Valley Road

Photo 4. Looking downstream San Luis Obispo Creek south of Los Osos Valley Road.

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Figure 3a
Representative Photographs of Prefumo Creek and San Luis Obispo Creek in the Study Area

Backof figure 3a

Photo 1. Seasonal Wetland South of Northbound Highway 101 Onramp.

Photo 2. Seaonal Wetland and Landscaping within Loop of Northbound Highway 101 Onramp.

Photo 3. Looking South at Seasonal Wetland West of Highway 101.

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Figure 3b
Representative Photographs of Seasonal Wetlands in the Study Area

Back of Figure 3b

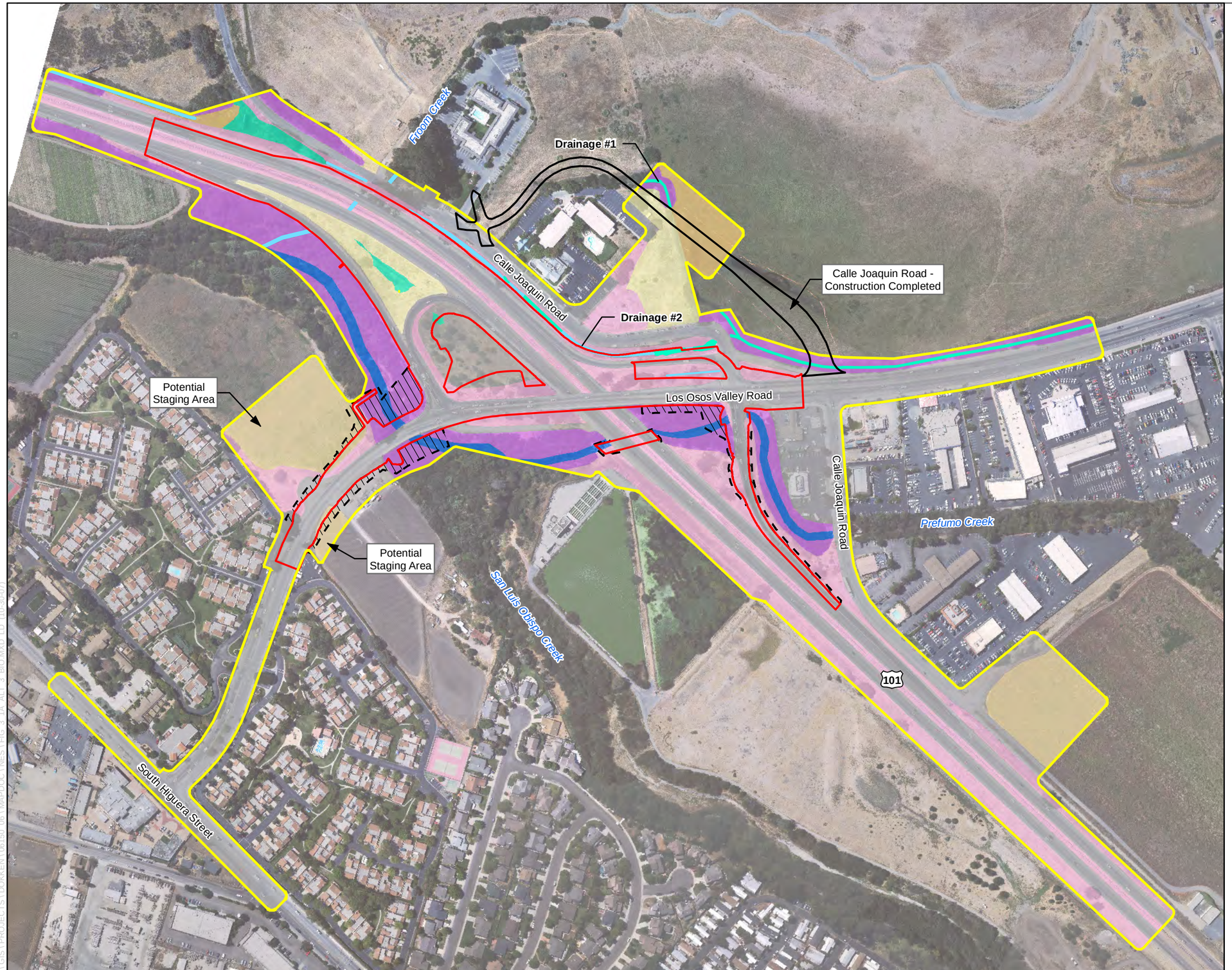

Figure 4
Impacts to Biological Resources Under Alternative 3 (Minimum Build)

Los Osos Valley Road Interchange Project
San Luis Obispo, California

Legend

- Agriculture
- Annual Grassland
- Developed/Landscaped
- Freshwater Marsh
- Perennial Drainage
- Central Coast Arroyo Willow Riparian
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Permanent Impact Area Under Alternative 3 (Minimum Build)
- Limit of Temporary Impact
- Study Area

Aerial Photo Source: City of San Luis Obispo, 2005

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Back of Figure 4

San Luis Obispo Creek originates at the top of Cuesta Pass, generally paralleling US 101, and outlets to the Pacific Ocean at San Luis Bay. The study area began where the creek passes under Prado Road and ended where the creek passes under South Higuera Street, near the northbound Higuera Street on-ramp to the south of the City.

The two abandoned wastewater treatment ponds and associated "raceways" (wastewater facilities) are owned by the City and are located east of US 101 within the project study area. Although the northern pond supports freshwater marsh vegetation, this pond does not contain open water year-round due to compromised berm integrity (Personal communication from Freddy Otte, June 2006). The southern pond contains open water year-round and supports small patches of freshwater marsh plants (*Scirpus* sp. and other emergent vegetation) and willows. Seven abandoned wastewater treatment raceways (approximately 300 feet long) are located directly south of the southern pond. The raceways are concrete and do not support emergent vegetation.

For detailed information regarding Froom Creek, Prefumo Creek, San Luis Obispo Creek, and the wastewater treatment facilities, please refer to the CRLF Survey Report (Appendix A) and the Natural Environment Study (Jones & Stokes 2007).

3.1.1. Habitat/Cover Types

The following discussion describes the 10 vegetation communities or land uses observed within the study area.

3.1.1.1. CENTRAL COAST ARROYO WILLOW RIPARIAN FOREST

The riparian forest communities in the project study area occur along Prefumo Creek and San Luis Obispo Creek west and east of LOVR. One small piece of riparian forest habitat also occurs near the realignment of Calle Joaquin. This community is multilayered, with trees, small trees and shrubs, and herbaceous layers. Dominant tree species in the riparian forest include arroyo willow *(Salix lasiolepis)*, California black walnut *(Juglans californica)*, black cottonwood *(Populus balsamifera ssp. trichocarpa)*, and coast live oak *(Quercus agrifolia)*. Common shrubs include coyote brush *(Baccharis pilularis)*, coffeeberry *(Rhamnus californica)*, California blackberry *(Rubus ursinus)*, and elderberry *(Sambucus mexicana)*. Giant reed *(Arundo donax)*, an invasive species common in riparian forest areas, occurs in isolated clumps. Common herbaceous species in this vegetation community include poison hemlock *(Conium maculatum)*, mugwort *(Artemisia douglasiana)*, and garden nasturtium *(Tropaeolum majus)*.

3.1.1.2. SEASONAL WETLAND

Seasonal wetland communities in the project study area are primarily associated with roadside drainages and basins south of LOVR. Two of the three areas mapped as seasonal wetland in the study area are located near the northbound on-ramp cloverleaf. One of these wetlands is within the northbound on-ramp cloverleaf, and one is in the adjacent area between the northbound off-ramp and highway. These two seasonal wetlands are connected by a culvert under the northbound on-ramp and receive runoff from adjacent roads. The third location is between US 101 and Calle Joaquin-South. Common species in the seasonal wetlands include poison hemlock, Bermuda grass, and curly dock.

3.1.1.3. FRESHWATER MARSH

The project study area supports two locations of freshwater marsh community. One is located within the approved Calle Joaquin realignment project area at the base of the Irish Hills. The other marsh is located between US 101 and Calle Joaquin-South. Dominant species in this community include narrow-leaved cattail *(Typha augustifolia)*, iris-leaved rush *(Juncus xiphioides)*, seep monkeyflower *(Mimulus guttatus)*, and fringed willowherb *(Epilobium ciliatum)*.

3.1.1.4. SEASONAL DRAINAGE

Several seasonal drainages traverse the study area. Some of these drainages are associated with urban runoff, and one is spring-fed. Species occurring within this vegetation community include riparian forest complexes and nonnative species such as ruderal vegetation and pepper trees *(Schinus molle)*.

3.1.1.5. PERENNIAL DRAINAGE

Two perennial drainages cross the project study area, Prefumo Creek and San Luis Obispo Creek. Froom Creek and Prefumo Creek are tributaries to San Luis Obispo Creek. Prefumo Creek drains the northeastern side of the Irish Hills range southwest of the City, and Froom Creek drains the eastern side of the Irish Hills (Tamagni 1995). These drainages cross the project study area roadways via cement box culverts and steel pipe culverts of varying sizes.

3.1.1.6. NONNATIVE ANNUAL GRASSLAND

Nonnative annual grassland is a common community that consists of annual grasses and a variety of native and nonnative annual forbs. It occurs within several areas south of LOVR. Dominant plant species within these areas include wild oat *(Avena fatua)*, soft chess *(Bromus hordeaceus)*, ripgut brome *(Bromus diandrus)*, squirreltail barley *(Hordeum jubatum)*, creeping wildrye *(Leymus tritichoides)*, and Italian ryegrass *(Lolium multiflorum)*. Other characteristic species include scarlet pimpernel *(Anagallis arvensis)*,

mustards *(Brassica* spp.*)*, Italian thistle *(Carduus pycnocephalus)*, willow dock *(Rumex salicifolius)*, and bristly ox-tongue *(Picris echioides)*.

3.1.1.7. AGRICULTURAL

Agricultural lands surround much of the development in the study area on both sides of US 101 and LOVR. Crops include strawberries, wheat, and corn, although most fields were disced or fallow at the time of the surveys. Common species in the fallow fields include saltweed *(Atriplex sp.)*, mustards *(Brassica spp.)*, shepherd's purse *(Capsella bursa-pastoris)*, and pineapple weed *(Matricaria discoidea)*.

3.1.1.8. RUDERAL

Much of the area adjacent to roadsides in the project study area supports ruderal vegetation. This community is similar to the nonnative annual grassland but supports more woody forbs and some nonnative trees. Common species observed in ruderal areas include annual grasses, mustards, Italian thistle, pampas grass *(Cortaderia selloana)*, English ivy *(Hedera sp.)*, English plantain *(Plantago lanceolata)*, wild radish *(Raphanus raphanistrum)*, California plantain *(Plantago erecta)*, and sow thistles *(Sonchus* spp.*)*. Trees in ruderal areas include eucalyptus *(Eucalyptus sp.)*, date palm *(Phoenix dactylifera)*, weeping willow *(Salix babylonica)*, and pepper tree.

3.1.1.9. DEVELOPED/ LANDSCAPE

The areas included as developed/landscaped community include paved or graded areas, buildings, and landscaping surrounding development. Only the landscaped portion is vegetated, and the plants consist primarily of horticultural trees and shrubs, with limited areas of herbaceous flowering plants and turf grass.

For more information about the above-described vegetation communities, please refer to the Natural Environment Study Report (Jones & Stokes 2007).

Chapter 4. Results: Biological Resources, Discussion of Impacts and Minimization

4.1. California Red-legged Frog

The California red-legged frog, federally listed as threatened and a state species of special concern, is known to occur in central coast watersheds from Point Reyes National Seashore south to Baja California. Historically, CRLF occurred within the Sierra Nevada foothills and the Central Valley; however, due to habitat disturbance and exotic predator introduction, CRLF has experienced a 70 percent reduction in its geographic range (Jennings, Bradford, and Johnson 1992). Counties that support the greatest number of occupied drainages include Monterey, San Luis Obispo, and Santa Barbara (USFWS Federal Register 1996).

CRLF require specific habitat characteristics for breeding and upland uses. Breeding habitat is characterized by still to slow-moving water containing emergent vegetation. Breeding occurs following large rain events between the months of November and March. Reddish brown egg masses are laid on emergent vegetation and float at the surface of the water. Upland habitat is necessary for the survival of this species and includes small mammal burrows, leaf litter, downed trees, and dense riparian vegetation. CRLF are generally found in riparian vegetation within 30 meters (approximately 100 feet) of a water source but can move up to 2 miles between aquatic sites to escape drying areas, to forage, or to breed (USFWS Federal Register 1996).

4.1.1. Survey Results

No CRLF were observed in San Luis Obispo, Prefumo, or Froom Creeks. However, two (one juvenile and one adult) CRLF were observed during nighttime, nonbreeding season surveys at the abandoned wastewater facilities during the last night of the survey effort. Numerous bullfrogs, up to 13, were also noted in the treatment plant area at the time of the surveys (see Appendix B: California Red-legged Frog Survey Report). During the surveys, vagrant encampments were observed along San Luis Obispo and Prefumo Creeks. Encampments included tent sites, vegetable plantings, and laundry washing within the creek. Human waste was also observed on occasion within the stream channels. In addition, both creeks contained a large amount of urban debris and trash.

No recent observations or surveys have recorded CRLF in San Luis Obispo Creek or Prefumo Creek within one mile of the project study area (Personal communication, Brian Stark, May 30, 2006, Land Conservancy of San Luis Obispo County). There are no recent or historical records in the CNDDB for CRLF within the Froom Creek watershed, and CRLF were not noted during recent surveys (Morro Group 2004). It should be noted that the upper watershed of Froom Creek was not surveyed as a part of this project nor was it surveyed during the Calle Joaquin Road Realignment Project. One record for foothill yellow-legged frog, *Rana boylii*, exists from the 1988 surveys conducted by V.L. Holland, David Keil, and Michael Hanson for the Froom Ranch Project. It is possible that this occurrence was truly CRLF and was misidentified as *R. boylii*. Little information about the Froom Creek upper watershed is available, thus, amphibian occurrences in this area are unknown.

Despite the lack of historical recorded observations, two individual CRLF were observed during the last survey event in the raceways adjacent to the project area. No egg masses were observed in the wastewater treatment ponds; however, CRLF may use the treatment ponds as breeding habitat. The northern treatment pond contains emergent vegetation and seasonal water and could provide potential breeding habitat. Additionally, the southern treatment pond supports small patches of emergent vegetation that could support CRLF breeding. No CRLF were observed within San Luis Obispo and Prefumo Creeks, and they most likely do not provide suitable breeding habitat due to the presence of many introduced species such as goldfish (*Carassius auratus*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), mosquitofish (*Gambusia affinis*), channel catfish (*Ictalurus punctatus*), brown bullhead (*Ameiurus nebulosus*), golden shiners (*Notemigonus crysoleucas*), and fathead minnows (*Pimephales promelas*) (Tamagni 1995). However, because these drainages carry water through most of the year, they may serve as foraging habitat, summer habitat, or dispersal corridors.

4.1.1.1. CRITICAL HABITAT

The project area is not within designated critical habitat for CRLF. Urban development and fragmented habitat decrease the habitat value of these drainages and the associated upland areas. However, critical habitat designations occur throughout the County north and south of the project vicinity including the Estrella River and Arroyo Grande Creek watersheds.

4.1.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

As well as project design features that avoid or minimize impacts, additional avoidance and minimization measures that are included within the Programmatic Biological Opinion (2003) for this species have been incorporated into the project design and are listed below:

1. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of CRLF.
2. Ground disturbance will not begin until written approval is received from the USFWS that the biologist is qualified to conduct the work.
3. Only USFWS-approved biologists will survey aquatic and riparian areas at the project site 48 hours before the onset of work activities. If any life stage of the CRLF is found and these individuals are likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move them from the site before work activities begin. The USFWS-approved biologist will relocate the CRLF the shortest distance possible, to a location that contains suitable habitat and will not be affected by the activities associated with the proposed project. The USFWS-approved biologist will maintain detailed records of any individuals that are moved (e.g., size, coloration, any distinguishing features, photographs) to assist in determining whether translocated animals are returning to the original point of capture. Any CRLF that require relocation during the project will be placed in the deep pools within Prefumo Creek, upstream of the project area.. A secondary relocation site has been identified on the Johnson Ranch, City-owned property south of the proposed project. A perennial pond with adequate cover exists on the property. However an initial assessment of the pond resulted in the discovery of several juvenile bullfrogs. The City has indicated that they plan to conduct bullfrog and other exotic species eradication in this pond in order to manage for native species, such as CRLF. If the City has successfully conducted this eradication, this pond will be the best relocation area for any CRLF that may be discovered during the implementation of the proposed project. If these efforts have not been conducted, then CRLF will be relocated to the deep pools upstream in Prefumo Creek where no bullfrogs were detected during protocol-level survey efforts (as described above). These locations are shown on Figure 5: Relocation Sites for CRLF.

FIGURE 5

LEGEND

Project Area

Relocation Sites

N

0 1,000 2,000

Feet

SOURCE: Airphoto USA (2003)

Los Osos Valley Road/Route 101 Interchange

Relocation Sites for California Red-legged Frogs

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Back of Figure 5

4. Before any activities begin on the project, a USFWS-approved biologist will conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and its habitat, the specific measures that are being implemented to conserve the CRLF for the current project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided that a qualified person is on hand to answer any questions.
5. A USFWS-approved biologist will be present at the work site until all CRLF are removed, workers have been instructed, and disturbance of habitat is completed. After this time, the state or local sponsoring agency will designate a person to monitor on-site compliance with all minimization measures. The USFWS-approved biologist will ensure that this monitor receives the training outlined in measure 4 and in the identification of CRLF. If the monitor or the approved biologist recommends that work be stopped because CRLF would be affected to a degree that exceeds the levels anticipated by the FHWA and USFWS during review of the proposed action, they will notify the resident engineer (the engineer who is directly overseeing and in command of construction activities) immediately. The resident engineer will either resolve the situation by eliminating the effect immediately or requiring that all action that is causing these effects be halted. If work is stopped, the USFWS will be notified as soon as is reasonably possible.
6. During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
7. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 ft from riparian habitat or water bodies and preferably, not in a location where a spill would drain directly toward aquatic habitat. The monitor will ensure that contamination of habitat does not occur during such operations. Prior to the onset of work, FHWA will ensure that a plan is in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of appropriate measures should a spill occur.
8. Project sites will be revegetated with an assemblage of native riparian, wetland, and upland vegetation suitable for the area. Locally collected plant materials will be used to the extent practicable. Invasive, exotic plants will be controlled to the maximum extent practicable. This measure will be implemented in all areas disturbed by activities associated with the project unless USFWS and FHWA

determine that that it is not feasible or practicable. (For example, an area disturbed by construction that would be used for future activities need not be revegetated.)

9. Habitat contours will be returned to their original configuration at the end of project activities. This measure will be implemented in all areas disturbed by activities associated with the project unless USFWS and FHWA determine that it is not feasible or modification of original contours would benefit the CRLF.
10. The number of access routes, size of staging areas, and total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction and minimize the impact to CRLF habitat; this goal includes locating access routes and construction areas outside of wetlands and riparian areas to the maximum extent practicable.
11. FHWA will attempt to schedule work activities for times of the year when impacts to CRLF would be minimal. For example, work that would affect large pools that may support breeding would be avoided, to the maximum degree practicable, during the breeding season (November through May). Isolated pools that are important to maintain CRLF through the driest portions of the year would be avoided, to the maximum degree practicable, during the late summer and early fall. Habitat assessments, surveys, and informal consultation between FHWA and USFWS during project planning should be used to assist in scheduling work activities to avoid sensitive habitats during key times of the year.
12. To control sedimentation during and after project implementation, FHWA and the sponsoring agency will implement best management practices outlined in any authorizations or permits, issued under the authorities of the Clean Water Act that it receives for the specific project. If best management practices are ineffective, FHWA will attempt to remedy the situation immediately, in consultation with the Service if a work site is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 0.2 inch to prevent CRLF from entering the pump system. Water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. The methods and materials used in any dewatering will be determined by FHWA in consultation with USFWS a on site-specific basis. Upon completion of construction activities, any diversions or barriers to flow will be removed in a manner that would allow the flow to resume with the least disturbance to the substrate. Alteration of the stream bed will be minimized to the maximum extent possible; any imported material will be removed from the stream bed upon completion of the project.

13. Unless approved by USFWS, water will not be impounded in a manner that may attract CRLF.
14. A USFWS-approved biologist will permanently remove any individuals of exotic species such as bullfrogs *(Rana catesbeiana)*, crayfish, and centrarchid fishes from the project area, to the maximum extent possible. The USFWS-approved biologist will be responsible for ensuring that these activities are in compliance with the California Fish and Game Code.
15. To ensure that diseases are not conveyed between work sites by the USFWS-approved biologist, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.

4.1.1.3. PROJECT EFFECTS

The proposed project would not affect any potential CRLF breeding habitat, but may affect potential foraging habitat, summer habitat, and dispersal corridors. Direct effects would include dewatering of aquatic habitat and clearing riparian vegetation, which would result in permanent and temporary loss of potential foraging and summer habitat. If frogs are present at the time of construction, take may result in the form of harassment, injury, and/or mortality. Take may occur as a result of initial vegetation clearing and during dewatering activities, including during relocation of frogs, if necessary. In addition, construction activities including the use of heavy equipment in riparian habitat, dust, noise, and lighting may adversely affect foraging or dispersing CRLF. Although construction in the stream channel would be conducted outside of the rainy season, CRLF using San Luis Obispo or Prefumo Creeks as summer habitat or as dispersal corridors may be adversely affected.

Permanent riparian forest habitat loss would be 0.16 acres, and permanent perennial drainage habitat loss would be 0.03 acres. Riparian and perennial drainage habitat loss would be replaced within the project limit at a minimum ratio of 2:1. Riparian impacts that cannot be mitigated on-site will be mitigated for at a currently undetermined off-site location such as Johnson Ranch or through the San Luis Obispo Land Conservancy. All temporary impacts to riparian and perennial drainage habitat will be mitigated at a minimum ratio of 1:1. Mitigation ratios for the project will be confirmed or adjusted during permitting with CDFG and the Corps.

4.1.1.4. CUMULATIVE EFFECTS (FESA)

Section 7 (Endangered Species Act) regulations require the federal action agency to provide an analysis of cumulative effects when requesting initiation of formal

consultation. Cumulative effects include the effects of future State, tribal, local, or private actions, not involving a federal action, that are reasonably certain to occur in or adjacent to the action area. Future federal actions that are unrelated to the proposed action are not considered in this analysis because they require separate consultation pursuant to Section 7. Federal actions may include granting a permit for a project, authorizing funds for the project, or actually implementing the project.

A short term future project includes a hotel along Calle Joaquin which has City approval and long term planned projects without funding or approval include creek maintenance (consistent with the SLO Creek Watershed Management Plan) and widening of US 101. No future nonfederal projects that would affect CRLF within the action area are known.

Chapter 5. Conclusions and Determination

5.1. Conclusions

Two CRLF were observed within one mile of the project area at the wastewater treatment ponds and associated facilities. Although limited breeding habitat exists within the project area, riparian corridors associated with San Luis Obispo and Prefumo Creeks could provide potential foraging habitat, summer habitat, and dispersal corridors.

5.2. Determination

The proposed project may adversely affect CRLF foraging, summer, or dispersal habitat due to construction activities and grading. Implementation of the above-mentioned minimization and avoidance measures will reduce the likelihood of adverse effects to this species during construction, but the permanent loss of foraging and summer habitat associated with the improvements of the LOVR/US 101interchange are unavoidable. The proposed project is not likely to affect CRLF breeding habitat. No critical habitat for this species exists within the project area. The avoidance and minimization measures would lessen impacts from the project, however project implementation remains likely to adversely affect California red-legged frog.

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Appendix A California Red-Legged Frog Survey Report

CALIFORNIA RED-LEGGED FROG SURVEY REPORT

LOS OSOS VALLEY ROAD/ US-101 INTERCHANGE

SAN LUIS OBISPO, CALIFORNIA

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LSA Project No. DEC0603

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INTRODUCTION

PURPOSE AND SCOPE

LSA Associates, Inc. (LSA) conducted a protocol level survey effort for California red-legged frog (*Rana aurora draytonii*) (CRLF) for the Los Osos Valley Road/US-101 Interchange Project, San Luis Obispo, California (see Figure 1: Vicinity Map). The surveys and report preparation were conducted according to the revised United States Fish and Wildlife Service (USFWS) protocol for this species (USFWS 2005). The project site is situated within the southern section of the U.S. Geological Survey San Luis Obispo 7.5 minute quadrangle (quad) and the northern section of the Pismo quad. This report documents the findings of the eight surveys conducted, including four night and two day surveys during the breeding season and one day and one night survey during the non-breeding season.

PROJECT LOCATION AND DESCRIPTION

The City of San Luis Obispo, the Department of Transportation (Department) and the Federal Highway Administration (FHWA) propose to improve the Los Osos Valley Road/US-101 interchange and Los Osos Valley Road (LOVR) in the City and County of San Luis Obispo through the year 2030. The purpose of the proposed project is to maximize the efficiency of LOVR and the LOVR/US-101 interchange to preempt any degradation of traffic operations within the 20-year design period. The project limits extend along LOVR between Auto Park Way to the west and South Higuera Street to the east and along US-101 for approximately 762 meters (2500 feet) south and 1500 meters (4300 feet) north of the LOVR overcrossing. The proposed project area is approximately 62.5 acres. For the purposes of this report, the project study area is defined as all suitable CRLF habitat within the proposed project footprint and within one mile.

Project Description

The project is located in San Luis Obispo County on US-101 at the LOVR Interchange beginning at Calle Joaquin west of US-101 and terminating at the existing intersection with South Higuera Street south of the Los Verdes housing development. The project covers a distance of 0.84 km (0.52 miles).

US-101. Within the limits of the proposed project, US-101 is a four-lane freeway with 3.6-meter (12-foot) lanes, 2.4-meter (8-foot) right shoulders, and a median width of 12.2 meters (40 feet). The original two-lane roadway was built in 1933 and was replaced with a four-lane facility in 1954. The functional classification of this segment of US-101 is a Principal Arterial and is included in the National Highway System. US-101 is also a SHELL (State Highway Extra Legal Load) route and an oversize truck route. Commute traffic is the primary use through this portion of US-101, but a large percentage of travel through the study area is interregional. The Transportation Concept Report (TCR), produced by the Department and dated 2001, recommends that US-101 be expanded to a six-lane freeway through this segment. However, widening of US-101 is not part of this project.

US-101/LOVR Interchange. The US-101/LOVR interchange is configured as a diamond interchange with the exception that a loop ramp in the southeast quadrant of the interchange provides access from LOVR to northbound US-101. The LOVR overcrossing (No. 49-0185) is a four-span

Source: Maptech 1997

N
W E
S

Not to Scale

Project Vicinity
Figure 1

structure of approximately 91.6 meters (300.5 feet) in length and 16.8 meters (55 feet) in width. Roadway embankments up to 6 meters (20 feet) in height were constructed for the overcrossing. Southeast of the interchange, within the project limit, LOVR passes over San Luis Obispo Creek. The on-ramp to southbound US-101 is accessed from Calle Joaquin-South and not directly from LOVR. The southbound US-101 off-ramp intersects LOVR at the LOVR/Calle Joaquin-South intersection. Calle Joaquin-North intersects LOVR approximately 91 meters (300 feet) to the west of the southbound US-101 off-ramp/Calle Joaquin-South intersection

The purpose of this project is to improve traffic operations and safety on LOVR and the LOVR/US-101 interchange incurred as a result of the traffic queues formed by slow moving vehicles. The acceptable Level of Service for the proposed project is level D. The project is to be designed such that it will not preclude the planned ultimate widening of US-101 or future interchange improvements.

DESCRIPTION OF HABITAT

Three drainages are within the study area (within a one mile radius of the project area): Froom Creek, Prefumo Creek, and San Luis Obispo Creek (see Figure 2: Habitat Communities and Surrounding Uses Within One Mile of the Project Site). In addition, the City of San Luis Obispo (City) wastewater treatment ponds and associated facilities are within the study area. The total study area supports four vegetation communities as well as agricultural uses and developed areas. These vegetation communities include freshwater marsh, annual grassland, riparian, and oak savannah. Due to various ongoing disturbances within the vicinity of the drainages including development, landscaping maintenance activities, and agricultural uses, these vegetation types can be described as relatively disturbed. Most of the study area is developed or agricultural. Vegetation classifications have been described according to *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995).

Froom Creek

Froom Creek originates southwest of the project area in the Irish Hills. The creek is ephemeral, drying in early to late summer. At the time of the site assessment, only several hundred feet of the channel still held water (measured from Calle Joaquin then upstream). By the end of the survey effort, most of the creek had dried, with the exception of a few small, shallow pools (approximately 2 feet in length and 3 inches deep). The study area for this reach began at the remaining upper water edge near the Motel 6 on South Calle Joaquin. The lower reach was observed from the confluence with San Luis Obispo Creek.

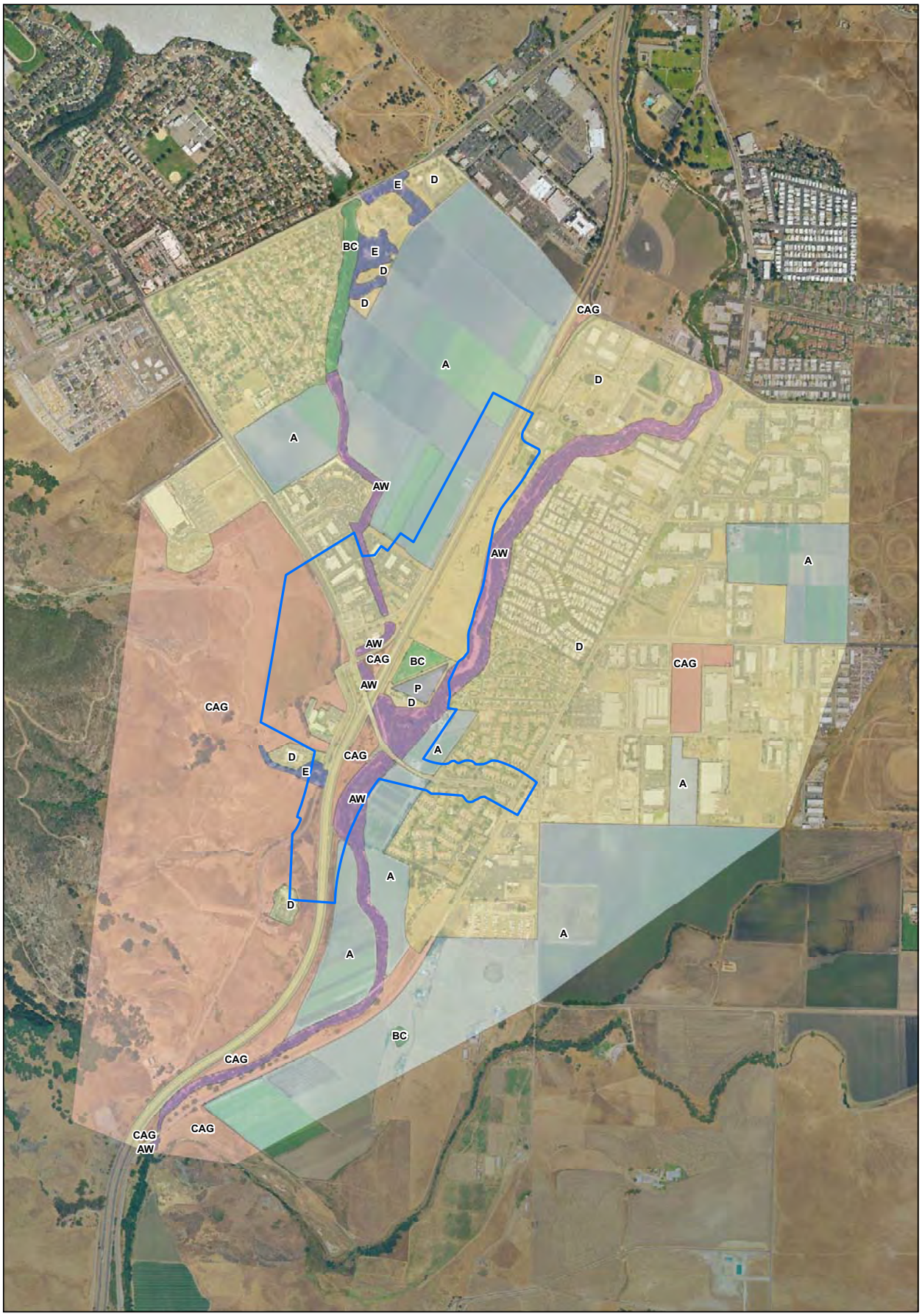
The creek is bordered by the Motel 6 to the north and open space to the south. Large stands of nonnative trees occur on both sides of the bank, with the northern bank supporting ornamental grass maintained by the motel. The creek bottom varies from medium sized cobbles to sand. Water depth at the time of the site assessment varied from 3 to 6 inches, with most areas drying by the end of the survey period. Banks were approximately 6 to 8 feet high.

Prefumo Creek

Prefumo Creek originates in Prefumo Canyon, southwest of the project area in the Irish Hills. The creek drains into Laguna Lake, then outlets under Madonna Road into a wide freshwater marsh area below the concrete spillway. The study area for this permanent creek began at the outlet under Madonna Road and continued to the confluence with San Luis Obispo Creek.

The creek is bordered by residential homes to the south and fallow agricultural fields to the north. The

initial part of this reach has several braided channels of shallow, slow-moving water and is dominated by emergent vegetation. Evidence of sedimentation and urban debris are common for the entire



LEGEND

Project Area

Habitat Type

- Agriculture (A)
- Arroyo Willow (AW)
- Bulrush-Cattail (BC)
- California Annual Grassland (CAG)
- Developed (D)
- Eucalyptus/Ornamental (E)
- Water Treatment Pond (P)

N

0 500 1,000
FEET

SOURCE: Airphoto USA (2003)

FIGURE 2

Los Osos Valley Road/Route 101 Interchange

Habitat Community and Surrounding Uses Within One Mile of the Project Area

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survey area. As the creek moves beyond the residential area to the south, it drops through two concrete impoundments, creating plunge pools before the creek begins to channelize. Additionally, small pools were observed, occurring mostly as secondary channel pools in the upper portion of the reach and numerous mid-channel pools found throughout the remainder of the creek. As the creek narrows, a dense riparian corridor persists and debris dams are found in numerous areas. The vegetation overhangs the creek in several locations. The creek is bordered by fallow agricultural fields in the middle of the reach, with commercial development occurring on either side of the creek in the lower third of the reach. Evidence of homeless encampment was observed in the most southerly portion of this creek.

After the wide flood channel near Madonna Road, the remainder of the reach can be described as a narrow channel with deeply undercut banks and an uneven clay bottom, with occasional pockets of small cobble. The banks rise from 6 feet up to approximately 15 feet. The channel varies in width from 5 feet to 9 feet until it passes under Calle Joaquin, at which point it widens up to 20 feet across. The depth of the creek varied from flat shallow runs at the beginning of the reach, 5-10 inches, up to over 50 inches within the mid-channel pools. The overall average depth was approximately 24 inches at the time of the site assessment. By the end of the survey period, the water had dropped at least 12 inches in most areas and the freshwater marsh area near Madonna Road had dried completely. The slight gradient of this creek creates mostly still and slow-moving water, with the exception of short riffles at the outlet of concrete impoundments, fish ladders, and narrowing of the channel due to debris dams.

A few, dry (at the time of the surveys) drainage channels outlet into the creek at various locations. One location, near the commercial car lots to south, shows evidence of major erosion and sedimentation into the creek. A large network of gabions has been installed at this location.

San Luis Obispo Creek

San Luis Obispo Creek originates at the top of Cuesta Pass, generally paralleling US-101, and outlets to the Pacific Ocean in Avila Beach. The study area began where the creek passes under Prado Road, and ended where the creek passes under South Higuera Street, near the northbound Higuera Street on-ramp to the south of the City.

This reach of San Luis Obispo Creek is largely bordered by residential and commercial development until it passes under LOVR. At this point, the creek is bordered by a strip of land between US-101 and the creek to the west and fallow agricultural fields to the east. Evidence of urban debris was found throughout the creek, including large debris deposits as high as 11 feet.

The substrate consists of medium to small cobbles, with numerous pools of varying origin (plunge pools, mid-channel pools, step pools, channel confluence pools, corner pools, lateral scour pools, secondary channel pools, and backwater pools). Pool depths varied from several inches to over 55 inches. The gradient of the stream is low to moderate with water continuously flowing through a variety of stream types including riffles, runs, glides, and areas of deep, somewhat still, pools. The Prado to LOVR reach was observed during the survey to be mostly shallow riffle type habitat less than 3 feet deep. The wastewater treatment plant contributes chlorine treated flows and the Prefumo Creek confluence had a relatively large pool area greater than 5 feet deep. The LOVR to Higuera Street bridge reach was observed to support all the pool types listed above and had varying depths with several deeper areas (greater than 4 feet deep) created at locations of scouring flows.

The vegetation varies from a partially open canopy to dense stands of riparian trees that overhang the water. The riparian habitat is dominated by arroyo willow with cottonwood *(Populus fremontii)*, sycamore *(Platanus racemosa)*, and walnut trees *(Juglans californica)* scattered throughout the riparian habitat. There is very little streamside emergent vegetation present throughout the study area where flows are slow enough to accommodate growth. Several areas of dense giant reed (*Arundo donax*) occur along the creek banks. The top of bank areas support dense stands ruderal vegetation composed primarily of hemlock, mustard, and thistles.

Abandoned Wastewater Treatment Ponds

Two abandoned wastewater treatment ponds and associated "raceways" (wastewater facilities) owned by the City are located east of US-101 within the project study area. Although the northern pond supports freshwater marsh vegetation, this pond does not contain open water year-round due to small mammal burrows and compromised berm integrity (City. Otte, Freddy. June 2006. Personal communication). The southern pond contains open water year-round at an average depth of 12 inches and supports small patches of freshwater marsh plants and willows.

Prior to the site assessment and survey events, the northern pond was drained by the City in accordance with maintenance activities and was almost entirely dry at the time of survey. Seven abandoned wastewater treatment raceways (approximately 300 feet long) are located directly south of the southern pond. The raceways are concrete and do not support emergent vegetation.

Bulrush-Cattail Series

The seasonal freshwater marshes that include bulrush and cattail are dominated by a mixture of cattails *(Typha latifolia)*, tule *(Scirpus acutus)*, sedges *(Carex* sp. and *Cyperus* sp.*)* rushes (*Juncus spp.*), and herbaceous dicots *(Cirsium vulgare* and *Rumex salicifolius)*. These communities are associated with floodplain areas within the project boundary, along drainages, near freshwater seeps and springs, and in the northern abandoned treatment pond. Water smartweed *(Polygonum amphibium* var. *emersum)* is present within this community in Prefumo Creek and the wastewater treatment ponds. Salt grass *(Distichlis spicata)* is also present at the wastewater treatment ponds.

California Annual Grassland Series

Species associated with annual grassland communities, including ripgut brome *(Bromus diandrus)*, mustards *(Brassica* sp.*)*, and wild oat *(Avena fatua)*, are noted along LOVR, US-101, and southwest of the project area. This community is also present east of the abandoned wastewater treatment plant. This area experiences regular disturbances, including mowing and landscaping. Other species noted within these areas include soft chess *(Bromus hordeaceus)*, California poppy *(Eschscholzia californica)*, and rattail fescue *(Vulpia myuros)*. Scattered cypress *(Cupressus* sp.*)* and pine *(Pinus* sp.*)* trees have been planted east of US-101 near the wastewater treatment plant.

Arroyo Willow Series

This vegetation community exists throughout the project area along Froom Creek, Prefumo Creek, San Luis Obispo Creek, and in scattered pockets at the wastewater treatment ponds. This riparian series is dominated by large, continuous stands of arroyo willow *(Salix lasiolepis)*, with coyote brush *(Baccharis pilularis*) occurring as a near co-dominant. Mulefat *(Baccharis salicifolia)* stands are commonly intermixed with the willows on the banks of Prefumo and San Luis Obispo Creeks. Willows are also noted in a few areas along the perimeter of the abandoned treatment ponds. The

understory consists of California blackberry *(Rubus ursinus)*, which is found on a majority of the stream banks of Prefumo and San Luis Obispo Creeks. Other native species include poison oak *(Toxicodendron diversilobum)*, coffeeberry *(Rhamnus californica)*, and black sage *(Salvia mellifera)*. Many nonnative herbaceous species are dispersed within this community, including sweet fennel *(Foeniculum vulgare)*, Italian thistle *(Carduus pycnocephalus)*, honeysuckle (*Lonicera japonica*) and poison hemlock *(Conium maculatum)*.

California Annual Grassland - Coast Live Oak Series

This habitat complex is predominately characterized by annual grassland species such as ripgut brome, mustards, and wild oat. Scattered pockets of coast live oak trees *(Quercus agrifolia*) exist west of US-101 and along road sides. In addition to a coast live oak overstory, this community includes California sagebrush *(Artemisia californica)*, black sage, poison oak, and other sage scrub species. Oaks and scrub are noted west of US-101 and south of LOVR.

Agriculture

Several areas surrounding the proposed project and survey area are active or fallow agricultural fields, characterized by crops, ruderal forbs, and nonnative grasses.

Developed

Developed areas are those that do not support plant life, are paved, graded, or developed. Several areas in and around the project area support commercial development.

California Red-Legged Frog Habitat

The project site and surrounding area is within the geographic range of the CRLF (Stebbins 2003, USFWS 2005). Jennings and Hayes (1994) documented numerous records for this taxon in southern San Luis Obispo County and a search of the CNDDB indicates that there are records of the CRLF from within five miles of the project site. No recent observations or surveys have recorded CRLF in San Luis Obispo Creek or Prefumo Creek within the study area (Land Conservancy of San Luis Obispo County, Stark, Brian. May 30, 2006. Personal communication). There are no recent or historical records in the CNDDB for CRLF within the Froom Creek watershed and CRLF were not noted during recent surveys unrelated to this project (Morro Group 2004).

SURVEY METHODOLOGY

A California Natural Diversity Data Base (CNDDB) records search was conducted to find all CRLF occurrences within approximately one mile of the proposed project study area. LSA also reviewed the results of the CRLF report associated with a Biological Assessment prepared for the Calle Joaquin Realignment Project (Morro Group 2004). In addition, LSA contacted Brian Stark, of the Land Conservancy of San Luis Obispo, to discuss recent CRLF surveys conducted by the organization within these watersheds.

LSA biologists conducted a site assessment and subsequent protocol level surveys for CRLF according to the USFWS (2005) guidelines. The site assessment field work was completed on 30 May 2006 and on 7 June 2006. The effort focused on the entire project footprint plus a radius of one mile outside of the project footprint. Areas surveyed for CRLF habitat included reaches of San Luis Obispo, Prefumo, and Froom Creeks as well as the abandoned wastewater treatment facilities east of US-101. Field surveys were conducted by LSA biologists Brooke Langle, Sara Cohn, Vicki Trautman, Tim Lacy, Eric Lichtwardt, Rebecca Doubledee, City biologist Freddy Otte, herpetologist Norman Scott, and LSA subconsultant, Sage Institute, Inc., biologists Jason Kirschenstein and David Wolff. Qualifications for these biologists are included in Appendix D. Habitat types within one mile of the project study area were identified and mapped on an aerial photograph. The surveys included walking around the wastewater treatment facilities, and wading through the reaches of San Luis Obispo, Prefumo, and Froom Creeks one mile outside of the project study area (See Appendix A – California Red-legged Frog Site Assessment). Some areas within the creek were impassable; these areas were surveyed by scanning with binoculars from both upstream and downstream vantages, with some areas surveyed from the top of the bank along Prefumo Creek. One area between the US-101 overcrossing of Prefumo Creek to the confluence with San Luis Obispo Creek contains very deep pools (over 8 feet). Theses deep pool areas were scanned from upstream and downstream vantages and were also surveyed on occasion by floating through this section. The San Luis Obispo Creek survey area extended from the Prado Road/US-101 interchange to LOVR and one mile south of LOVR along South Higuera. The Prefumo Creek survey area extended from Laguna Lake at Madonna Road southeast to the confluence with San Luis Obispo Creek. Froom Creek was surveyed from South Calle Joaquin to where it dried, adjacent to the Motel 6. Photographs of the project study site are presented in Appendix B.

The USFWS (2005) field survey protocol was followed for every survey effort. Day surveys were conducted between at least one hour after sunrise and one hour before sunset. Night surveys were conducted on mostly clear nights at least one hour after sunset. Ambient temperatures within the creek channels ranged from 55° to 66° Fahrenheit and, although slightly breezy on some nights, the drainage channels were still. Areas that were surveyed for CRLF weekly (seven days apart) included two miles of San Luis Obispo Creek, one mile of Prefumo Creek, the abandoned wastewater treatment facilities, and a portion of Froom Creek as described above. The breeding season surveys occurred between 30 May 2006 and 29 June 2006. Non-breeding season surveys were conducted on 26 and 28 July and 3, 8, 9, and 10 August 2006. Binoculars and spotlights were used during the nighttime surveys to detect eyeshine of amphibians.

SURVEY RESULTS

No CRLF were observed in San Luis Obispo, Prefumo, or Froom Creeks. However, two CRLFs, one juvenile and one adult, were observed during nighttime, non-breeding season surveys at the abandoned wastewater facilities during the last night of the survey effort. Numerous bullfrogs, up to 13, were also noted in the treatment plant area at the time of the surveys (see Figure 3: Location of California Red-legged Frog Sighting and Appendix B). Survey results are summarized in Table A below. During the surveys, vagrant encampments were observed along San Luis Obispo and Prefumo Creeks. Encampments included tent sites, vegetable plantings, and laundry washing within the creek. Human waste was also observed on occasion within the stream channels. In addition, both creeks contained a large amount of urban debris and trash. Data sheets for each survey event are provided in Appendix C.

Table A: Field Survey Summary

Date	Survey #	Location	CRLF Results	Survey Biologists
30 May 2006	Day 1	Prefumo Creek (lower)	Negative	B. Langle S. Cohn
07 June 2006	Day 1	SLO Creek: Prado to LOVR	Negative	J. Kirschenstein D. Wolff
	Day 1	Froom Creek	Negative	B. Langle F. Otte
	Day 1	Prefumo Creek (upper) and treatment ponds	Negative	B. Langle F. Otte
	Day 1	SLO Creek: LOVR to S. Higuera	Negative	B. Langle F. Otte J. Kirschenstein D. Wolff
	Night 1	Prefumo Creek	Negative	B. Langle F. Otte
	Night 1	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
	Night 1	Treatment ponds	Negative	B. Langle
08 June 2006	Night 1	Froom Creek	Negative	B. Langle
	Night 1	SLO Creek: Prado to LOVR	Negative	T. Lacy E. Lichtwardt
14 June 2006	Night 2	Prefumo Creek	Negative	B. Langle S. Cohn
	Night 2	Treatment ponds	Negative	B. Langle

Date	Survey #	Location	CRLF Results	Survey Biologists
	Night 2	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
15 June 2006	Night 2	Froom Creek	Negative	B. Langle
	Night 2	SLO Creek: Prado to LOVR	Negative	S. Cohn V. Trautman
20 June 2006	Day 2	Treatment ponds	Negative	B. Langle S. Cohn
	Day 2	Prefumo Creek	Negative	B. Langle S. Cohn
	Day 2	Froom Creek	Negative	B. Langle
23 June 2006	Day 2	SLO Creek: Prado to LOVR	Negative	S. Cohn R. Doubledee
	Day 2	SLO Creek: LOVR to S. Higuera	Negative	S. Cohn R. Doubledee
21 June 2006	Night 3	Treatment ponds	Negative	B. Langle
	Night 3	Prefumo Creek	Negative	B. Langle S. Cohn
22 June 2006	Night 3	Froom Creek	Negative	S. Cohn J. Kirschenstein
	Night 3	SLO Creek: Prado to LOVR	Negative	D. Wolff R. Doubledee
	Night 3	SLO Creek: LOVR to S. Higuera	Negative	S. Cohn J. Kirschenstein
28 June 2006	Night 4	Prefumo Creek	Negative	B. Langle N. Scott
29 June 2006	Night 4	Froom Creek	Negative	B. Langle S. Cohn
	Night 4	Treatment ponds	Negative	B. Langle
	Night 4	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
	Night 4	SLO Creek: Prado to LOVR	Negative	B. Langle S. Cohn
25 July 2006	Night 1 (non-breeding)	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
26 July 2006	Night 1 (non-breeding)	SLO Creek: Prado to LOVR	Negative	B. Langle N. Hosseinion
	Day 1 (non-breeding):	SLO Creek: Prado to LOVR	Negative	B. Langle N. Hosseinion
28 July 2006	Day 1 (non-breeding)	SLO Creek: LOVR to S. Higuera	Negative	J. Kirschenstein D. Wolff
3 August 2006	Day 1 (non-breeding)	Prefumo Creek	Negative	B. Langle S. Cohn

Date	Survey #	Location	CRLF Results	Survey Biologists
	Day 1 (non-breeding)	Treatment ponds	Negative	S. Cohn
	Day 1 (non-breeding)	Froom Creek	Negative	S. Cohn
	Night 1 (non-breeding)	Prefumo Creek	Negative	B. Langle S. Cohn
	Night 1 (non-breeding)	Froom Creek	Negative	B. Langle S. Cohn
9 August 2006	Night 1 (non-breeding)	Treatment ponds	Positive	B. Langle
10 August 2006	Confirmation survey	Treatment ponds	Positive	B. Langle J. Kirschenstein

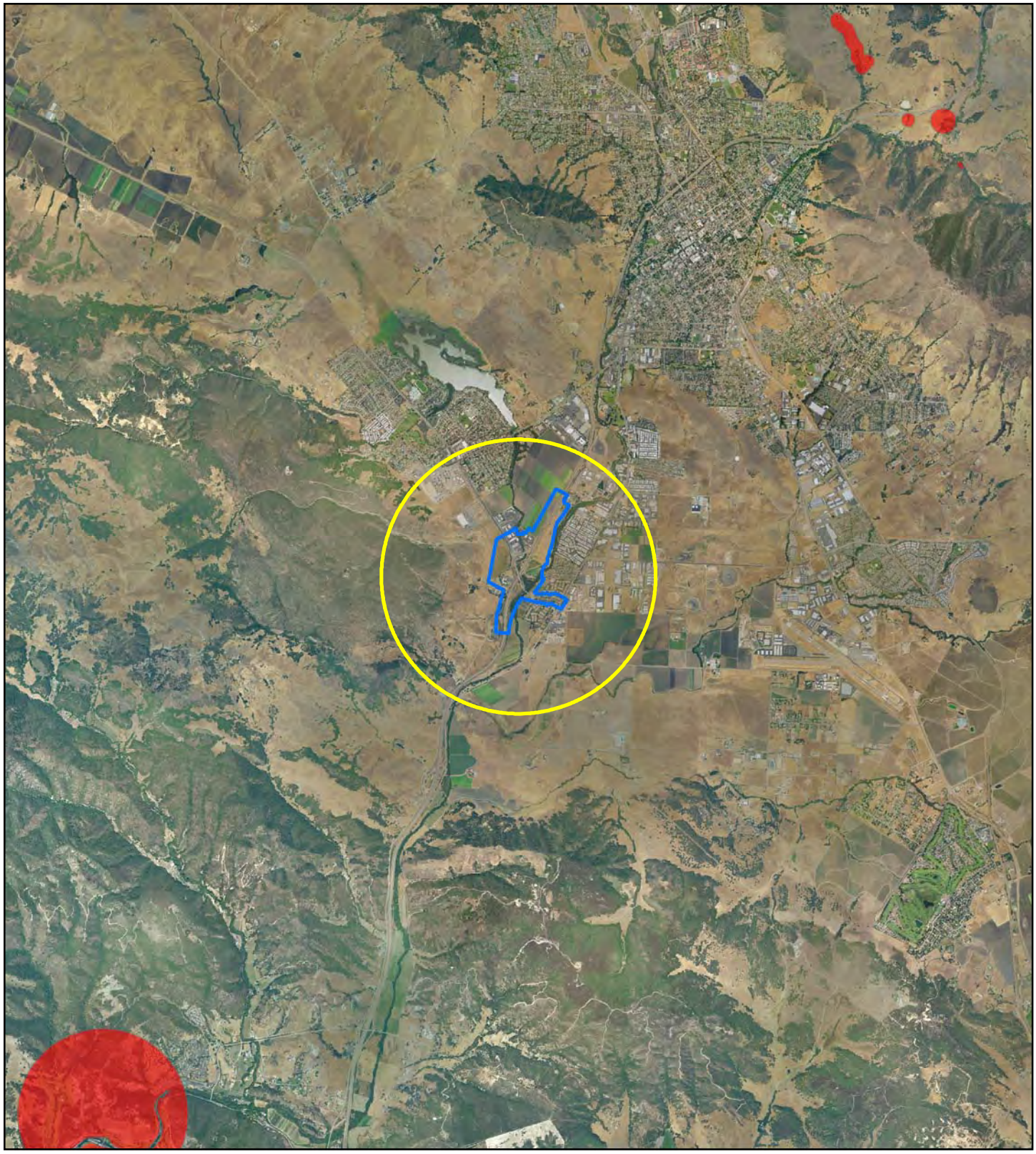

FIGURE 3

LEGEND

Project Area

One Mile Buffer

Red-Legged Frog Sightings (CNDDB)

0 0.5 1

Miles

Los Osos Valley Road/Route 101 Interchange

California Red-Legged Frog Sightings

California Natural Diversity Database

SOURCE: Airphoto USA (2003)

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CONCLUSIONS

DISCUSSION OF CALIFORNIA RED-LEGGED FROG RESULTS

California red-legged frogs were observed within the abandoned wastewater treatment plant facilities. These individuals may be dispersing from existing habitat within the treatment facilities. There is suitable breeding habitat in the northern pond during the rainy season; however, very little standing water was observed during the site assessment and within the first week of surveys. The adjacent southern wastewater treatment pond is mainly open water and is managed to primarily provide habitat for waterfowl, although southwestern pond turtles and bullfrogs were also observed. Bullfrogs prey on CRLF and may threaten the survival of the individuals observed.

Three main factors may contribute to the lack of CRLF observations in San Luis Obispo, Prefumo, and Froom Creeks. These factors include the habitat alterations caused by channelized banks and periods of high flow, high invasive predator populations, and pollution from nearby land uses. In the study area, Prefumo Creek and San Luis Obispo Creek are surrounded by developed or agricultural areas. As a result, these two creeks are channelized and are not protected from high flows and fast water during the rainy season. On average in San Luis Obispo, the most precipitation occurs between January and March of each year (www.weatherchannel.com). Therefore, during the CRLF breeding season (February – April) these drainages are often at their yearly maximum flows. According to observed debris lines, these creeks experience high flows of up to 11 feet and do not provide ponded areas suitable for CRLF egg deposits.

San Luis Obispo, Prefumo, and Froom Creeks, as well as the wastewater treatment area, support bullfrog *(Rana catesbeiana)* and crayfish *(Orconectes rusticus)* populations. A few large bullfrogs and two southwestern pond turtles were observed in the southern pond during the surveys. The City has indicated that the water level of this pond is typically maintained at 12 inches (City. Otte, Freddy. June 2006. Personal communication). Hundreds of crayfish, numerous bullfrogs, and carp were observed within Prefumo and San Luis Obispo Creeks during the surveys. These species prey on native amphibians such as CRLF and, coupled with habitat alterations, may promote the decline of CRLF in aquatic ecosystems (Lawler, Dritz, Strange, and Holyoak 1999; Keisecker, Chivers, Anderson, and Blaustein 2002; Moyle 1973). In addition, numerous adult bullfrogs were observed in the concrete raceways near the treatment ponds. Hundreds of pacific treefrogs *(Pseudacris regilla)* were heard throughout the project area.

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APPENDIX A: CALIFORNIA RED-LEGGED FROG SITE ASSESSMENT

CALIFORNIA RED-LEGGED FROG SITE ASSESSMENT

LOS OSOS VALLEY ROAD/US-101 INTERCHANGE

SAN LUIS OBISPO, CALIFORNIA

Submitted to:

Dokken Engineering
2365 Iron Point Road
Folsom, California 95630
(916) 858-0642

Prepared for:

City of San Luis Obispo
955 Morro Street
San Luis Obispo, California 93401
Contact: Timothy Scott Bochum,
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805/781-7203

July 2006

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INTRODUCTION

LSA Associates, Inc. (LSA) conducted a site assessment for California red-legged frog (*Rana aurora draytonii*) (CRLF) for the Los Osos Valley Road/US-101 Interchange Project, San Luis Obispo, California (see Figure 1: Vicinity Map). The site assessment was conducted according to the revised United States Fish and Wildlife Service (USFWS) protocol for this species (USFWS 2005). The project site is situated within the southern section of the U.S. Geological Survey San Luis Obispo 7.5 minute quadrangle (quad) and the northern section of the Pismo quad. This report documents the findings of the site assessment.

The City of San Luis Obispo, the Department of Transportation, and the Federal Highway Administration propose to improve the Los Osos Valley Road/US-101 Interchange and Los Osos Valley Road (LOVR) in the City and County of San Luis Obispo (City and County, respectively) through the year 2030. The purpose of the proposed project is to maximize the efficiency of LOVR and the LOVR/US-101 Interchange. The project is located in San Luis Obispo County on US-101 at the LOVR Interchange beginning at Calle Joaquin west of US-101 and terminating at the existing intersection with South Higuera Street, south of the Los Verdes housing development. The proposed project area is approximately 62.5 acres. For the purposes of this report, the project study area is defined as all suitable CRLF habitat within the proposed project footprint and within one mile.

METHODS

LSA biologists conducted a site assessment for CRLF within the proposed project study area on 30 May 2006 (1400–1830 hours) and on 7 June 2006 (1300–1900 hours). The site assessment focused on the entire project footprint plus a radius of one mile outside of the project footprint. Areas surveyed for CRLF habitat included reaches of San Luis Obispo, Prefumo, and Froom Creeks as well as the abandoned wastewater treatment ponds and facilities east of US-101.

Field surveys were conducted by LSA biologists Brooke Langle and Sara Cohn, City biologist Freddy Otte, and LSA subconsultant, Sage Institute, Inc., biologists David Wolff and Jason Kirschenstein. Habitat types within one mile of the project study area were identified and mapped on an aerial photograph by LSA. The fieldwork included foot and road surveys, walking around the wastewater treatment ponds and facilities, and reaches of San Luis Obispo, Prefumo, and Froom Creeks one mile outside of the project study area.

A California Natural Diversity Data Base (CNDDB) records search was conducted to find all known CRLF occurrences within approximately one mile of the proposed project study area (see Figure 2: California Red-legged Frog Sightings Within One Mile of Project Area). LSA also reviewed the results of the CRLF report associated with a Biological Assessment prepared for the Calle Joaquin Realignment Project (Morro Group 2004). In addition, LSA contacted Brian Stark, of the Land Conservancy of San Luis Obispo, to discuss recent CRLF surveys conducted by the organization within these watersheds.

Source: Compass Maps

NORTH
Not to Scale

VICINITY MAP
FIGURE 1

FINDINGS

The project site is within the geographic range of the CRLF (Stebbins 2003, USFWS 2005). Jennings and Hayes (1994) documented numerous records for this taxon in southern San Luis Obispo County and a search of the CNDDB indicates that there are records of the CRLF from within five miles of the project site.

California Red-legged Frog Records

There are four records of CRLF within approximately five miles of the interchange area (see Figure 2: California Red-legged Frog Sightings Within One Mile of Project Area). Two of the recorded observations are from tributaries to San Luis Obispo Creek approximately two miles north of the City of San Luis Obispo (three miles from the project area). San Luis Obispo Creek flows southwest through the City of San Luis Obispo and associated residential developments and into the project study area. Although portions of the creek have retained natural riparian characteristics, surrounding land uses have reduced riparian habitat, caused course and stream channelization, and introduced nonnative species. Two of the recorded observations are from the Reservoir Canyon area near San Luis Obispo Creek approximately five miles north of the project area.

No recent observations or surveys have recorded CRLF in San Luis Obispo Creek or Prefumo Creek within one mile of the project study area (Land Conservancy of San Luis Obispo County, Stark, Brian. May 30, 2006. Personal communication). There are no recent or historical records in the CNDDB for CRLF within the Froom Creek watershed and CRLF were not noted during recent surveys (Morro Group 2004).

Habitat Types and Land Uses

The habitat types and land uses that are present within the boundaries of the project site are mapped and described below (see Figure 3: Habitat Communities and Surrounding Uses Within One Mile of the Project Site). Habitat communities and descriptions were classified and standardized using *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Representative photographs of the survey area are provided in Appendix A.

Habitat Types and Land Uses Within the Project Area

The total project area supports four vegetation communities as well as agricultural uses and developed areas. Due to various ongoing disturbances within the project area including development, landscaping maintenance activities, and agriculture, these habitat types can be distinguished as relatively disturbed. Most of the project area is considered to be developed or agricultural lands. Data sheets per USFWS protocol requirements are provided in Appendix B.

Froom Creek

Froom Creek originates southwest of the project area in the Irish Hills. The creek is ephemeral, drying in early to late summer. At the time of the site assessment, only several hundred feet of the channel still held water (measured from Calle Joaquin then upstream). The study area for this reach began at the remaining upper water edge near the Motel 6 on South Calle Joaquin. The lower reach was observed from the confluence with San Luis Obispo Creek.

The creek is bordered by the Motel 6 to the north and open space to the south. Large stands of nonnative trees occur on both sides of the bank, with the northern bank supporting ornamental grass

maintained by the motel. The creek bottom varies from medium sized cobbles to sand. Water depth at the time of the site assessment varied from 3 to 6 inches. A few shallow mid-channel pools were present, but appeared to be quickly drying. Banks were approximately 6 to 8 feet high.

Prefumo Creek

Prefumo Creek originates in Prefumo Canyon, southwest of the project area in the Irish Hills. The creek drains into Laguna Lake, then outlets under Madonna Road into a wide freshwater marsh area below the concrete spillway. The study area for this permanent creek began at the outlet under Madonna Road and continued to the confluence with San Luis Obispo Creek.

The creek is bordered by residential homes to the south and fallow agricultural fields to the north. The initial part of this reach has several braided channels of shallow, slow-moving water and is dominated by vegetation. Evidence of sedimentation and urban debris are common for the first quarter of the survey area. As the creek moves beyond the residential area to the south, it drops through two concrete impoundments, creating plunge pools before the creek begins to channelize. Additionally, small pools were observed, mostly secondary channel pools in the upper portion of the reach and numerous mid-channel pools were found throughout the creek. As the creek narrows, a dense riparian corridor persists and debris dams are found in numerous areas. The vegetation overhangs the creek in several locations. The creek is bordered by fallow agricultural fields in the middle of the reach, with commercial development occurring on either side of the creek in the lower third of the reach. Evidence of vagrant encampments were observed in the southerly portion of this creek.

After the wide flood channel near Madonna Road, the remainder of the reach can be described as a narrow channel with deeply undercut banks and an uneven clay bottom, with occasional pockets of small cobble. The banks rise from 6 feet up to approximately 15 feet. The channel varies in width from 5 feet to 9 feet until it passes under Calle Joaquin, at which point it widens to 20 feet across. The depth of the creek varied from flat shallow runs at the beginning of the reach, 5-10 inches, up to over 50 inches within the mid-channel pools. The overall average depth was approximately 24 inches at the time of the site assessment. The slight gradient of this creek creates mostly still and slow-moving water, with the exception of short riffles at the outlet of concrete impoundments, fish ladders, and narrowing of the channel due to debris dams.

A few, dry (at the time of the site assessment) drainage channels outlet into the creek at various locations. One location, near the commercial car lots to south, shows evidence of major erosion and sedimentation into the creek. A large network of gabions has been installed at this location.

San Luis Obispo Creek

San Luis Obispo Creek originates at the top of Cuesta Pass, generally paralleling US-101, and outlets to the Pacific Ocean in Avila Beach. The study area began where the creek passes under Prado Road, and ended where the creek passes under South Higuera Street, near the northbound Higuera Street on-ramp to the south of the City of San Luis Obispo.

This reach of San Luis Obispo Creek is largely bordered by residential and commercial development until it passes under LOVR. At this point, the creek is bordered by a strip of land between US-101 and the creek to the west and fallow agricultural fields to the east. Evidence of urban debris was found throughout the creek, including large debris deposits as high as 11 feet.

The substrate consists of medium to small cobbles, with numerous pools of varying origin (plunge pools, mid-channel pools, step pools, channel confluence pools, corner pools, lateral scour pools, The gradient of the stream is low to moderate with water continuously flowing through a variety of stream types including riffles, runs, glides, and areas of deep somewhat still pools. The Prado to LOVR reach was observed during the survey to be mostly shallow riffle type habitat less than three feet deep. The wastewater treatment plant contributes flows and the Prefumo Creek confluence had a relatively large pool area greater than four feet deep. The LOVR to Higuera Street bridge reach was observed to support all the stream types listed above and had varying depths with several deeper areas (greater than four feet deep) created at locations of scouring flows.

The vegetation varies from a partially open canopy to dense stands of riparian trees that overhang the water. The riparian habitat is dominated by arroyo willow with cottonwood *(Populus fremontii)*, sycamore *(Plantanus racemosa)*, and walnut trees *(Juglans californica)* scattered throughout the riparian habitat. There is very little streamside emergent vegetation present throughout the study area where flows are slow enough to accommodate growth. Several areas of dense giant reed (*Arundo donax*) occur along the creek banks. The banks above the creek and above top of bank support dense stands ruderal vegetation composed primarily of hemlock, mustard, and thistles. Vagrant encampments were also noted throughout much of San Luis Obispo Creek.

Abandoned Wastewater Treatment Ponds

Two abandoned wastewater treatment ponds and associated "raceways" (wastewater facilities) owned by the City are located east of US-101 within the project study area. Although the northern pond supports freshwater marsh vegetation, this pond does not contain open water year-round due to small mammal burrow and compromised berm integrity (City. Otte, Freddy. June 2006. Personal communication). The southern pond contains open water year-round and supports small patches of freshwater marsh plants and willows.

Prior to the site assessment, the northern pond was drained by the City in accordance with maintenance activities and was almost entirely dry at the time of survey. The southern pond contains small patches of freshwater marsh and arroyo willow plants along the perimeter of the pond. Seven abandoned wastewater treatment raceways (approximately 300 feet long) are located directly south of the southern pond. The raceways are concrete and do not support emergent vegetation.

Bulrush-Cattail Series

The seasonal freshwater marshes that include bulrush and cattail are dominated by a mixture of cattails *(Typha latifolia)*, tule *(Scirpus acutus)*, sedges *(Carex* sp. and *Cyperus* sp.*)* rushes (*Juncus tenuis* and *Juncus phaeocephalus*), and herbaceous dicots *(Cirsium vulgare* and *Rumex salicifolius)*. These communities are associated with floodplain areas within the project boundary, along drainages, near freshwater seeps and springs, and in the northern abandoned treatment pond. Water smartweed *(Polygonum amphibium* var. *emersum)* is present within this community in Prefumo Creek and the wastewater treatment ponds. Salt grass *(Distichlis spicata)* is also present at the wastewater treatment ponds.

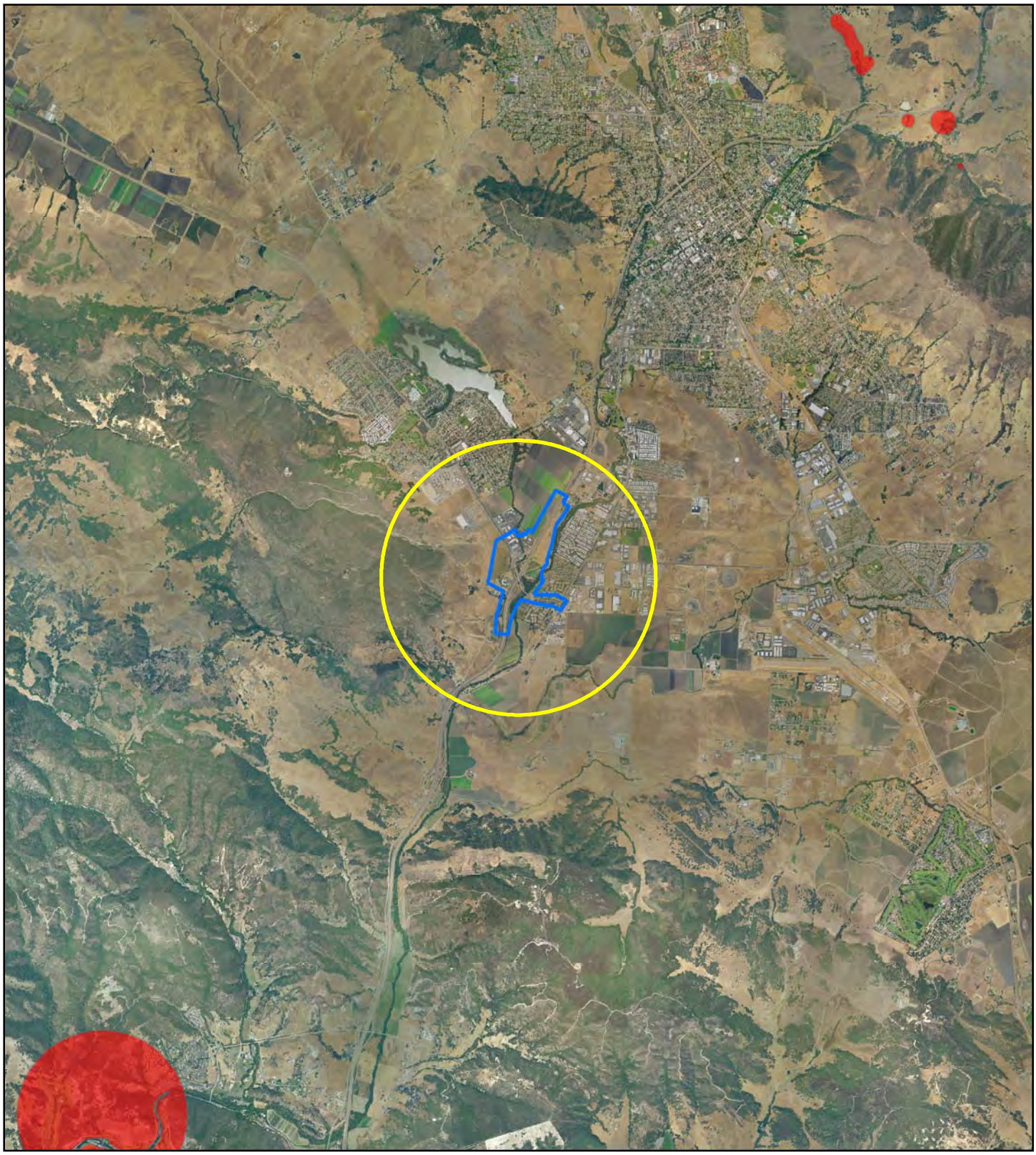

FIGURE 2

LEGEND

Project Area

One Mile Buffer

Red-Legged Frog Sightings (CNDDB)

0 0.5 1

Miles

Los Osos Valley Road/Route 101 Interchange

California Red-Legged Frog Sightings

California Natural Diversity Database

SOURCE: Airphoto USA (2003)

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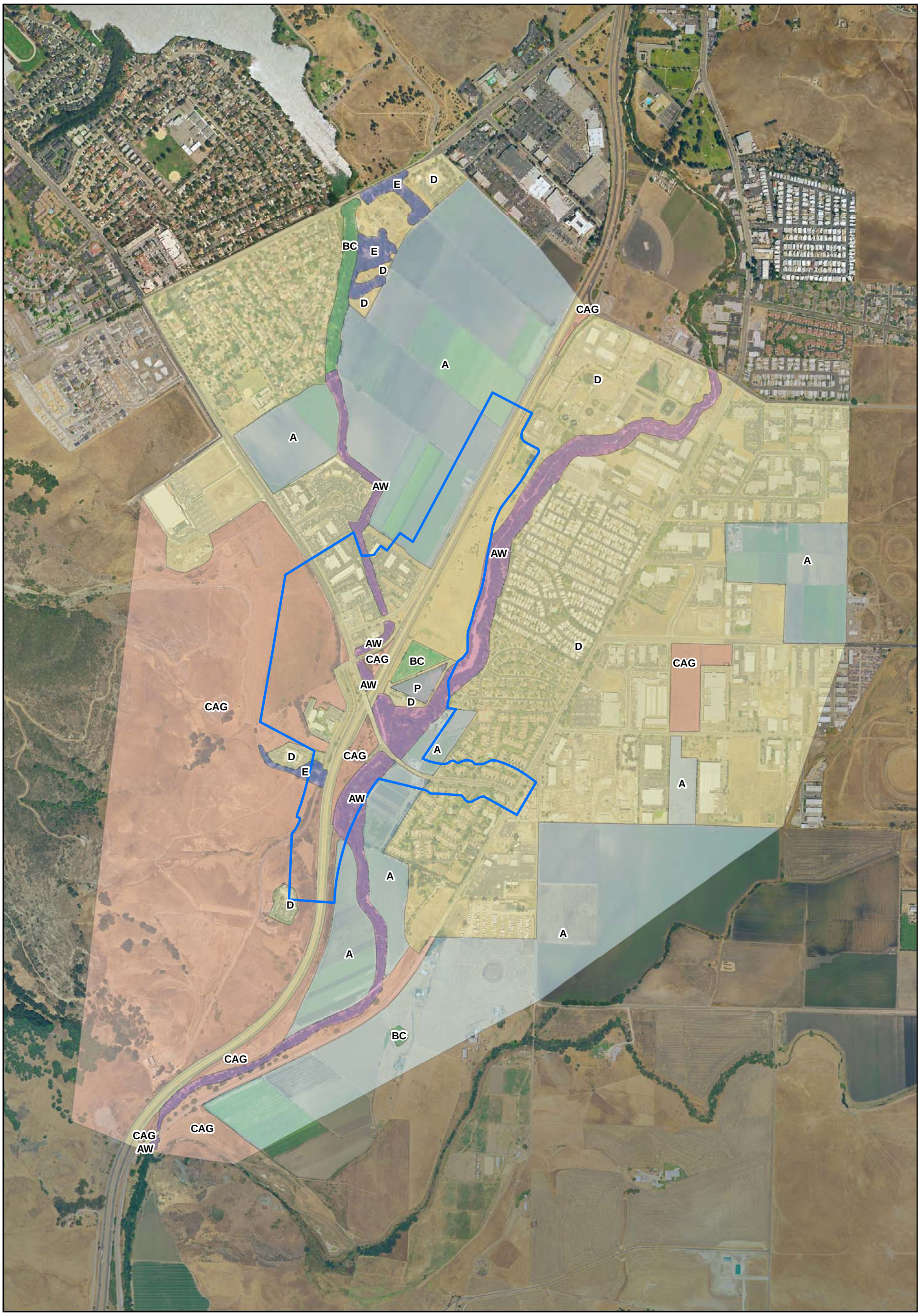

LEGEND

Project Area

Habitat Type

Agriculture (A)

Arroyo Willow (AW)

Bulrush-Cattail (BC)

California Annual Grassland (CAG)

Developed (D)

Eucalyptus/Ornamental (E)

Water Treatment Pond (P)

N

0 500 1,000

FEET

SOURCE: Airphoto USA (2003)

FIGURE 3

Los Osos Valley Road/Route 101 Interchange

Habitat Community and Surrounding Uses within One Mile of the Project Area

I:\DEC0603\GIS\Fig3_habitat_community.mxd (08/15/06)

California Annual Grassland Series
Species associated with annual grassland communities, including ripgut brome *(Bromus diandrus)* mustards *(Brassica* sp.*)*, and wild oat *(Avena fatua)*, are noted along LOVR, US-101, and southwest of the project area. This community is also present east of the abandoned wastewater treatment plant. This area experiences disturbances including mowing and landscaping. Other species noted within these areas include soft chess *(Bromus hordeaceus)*, California poppy *(Eschscholzia californica)*, and rattail fescue *(Vulpia hirsuta)*. Scattered cypress *(Cupressus* sp.*)* and pine *(Pinus* sp.*)* trees have been planted east of US-101 near the wastewater treatment plant.

Arroyo Willow Series
This vegetation community exists throughout the project area along Froom Creek, Prefumo Creek, San Luis Obispo Creek, and in scattered pockets at the wastewater treatment ponds. This riparian series is dominated by large, continuous stands of arroyo willow *(Salix lasiolepis)*, with coyote brush *(Baccharis pilularis*) occurring as a near co-dominant. Mulefat *(Baccharis salicifolia)* stands are commonly intermixed with the willows on the banks of Prefumo and San Luis Obispo Creeks. Willows are also noted in a few areas along the perimeter of the abandoned treatment ponds. The understory consists of California blackberry *(Rubus ursinus)* found on a majority of the stream banks of Prefumo and San Luis Obispo Creeks. Other native species include poison oak *(Toxicodendron diversilobum)*, coffeeberry *(Rhamnus californica)*, and black sage *(Salvia mellifera)*. Many nonnative herbaceous species are dispersed within this community, including sweet fennel *(Foeniculum vulgare)*, Italian thistle *(Carduus pycnocephalus)*, honeysuckle (*Lonicera japonica*) and poison hemlock *(Conium maculatum)*.

Agriculture
The northeastern portion of the proposed project area contains active or fallow agricultural fields, which are characterized by agricultural crops, ruderal forbs, and nonnative grasses.

Developed
Developed areas are those that do not support plant life, are paved, graded, or developed. Several areas in and around the project area support commercial development.

Habitat Types and Land Uses Within a One-Mile Radius of the Project Site

The following description of habitat types and land uses within one mile of the project area is based on what could be identified from survey efforts, aerial photographs, and public roads. Habitat types and land uses within one mile of the project study area are similar to those listed within the project boundary. Residential developments, agricultural areas, annual grassland, and riparian woodland exist within one mile of the project study area.

California Annual Grassland – Coast Live Oak Series
This habitat complex is predominately characterized by annual grassland species such as ripgut brome, mustards, and wild oat. Scattered pockets of coast live oak trees *(Quercus agrifolia*) exist west of US-101 and along road sides. In addition to a coast live oak cover overstory, this habitat includes California sagebrush *(Artemisia californica)*, black sage, poison oak, and other sage scrub species. Oaks and scrub are noted west of US-101 and south of LOVR.

Pond
A small pond was located using an aerial photograph approximately one-quarter mile from San Luis Obispo Creek and one-half mile from the project boundary. Access was not available; therefore, this pond was not able to be surveyed as part of the site assessment. Visual observations from the nearest public road suggest that this pond likely supports bulrush.

Agriculture
Active and fallow agricultural fields, which are characterized by agricultural crops, ruderal, nonnative grasses, and bare ground, exist adjacent to the northern limits of the project area, west of US-101.

Developed
Developed areas are those that do not support plant life, are paved, graded, or developed. Numerous roads and developments are present within one mile of the project area including industrial/commercial buildings and residential developments.

Eucalyptus/Ornamental
Groves of blue gum *(Eucalyptus globulus bicostata)* and cypress trees line portions of South Higuera Street and LOVR. These species frequently occur within one mile of the project study area near residential developments.

SUMMARY

Suitable habitat for CRLF within one mile of the project is reduced due to channelized drainages and associated fast water. Although deep pools and riparian vegetation exist within the project boundary and within one mile of the proposed project limits, suitable breeding and upland habitat for CRLF is limited.

In the study area, Prefumo Creek and San Luis Obispo Creek are surrounded by developed or agricultural areas. As a result, these two creeks are highly channelized and are not protected from high flows and fast water. During the breeding season, these creeks experience high flows of up to 11 feet and do not provide ponded areas suitable for CRLF egg deposits. Although there is suitable breeding habitat in the northern pond during the rainy season, very little standing water was observed during the site assessment (approximately 3 inches in depth in one small corner of the pond) and no CRLF were observed. The adjacent southern wastewater treatment pond is mainly open water and is managed to provide habitat for waterfowl.

San Luis Obispo Creek, Prefumo Creek, and the wastewater treatment area support bullfrog *(Rana catesbeiana)* and crayfish *(Orconectes rusticus)* populations. A few large bullfrogs and one southwestern pond turtle were observed in the southern pond during the site assessment. The City has indicated that the water level of this pond is typically maintained at 12 inches (City. Otte, Freddy. June 2006. Personal communication). Hundreds of crayfish, numerous bullfrogs, and carp were observed within Prefumo and San Luis Obispo Creeks during the site assessment. These species prey on native amphibians such as CRLF and, coupled with habitat alteration, may promote the decline of CRLF in aquatic ecosystems (Lawler, Dritz, Strange, and Holyoak 1999; Keisecker, Chivers, Anderson, and Blaustein 2002; Moyle 1973). In addition, numerous adult bullfrogs and three pond turtles were observed in the concrete raceways near the treatment ponds. Hundreds of pacific treefrogs *(Pseudacris regilla)* were heard throughout the project area.

California red-legged frogs are not expected to occur within one mile of the project boundary based on the existing habitat conditions. In addition, no recent records exist showing CRLF occurring within one mile of the proposed project boundary.

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APPENDIX A

PHOTOGRAPHS

APPENDIX A: PHOTOGRAPHS

San Luis Obispo Creek, view south, near the S. Higuera survey boundary.

Prefumo Creek, view east, between Laguna Lake and US 101.

APPENDIX A: PHOTOGRAPHS

Southern abandoned treatment pond, view southwest.

Northern abandoned treatment pond, view west.

APPENDIX A: PHOTOGRAPHS

Froom Creek, view west, from Calle Joaquin.

Fallow field south of Prefumo Creek, view east, near car dealerships.

APPENDIX B

DATA SHEETS

Appendix D.
California Red-legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Site Assessment: 06/07/06
(mm/dd/yyyy)

Site Assessment Biologists: Langle, Brooke (Last name) (first name) Kirschenstein, Jason (Last name) (first name)
Wolff, David (Last name) (first name) Otte, Freddy (Last name) (first name)

Site Location: San Luis Obispo Co., San Luis Obispo Creek
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: LOVR / Highway 101 interchange
Brief description of proposed action:
Highway interchange expansion

1) Is this site within the current or historic range of the CRF (circle one)? YES NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? YES NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION
(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:

Size: _____ Maximum depth: _____

Vegetation: emergent, overhanging, dominant species: _____

Substrate: _____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Appendix D.
California Red-legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: _____
Depth at bank full: _____
Stream gradient: _____

Are there pools (circle one)? YES NO
If yes,
Size of stream pools: _____
Maximum depth of stream pools: _____

Characterize non-pool habitat: run, riffle, glide, other: _____
_____
_____

Vegetation: emergent, overhanging, dominant species: _____
_____
_____

Substrate: _____
_____

Bank description: _____
_____
_____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species location

Appendix D.
California Red-legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Site Assessment: 05/30/2006
(mm/dd/yyyy)

Site Assessment Biologists: Langle, Brooke (Last name) (first name) Cohn, Sara (Last name) (first name)

_____ (Last name) (first name) _____ (Last name) (first name)

Site Location: San Luis Obispo Co., Prefumo Creek
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Love/Highway 101 interchange
Brief description of proposed action:
Highway interchange expansion.

1) Is this site within the current or historic range of the CRF (circle one)? YES NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? YES NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION
(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:
Size: N/A Maximum depth: _____

Vegetation: emergent, overhanging, dominant species: _____

Substrate: _____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: N/A

Appendix D.
California Red-legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: _____
Depth at bank full: _____
Stream gradient: _____

Are there pools (circle one)? YES NO
If yes,
Size of stream pools: _____
Maximum depth of stream pools: _____

Characterize non-pool habitat: run, riffle, glide, other: _____

Vegetation: emergent, overhanging, dominant species: _____

Substrate: Mostly clays Some pockets of gravel

Bank description: _____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species location

Appendix D.

California Red-legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by_____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Site Assessment: 06/07/2006
(mm/dd/yyyy)

Site Assessment Biologists: WOIFF David
(Last name) (first name) (Last name) (first name)

Kirchenstein Jason
(Last name) (first name) (Last name) (first name)

Site Location: San Luis Obispo County, SLO Creek Los Osos Valley Rd to Higuera St Bridge
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd / Hwy 101 Interchange
Brief description of proposed action:
LOVR/Hwy 101 Interchange improvements

1) Is this site within the current or historic range of the CRF (circle one)? YES NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? YES NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION

(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:

Size: _____ Maximum depth: _____

Vegetation: emergent, overhanging, dominant species: _____

Substrate: _____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Site Assessment
LOVR → Highway 58 Bridge
6/7/06

Appendix D.

California Red-legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: + 50 Feet

Depth at bank full: upwards of 10' + likely

Stream gradient: moderate

Are there pools (circle one)? YES NO

If yes,

Size of stream pools: 10'-20' wide 20'-100' Long

Maximum depth of stream pools: 6 Feet during survey mostly less than 4 feet deep

Characterize non-pool habitat: run riffle glide other: _____

Vegetation: emergent, overhanging, dominant species: Riparian willow, Cottonwood, Sycamore, Walnut Very little streamside emergent veg.

Substrate: Rock, Cobble, mud, Few boulders

Bank description: Steep earth banks w/ Riparian Vegetation Ruderal non-native weedy herbaceous cover (Hemlock, mustard, thistles)

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

High winter season flood stage could be limiting factor

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species location

Appendix D.

California Red-legged Frog Habitat Site Assessment Data Sheet

Site Assessment reviewed by_____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Site Assessment: 06/07/2006
(mm/dd/yyyy)

Site Assessment Biologists: WOLFF David (Last name) (first name) _____ (Last name) (first name)

Kirschstein Jason (Last name) (first name) _____ (Last name) (first name)

Site Location: San Luis Obispo County, SLO Creek Prado Rd to Los Osos Valley Rd
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd/Hwy 101 Interchange
Brief description of proposed action:
LOVR/Hwy 101 Interchange Improvements

1) Is this site within the current or historic range of the CRF (circle one)? YES NO

2) Are there known records of CRF within 1.6 km (1 mi) of the site (circle one)? YES NO
If yes, attach a list of all known CRF records with a map showing all locations.

GENERAL AQUATIC HABITAT CHARACTERIZATION

(if multiple ponds or streams are within the proposed action area, fill out one data sheet for each)

POND:

Size: _____ Maximum depth: _____

Vegetation: emergent, overhanging, dominant species: _____

Substrate: _____

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Site Assessment
Prado → Lower
6/7/06

Appendix D.

California Red-legged Frog Habitat Site Assessment Data Sheet

STREAM:

Bank full width: + 50 Feet
Depth at bank full: upwards of 10 Feet likely
Stream gradient: moderate

Are there pools (circle one)? YES NO

If yes,

Size of stream pools: 10'-20' wide 20'-50' Long
Maximum depth of stream pools: 6 Feet during survey
most less than 4 feet deep

Characterize non-pool habitat: run riffle glide other: _____

Vegetation: emergent, overhanging, dominant species: Riparian
willow, cottonwood, sycamore, walnut
Very little emergent streamside veg.

Substrate: Rock, cobble, mud, few Boulders

Bank description: steep earth banks w/ Riparian vegetation
Ruderal non-native weedy herbaceous cover
(Hemlock, mustard, thistles)

Perennial or Ephemeral *(circle one)*. If ephemeral, date it goes dry: _____

Other aquatic habitat characteristics, species observations, drawings, or comments:

High winter season Flood stage
could be limiting factor

- City of SLO WWTP discharges upstream of Lower Bridge
- Prefumo Crk confluence upstream of Lower Bridge

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species location

APPENDIX B: SITE PHOTOS

APPENDIX B: PHOTOGRAPHS

Juvenile *Rana aurora draytonii*, southeastern raceway 08-09-06.

Adult *Rana aurora draytonii*, southern raceway 08-10-06.

APPENDIX B: PHOTOGRAPHS

Southern abandoned treatment pond, view southwest.

Northern abandoned treatment pond, view west.

APPENDIX B: PHOTOGRAPHS

Typical stretch of Prefumo Creek, view east.

Southern reach of San Luis Obispo Creek.

APPENDIX C: DATA SHEETS

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy)

Survey Biologist: Lancle, Brooke (Last name) (first name)

Survey Biologist: Ohe, Fredric (Last name) (first name)

Site Location: San Luis Obispo Co. Prefumo Creek, 10 710729E 39 04270N UTM
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).
Madonna 1/2 mile downstream

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:

Highway expansion project

Type of Survey (circle one): DAY NIGHT

BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 1:00 pm.

End Time: 4:00 p.m.

Cloud cover: —

Precipitation: —

Air Temperature: 75°F

Water Temperature: 70°F

Wind Speed: —

Visibility Conditions: —

Moon phase: Waxing - new

Humidity: _____

Description of weather conditions: Clear, warm

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Orion Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
—					

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: crayfish, carp

Other notes, observations, comments, *etc.*

Mosquito fish present.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 05/30/2006 (mm/dd/yyyy) **Survey Biologist:** Langle, Brooke (Last name) (first name)
Survey Biologist: Cotny, Sara (Last name) (first name)

Site Location: San Luis Obispo Co., Prefumo Creek, 10 710728E UTM
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). 3904270N
From Calle Joaquin 1/2 mile upstream

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Road/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2:30p.m. **End Time:** 5:30p.m

Cloud cover: None **Precipitation:** None

Air Temperature: 74°F **Water Temperature:** 70°F

Wind Speed: slight **Visibility Conditions:** Clear

Moon phase: Waxing-new **Humidity:**_____

Description of weather conditions: Warm, clear day

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Orion Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	10+	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Evidence of raccoons (tracks). Numerous large carp observed. Hundreds of crayfish. Urban debris common. Domestic cats nearby.

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (USFWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy)

Survey Biologist: WOLFF (Last name) David (first name)

Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO Creek Prado Rd to Los Osos Valley Rd.
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd/Hwy 101 Interchange
Brief description of proposed action:
LOVR / Hwy 101 Interchange Improvements

Type of Survey (circle one) **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 1PM **End Time:** 4PM

Cloud cover: 0 **Precipitation:** 0

Air Temperature: 74°F **Water Temperature:** 71°F

Wind Speed: 0-5mph **Visibility Conditions:** 100%

Moon phase: 1st QTR **Humidity:** _____

Description of weather conditions: Sunny Mild

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Orion/Braunton 8x42

1st Daytime
Prado → LOWR
6/7/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Bullfrog	3	O	Larvae	No Legs	100%
Pseudacris	many	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Few Bullfrogs
High winter flows

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by: _____ (FWS field office) _____ (date) _____ (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Mirschberstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO creek Los Osos Valley Rd to Higuera St Bridge
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd / Hwy 101 Interchange
Brief description of proposed action:
LOVR / Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 4PM **End Time:** 6PM

Cloud cover: 0 **Precipitation:** 0

Air Temperature: 74°F **Water Temperature:** 71°F

Wind Speed: 0-5mph **Visibility Conditions:** 100%

Moon phase: 1st QTR **Humidity:** _____

Description of weather conditions: Sunny Mild

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton/Orion 8x42

1st Daytime
LOVR → Higuera St Bridge
6/7/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris	Many	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: High winter flows

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/07/08 (mm/dd/yyyy) **Survey Biologist:** Langle (Last name), Brooke (first name)

Survey Biologist: Ette (Last name), Freddy (first name)

Site Location: San Luis Co. San Luis Obispo Creek (LOVR/S.Higuera
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: LOVR/US-101 interchange
Brief description of proposed action:
Highway interchange Project

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 6:00pm **End Time:** 6:45pm

Cloud cover: None **Precipitation:** —

Air Temperature: 74°F **Water Temperature:** 71°F

Wind Speed: Slight **Visibility Conditions:** 100%

Moon phase: Waxing 1/4 **Humidity:** _____

Description of weather conditions: Warm, mild

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Orion, Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
—					

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed

Other notes, observations, comments, *etc.*

Lots of fast moving water.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy) Survey Biologist: Langle (Last name) Brooke (first name)
Survey Biologist: Otte (Last name) Freddy (first name)

Site Location: San Luis Obispo, Froom Creek, UTM 1071075 1E 3902416N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S) (WGS 84 / NAD 83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Los Osos Valley rd/Highway 101 interchange
Brief description of proposed action:
Expansion of interchange to accommodate increasing traffic.

Type of Survey (circle one): (DAY) NIGHT (BREEDING) NON-BREEDING

Survey number (circle one): (1) 2 3 4 5 6 7 8

Begin Time: 5:30 p.m. End Time: 5:50 p.m.

Cloud cover: Clear Precipitation: None

Air Temperature: _____ Water Temperature: _____

Wind Speed: Slight Visibility Conditions: Clear

Moon phase: N/A Humidity: _____

Description of weather conditions: Clear day, slight breezes

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? (YES) NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	50+	H	Adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed

Other notes, observations, comments, *etc.* This creek has a concrete-lined, narrow channel & receives some regular "landscape maintenance" by the adjacent H.O.A. The water level is low, and there is little cover/refugia. Some pools exist within channel, cobble bottom where not altered.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy) **Survey Biologist:** Langle (Last name) Brooke (first name)
Survey Biologist: Ohe (Last name) Freddy (first name)

Site Location: San Luis obispo co, Treatment ponds UTM 1071038E 3902664N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Love / US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): **DAY NIGHT** **BREEDING NON-BREEDING**

Survey number (circle one): **1 2 3 4 5 6 7 8**

Begin Time: 4:30pm **End Time:** 5:15pm

Cloud cover: — **Precipitation:** —

Air Temperature: 75°F **Water Temperature:**

Wind Speed: Slight **Visibility Conditions:** Clear

Moon phase: waxing - New **Humidity:**

Description of weather conditions: Slightly breezy

Brand name and model of light used to conduct surveys: N/A

Were binoculars used for the surveys (circle one)? **YES NO**
Brand, model, and power of binoculars: Orion Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	6	O	Adult		100%
Pseudacris regilla	30+	O	Adult/tadpoles		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/07/06 (mm/dd/yyyy) **Survey Biologist:** Lancle (Last name) Brooke (first name)
Survey Biologist: Otte (Last name) Freeley (first name)

Site Location: San Luis Obispo, Prefumo Creek, UTM 10 710788E 3704270N NAD83
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S)

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: LOVR/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): **DAY NIGHT** **BREEDING NON-BREEDING**

Survey number (circle one): **1 2 3 4 5 6 7 8**

Begin Time: 9:30 p.m **End Time:** 12:30 p.m

Cloud cover: — **Precipitation:** —

Air Temperature: 66 – 64° F **Water Temperature:** 62 – 63°F

Wind Speed: Slight **Visibility Conditions:** Clear

Moon phase: 90% full **Humidity:** —

Description of weather conditions: Western Rivers Mighty Max
Clear

Brand name and model of light used to conduct surveys: ✓

Were binoculars used for the surveys (circle one)? **YES NO**
Brand, model, and power of binoculars: Orion, Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	2	O	Adult		100%
Pseudacris regilla	100+	H/O	Adult/tadpoles		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Numerous crayfish, carp, few bullfrogs; domestic cat, raccoon

Other notes, observations, comments, *etc.*

Bordered by residential & business for stretches. Lots of deep (5+ feet) mid-channel pools & overhanging vegetation. Urban debris. Mosquito fish present

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/07/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo, SLO Creek Los Osos Valley Rd to Higuera St Bridge
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd/Hwy 101 Interchange
Brief description of proposed action:
LOVR/Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:30PM **End Time:** 1:30AM

Cloud cover: Fog **Precipitation:** 0

Air Temperature: 72°F **Water Temperature:** 71°F

Wind Speed: Negligible **Visibility Conditions:** Good

Moon phase: 1st QTR **Humidity:**_____

Description of weather conditions: mild

Brand name and model of light used to conduct surveys: Maglite 4-D

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton Orion 8x42

1st Nighttime
LOVR → Higuera St Bridge.
6/7/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Bullfrog	2	O	Larvae	NO Tags	100%
Pseudacris	Many	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Few Bullfrogs
High Winter flows
Raccoons

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____ _____ _____ (FWS Field Office) (date) (biologist)

Date of Survey: 6/12/2006 (mm/dd/yyyy) **Survey Biologist:** Lacy (Last name) Tim (first name)
Survey Biologist: Lichtwardt (Last name) Eric (first name)

Site Location: San Luis Obispo Co, City of San Luis Obispo, San Luis Obispo Creek from Prado Rd to Los Osos Valley Rd.
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S)
****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd. Interchange Improvement
Brief description of proposed action: CRLF survey
Reconstruction of Los Osos Valley Rd overpass over Hwy 101 and realignment of on/off ramps.

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2210 **End Time:** 0030 (06/09/2006)

Cloud cover: Clear **Precipitation:** none

Air Temperature: 66°F / 64°F (start / end) **Water Temperature:** 63°F / 64°F (start / end)

Wind Speed: No appreciable wind in creek **Visibility Conditions:** Clear

Moon phase: Moon approx. 90% full* **Humidity:**

Description of weather conditions: Overall clear conditions, bright moon provides good visibility. No appreciable wind in creek channel.

Brand name and model of light used to conduct surveys: MagLight - 3 "D" cell & 4 "D" cell

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: 2 @ 10x40 (both surveyors)

* Waxing moon. Full moon on 6/11/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	100s	H	adult	N/A	100%
Rana catesbeiana	5	O	tadpoles		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Bullfrog tadpoles observed, but no adults observed during survey. Crayfish also observed in creek.

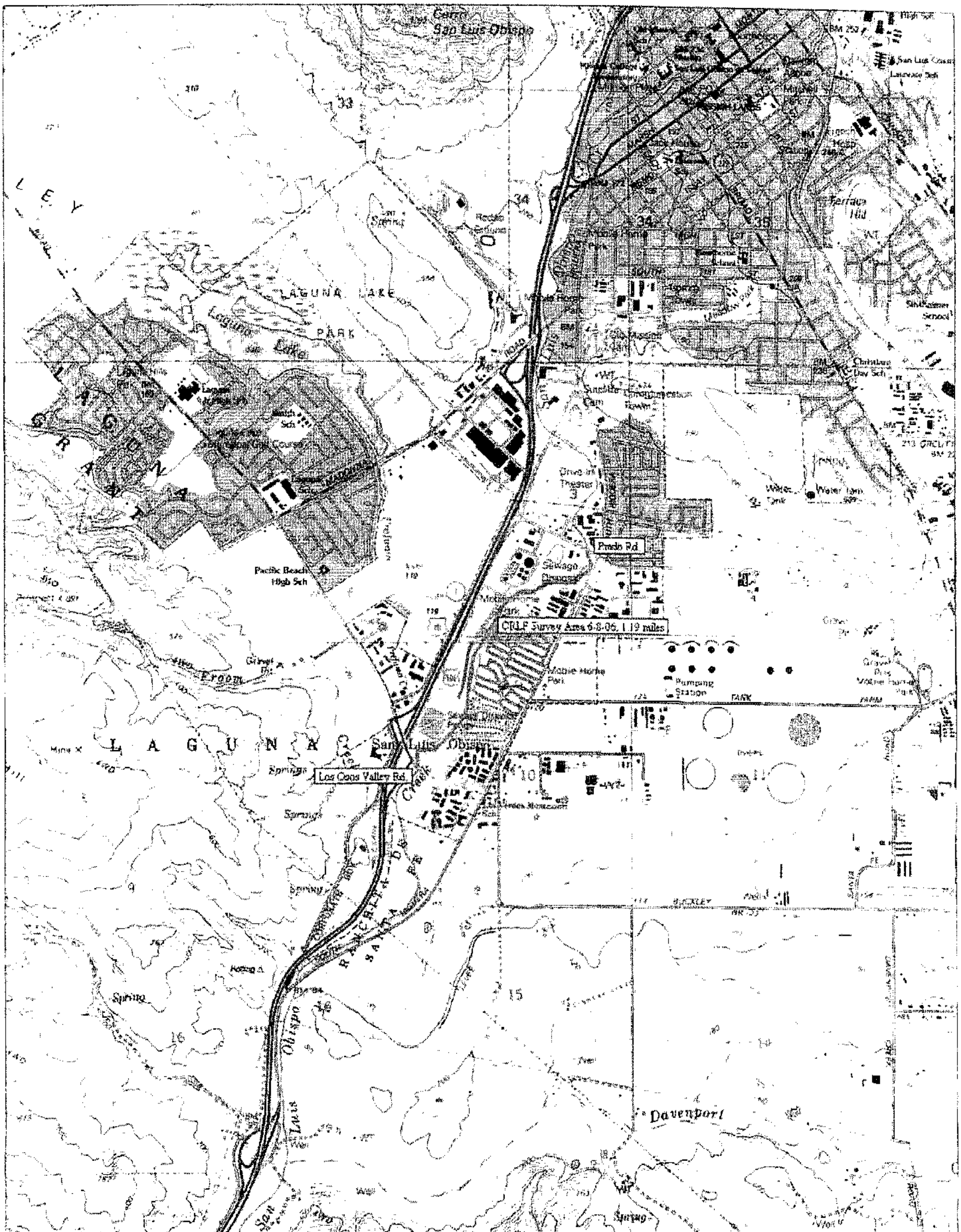
Other notes, observations, comments, *etc.*

other species observed in creek:
stickleback
specacled dace
rainbow trout/steelhead (1)
bat - foraging over channel
crayfish

This reach of creek has a well developed and intact riparian corridor. Creek bottom is primarily gravel + cobbles. Some pools up to 36" deep, but most of reach 6-12 inch deep water. Debris line along banks indicate that creek rises to 8-9' during high winter flows.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

T. Lacy
Field Notes

8 June 2006
SLO Creek CRLF Survey
805-458-1621 John

Start - 10:10 am Prado Bridge
Temp (air) - 66°F
Temp (water) - 63°F
Calling Pseudacris
Clear - moon almost full
No approc. wind.

End Los Osos Vly Rd Bridge
12:30 AM 6/9/06
Temp (air) 64°F
Temp (water) 64°F

Bullfrog tadpoles (5)
Pseudacris - calling only
Stickleback
Specacled dace
1 rainbow trout
bat (unident)
Cobble, bottom and gravel all the way in this reach.

Appendix E.

California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/08/06 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: San Luis Obispo, Froom Creek, 10 710751E 3902416N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS 84/ NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Los Osos Valley Rd/Highway 101 interchange
Brief description of proposed action:
Expansion of interchange to accommodate increasing traffic.

Type of Survey (circle one): DAY ~~NIGHT~~ BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 10:10 p.m. End Time: 10:40 p.m.

Cloud cover: None Precipitation: None

Air Temperature: 66°F Water Temperature: 66°F

Wind Speed: 0-5 mph Visibility Conditions: Clear

Moon phase: Waxing - 90% Humidity: _____

Description of weather conditions: Clear; occasional light breeze, good visibility

Brand name and model of light used to conduct surveys: Western Rivers Mighty MAX

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	50+	H	Adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed

Other notes, observations, comments, *etc.* Shallow, quick running water near undercrossing @ Calle Joaquin. A few shallow pools with no cover exist in main channel. Creek is completely dry ~500' west of undercrossing. Bright lights from adjacent motel! North Bank veg. maintained/cut by motel.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/07/06 (mm/dd/yyyy)

Survey Biologist: Langle Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: San Luis Obispo, Treatment ponds UTM 1071038E 3902664N NAD83
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Laur/US-101 interchange
Brief description of proposed action:
Highway expansion interchange

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 12:45 p.m. End Time: 1:30 a.m.

Cloud cover: — Precipitation: —

Air Temperature: 64°F Water Temperature: _____

Wind Speed: Slight - 0mph Visibility Conditions: Clear

Moon phase: 90% Humidity: _____

Description of weather conditions: Clear

Brand name and model of light used to conduct surveys: Western Rivers Mighty Max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	11	O	Adult		100%
Pseudacris regilla	20+	O/H	Adult/Juv/tadpoles		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs locally abundant.

Other notes, observations, comments, *etc.*

No frogs observed in ponds. All frogs in concrete "aqueduct".

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.

California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/20/2006 (mm/dd/yyyy) Survey Biologist: Langle (Last name) Brooke (first name)

Survey Biologist: Cohn (Last name) Sara (first name)

Site Location: SLO County, Perfumo Creek UTM 1071072 8E 3904270N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS84/NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:

Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 1:30 pm End Time: 4:00 pm

Cloud cover: none Precipitation: none

Air Temperature: 74° Water Temperature: 65°

Wind Speed: none Visibility Conditions: Clear

Moon phase: _____ Humidity: _____

Description of weather conditions: Sunny, clear, calm - good visibility

Brand name and model of light used to conduct surveys: ___

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	1	O	Adult	n/a	100%
Pseudacris regilla	100s	O/H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrog, numerous crayfish, [illegible], racoon tracks (O)

Other notes, observations, comments, *etc.*

water has receded since 1st survey. approx 4" since last survey.
1st time we saw pseudacris frogs active around creek.
lots of urban debris + trash
- Observed juvenile Cooper's hawk

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 04/23/2006 (mm/dd/yyyy)

Survey Biologist: Cohn Sara (Last name) (first name)

Survey Biologist: Double Dee Rebecca (Last name) (first name)

Site Location: SLO Co. SO Creek (Prado to Love), UTM 10711988 E 7119 88E 3903813 N (WGS 84/NAD83
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVE/ 101 Interchange
Brief description of proposed action:

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 11:45 a.m. End Time: 13:30

Cloud cover: clear/sunny Precipitation: none

Air Temperature: 76° Water Temperature: 67°

Wind Speed: none Visibility Conditions: clear

Moon phase: n/a Humidity: n/a

Description of weather conditions: sunny, warm

Brand name and model of light used to conduct surveys: n/a

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Rugged exposure 10x50

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Cyprinus auratus	2	O	adult		100%
Oncorhynchus rustica	10's	O	adult		100%
Rana catesbiana	1	O	tadpole		100%
Gambusia affinis	100's	O	minnow/adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bull frog tadpoles, crayfish, large carp (up to 2' (feet) in length)

Other notes, observations, comments, *etc.*

cobble, rock bottom. Creek has dropped approx 2". Deep spots up to 20" - mainly 4-12" deep.

Mosquito fish also noted in this reach

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.

California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/22/2006 (mm/dd/yyyy)

Survey Biologist: Cohn (Last name) Sara (first name)

Survey Biologist: DoubleDee (Last name) Rebecca (first name)

Site Location: SLO Co. SLO Creek (LOVR to S. Higuera)
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVR / 101 Interchange
Brief description of proposed action:

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 14:20 End Time: 16:45

Cloud cover: clear / sunny Precipitation: none

Air Temperature: 77° Water Temperature: 68°

Wind Speed: none Visibility Conditions: clear

Moon phase: N/a Humidity: N/a

Description of weather conditions: Sunny, warm, dry

Brand name and model of light used to conduct surveys: N/a

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Rugged Exposure 10x50

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Cyprinus aurata	1	O	adult		100%
Rana catesbiana	2	O	tadpoles		100%
Gambusia affinis	100's	O	minnow/adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrog tadpoles noted in backwater areas. Large carp (1 to 2 feet) noted in creek. Mostly fast H_2O w/ deep scattered pools.

Other notes, observations, comments, *etc.*

Cobble, rock bottom. Deep pools as much as 36". Transient encampments encountered.

Mosquito fish also noted throughout this reach.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/20/2006 (mm/dd/yyyy)

Survey Biologist: Langle Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: San Luis Obispo Co., Froom Creek UTM 1071075 1E
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S) 3900416 N

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 5:30 p.m. End Time: 6:00 p.m.

Cloud cover: none Precipitation: None

Air Temperature: 55°F Water Temperature: _____

Wind Speed: Slight Visibility Conditions: Clear

Moon phase: _____ Humidity: _____

Description of weather conditions: _____

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	5+	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Disturbed Area

Other notes, observations, comments, *etc.*

Water continuing to drop/dry.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/20/2004 (mm/dd/yyyy) Survey Biologist: Langle (Last name) Brooke (first name)

Survey Biologist: Cohen (Last name) Sara (first name)

Site Location: SLO County, Wastewater treatment ponds (County, General location name, UTM Coordinates or Lat./Long. or T-R-S). UTM 1071103 9E 3902664 N

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love / US-101 interchange

Brief description of proposed action:

Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 4:15 pm End Time: 5:00 pm

Cloud cover: clear / none Precipitation: none

Air Temperature: 58° Water Temperature: _____

Wind Speed: ~10 mph Visibility Conditions: clear

Moon phase: _____ Humidity: none

Description of weather conditions: _____

Brand name and model of light used to conduct surveys: n/a

Were binoculars used for the surveys (circle one)? YES NO 8x42

Brand, model, and power of binoculars: Omni, Advanced [redacted]

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	12	O	Adult		100 %
Clemmys marmorata		O	Adult		100 %

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs, one pond recently drained

Other notes, observations, comments, *etc.*
One pond has suitable habitat, but was recently drained. Adjacent pond mostly standing H_2O w/ pockets of willows + tules. Large bullfrogs noted in this pond.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/14/06 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: Cohn, Sara (Last name) (first name)

Site Location: San Luis Obispo, Prefumo Creek, 10 720728E 3904270N UTM (County, General location name, UTM Coordinates or Lat./Long. or T-R-S) (CAG, S84/NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love / US-101 interchange

Brief description of proposed action:

Highway expansion project

Type of Survey (circle one): DAY (NIGHT) (BREEDING) NON-BREEDING

Survey number (circle one): 1 (2) 3 4 5 6 7 8

Begin Time: 9:50 p.m. End Time: 12:45 a.m.

Cloud cover: None Precipitation: None

Air Temperature: 53 – 55°F Water Temperature: _____

Wind Speed: None Visibility Conditions: Clear

Moon phase: Waning – 80% Humidity: _____

Description of weather conditions: Clear, calm – good visibility

Brand name and model of light used to conduct surveys: Western Rivers Mighty Max

Were binoculars used for the surveys (circle one)? (YES) NO

Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	100+	H	Adult	N/A	100%
Rana catesbeiana	2	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs, Numerous crayfish, Carp, Raccoon (track) observed.

Other notes, observations, comments, *etc.* Several areas have urban debris. Most suitable habitat of this reach appears to be marsh-like area after Madonna Road undercrossing. Creek bordered by residential in this section.

* Water levels have dropped 10"-12" since last week.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/14/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO Creek Los Osos Valley Rd to Higuera St Bridge.
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd/Hwy 101 Interchange
Brief description of proposed action:
LOVR/Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:30 PM **End Time:** 1 AM

Cloud cover: Fog **Precipitation:** 0

Air Temperature: 73°F **Water Temperature:** 71°F

Wind Speed: Negligible **Visibility Conditions:** Good

Moon phase: Just Past full **Humidity:** _____

Description of weather conditions: Mild

Brand name and model of light used to conduct surveys: Maglite 4-D

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton/Orion 8x42

2nd Nightime
LOUR → Higuera St Bridge
6/14/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Bullfrog	2	O	Larvae	No legs	100%
Pseudacris	Many	H	Adult		100%
Western Pond Turtle	1	O	Adult	4" diam	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Few Bullfrogs
High Winter flows
Raccoons

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/15/2006 (mm/dd/yyyy)

Survey Biologist: Cohn, Sara (Last name) (first name)

Survey Biologist: Trautman, Vicki (Last name) (first name)

Site Location: San Luis Obispo, Stenner Creek, Prado to LOSR, UTM 1071988E 3903813 N (County, General location name, UTM Coordinates or Lat./Long. or T-R-S) (WGS 84/NAD 83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOSR / US 101 Interchange Improvement
Brief description of proposed action: CRF Survey
Reconstruction of LOS OSOS Valley Road overpass + ~~[illegible]~~ US 101 on/off ramp realignment.

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 2200 **End Time:** 0030 (06/16/2006)

Cloud cover: None **Precipitation:** None

Air Temperature: 63° F **Water Temperature:** 64° F

Wind Speed: no wind in creek **Visibility Conditions:** clear

Moon phase: Waning – 80% **Humidity:** none

Description of weather conditions: clear, bright moon, calm good visibility

Brand name and model of light used to conduct surveys: Western Rivers Night Max

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Orion, Savannah, 10x50

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	1	O	adult		100%
Pseudacris regilla	100s	H	adult	n/a	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrog adults observed in creek. Past surveys in SC Creek recorded crayfish + bullfrog tadpoles

Other notes, observations, comments, *etc.*

Bats were observed foraging above channel.

This stretch of creek has well intact riparian habitat. Creek bottom primarily rocky/gravel. Some pools up to 30" of H_2O. Most of the creek was 4"-12" deep. Debris line shows up to 8' of H_2O during high flows.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/15/2006 (mm/dd/yyyy) Survey Biologist: Lando, Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: San Luis Obispo, Froom Creek, UTM 10 710751E 3902416N (WGS84/NAD 83)
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Los Osos Valley Rd./Highway 101 interchange
Brief description of proposed action:
Expansion of interchange to accommodate increasing traffic.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:45 p.m. End Time: 10:00 p.m.

Cloud cover: None Precipitation: None

Air Temperature: 60° F Water Temperature: 60°F

Wind Speed: 0-Slight Visibility Conditions: Clear

Moon phase: Waning - 3/4 Humidity: _____

Description of weather conditions: Clear, warm night occasional slight breeze

Brand name and model of light used to conduct surveys: Western Rivers Mighty Max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	50+	H	Adult	N/A	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: No predators or sign observed.

Other notes, observations, comments, *etc.*

There is very little water in this creek at this time. Water level has dropped 10-12" since last survey (6/8/06). A few shallow (4") pools persist in channel - completely dry 200' west of Calle Joaquin under crossing.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/14/2006 (mm/dd/yyyy)

Survey Biologist: Lanola, Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: San Luis Obispo Co. Treatment ponds, UTM 10711038 E 37026664 N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love / US-101 interchange
Brief description of proposed action:

Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 1:00 a.m. End Time: 1:45 a.m.

Cloud cover: None Precipitation: None

Air Temperature: 53° F Water Temperature: _____

Wind Speed: Slight Visibility Conditions: Clear

Moon phase: Waning - 80% Humidity: _____

Description of weather conditions: Clear - good visibility

Brand name and model of light used to conduct surveys: Western Rivers Mighty MAX

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion Savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	8	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs

Pacific treefrogs not observed this survey.

Other notes, observations, comments, *etc.*

one adult bullfrog in southern pond – all others in concrete "raceways".

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 04/~~22~~ 21/04 (mm/dd/yyyy)

Survey Biologist: Cohn Sara (Last name) (first name)

Survey Biologist: Langle Brooke (Last name) (first name)

Site Location: County SLO Pettumo Creek, UTM 1071072 8E 3904270N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS84/NAD83

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:50 p.m. End Time: 12:00 a.m.

Cloud cover: none Precipitation: none

Air Temperature: 65° F Water Temperature: ~63°

Wind Speed: none Visibility Conditions: clear/dark

Moon phase: waning crescent Humidity:

Description of weather conditions: clear, calm, dark but good visibility

Brand name and model of light used to conduct surveys: Western Rivers mighty mat

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	1	O	Adult		100%
Gambusia affinis	100s	O	minnow/adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs, crayfish, carp

Other notes, observations, comments, *etc.*

Observed pheobe fledglings again
H_2O dropped since yesterday by about 2"

Mosquito fish noted in Perfumo Creek

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/22/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Doubledee (Last name) Rebecca (first name)

Site Location: San Luis Obispo County, SLO Creek Prado Rd to Los Osos Valley Rd
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd / Hwy 101 Interchange
Brief description of proposed action:
LOVR / Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:30 PM **End Time:** 12:30 AM

Cloud cover: Fog **Precipitation:** 0

Air Temperature: 72°F **Water Temperature:** 71°F

Wind Speed: Negligible **Visibility Conditions:** Good

Moon phase: 3rd QTR **Humidity:** _____

Description of weather conditions: Mild

Brand name and model of light used to conduct surveys: Maglite 4-D

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton 8x42

3rd Nightime
Prado Rd → LOVR
6/22/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris	many	H	Adult		100%
Pseudacris	2	O	Adult Amplexis		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/22/2006 (mm/dd/yyyy) Survey Biologist: Wolf (Last name) David (first name)
Survey Biologist: Rebecca (Last name) Doubledee (first name)

Site Location: SLO Co. SLO Creek / Prado Road LOVE section
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).
UTM 1071988E, 2903813N (WGS84/NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVE/101 Interchange
Brief description of proposed action: CRLF Survey

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2200 End Time: 00:30

Cloud cover: Scattered / mainly clear Precipitation: none

Air Temperature: 64° Water Temperature: 67°

Wind Speed: None Visibility Conditions: clear

Moon phase: Waning Crescent Humidity: non

Description of weather conditions: Calm, clear, good visibility

Brand name and model of light used to conduct surveys: mag light

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah 10x50

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Cyprinus carpio	2	O	adult		100%
Oronectes rustica	100s	O	adults		100%
Rana aurosbiana	2	O	adults		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs, crayfish, carp observed during survey

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/22/2006 (mm/dd/yyyy)

Survey Biologist: Cohn Sara (Last name) (first name)

Survey Biologist: Kirschenstein Susan (Last name) (first name)

Site Location: SLO Creek, SLO Co., LOVR / S. Higuera section
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVR / US 101 Interchange
Brief description of proposed action:

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2200 End Time: 00:15

Cloud cover: scattered/mainly clear Precipitation: none

Air Temperature: 64° Water Temperature: 66°

Wind Speed: none Visibility Conditions: clear

Moon phase: Waning crescent Humidity: none

Description of weather conditions: calm, clear, dark, good visibility

Brand name and model of light used to conduct surveys: Western rivers nightsun max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: ORION, SAVANNAH, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	10s	H	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: this reach is mainly fast moving H_2O w/ a few calm pools. Past surveys have shown bullfrog presence, crayfish + carp. These species were not seen during this particular survey.

Other notes, observations, comments, *etc.*

Relatively quiet night. H_2O has dropped approx. 1-3". Pheobes noted along riparia corridor. Well intact habitat, creek bottom cobbles + rocks. Some pools up to 36". Debris line up to 10' during high flows.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/22/2006 (mm/dd/yyyy) Survey Biologist: Cohn Sara (Last name) (first name)
Survey Biologist: Kirschenstein Jason (Last name) (first name)

Site Location: SLO Co. Froom Creek, UTM 1010751E 3902416N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS 84/NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVR/101 Interchange
Brief description of proposed action:
CRLF Surveys

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 5 6 7 8

Begin Time: 00:20 End Time: 00:35

Cloud cover: scattered/mainly clear Precipitation: none

Air Temperature: 63° Water Temperature:_____

Wind Speed: none Visibility Conditions: clear

Moon phase: waning crescent Humidity: non

Description of weather conditions: clear, calm

Brand name and model of light used to conduct surveys: Western rivers, mighty max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
pseudacris regilla	1	O	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Other notes, observations, comments, *etc.*

although 2 small pools exist below Motel 6 parking lot, no frgs were heard or observed in this area. Maintenance activities observed in this area. One treefrog observed near Calle Joaquin + riparian habitat.
Area/creek disturbed + adjacent to roadside

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/21/06 (mm/dd/yyyy)

Survey Biologist: Lande Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: SLO, Treatment Ponds, UTM 1071038E 3902664N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love / US-101 interchange
Brief description of proposed action:
Highway interchange Project

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 12:30a.m. End Time: 1:15a.m.

Cloud cover: high fog Precipitation: —

Air Temperature: 62°F Water Temperature: _____

Wind Speed: Slight Visibility Conditions: Clear

Moon phase: Waning Humidity: _____

Description of weather conditions: _____

Brand name and model of light used to conduct surveys: Western Rivers Mighty mite

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion Savannah 8X42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	11	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs

Other notes, observations, comments, *etc.*

Two bull frogs in southern pond; others in raceways. Northern Pond completely dry - scanned, but no Amphibs observed

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/28/2006 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: Scotti, Norman (Last name) (first name)

Site Location: San Luis Obispo, Prefumo Creek, 10 710728E 3904270N UTM NAD83
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOVR/US-101 interchange
Brief description of proposed action:
Highway interchange expansion.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:45 pm End Time: 12:50 a.m.

Cloud cover: High fog Precipitation: None

Air Temperature: 57°-60° F Water Temperature: 62° F

Wind Speed: 0-Slight Visibility Conditions: Good

Moon phase: Waxing Crescent Humidity:

Description of weather conditions: Calm, clear night @ creek; High fog layer

Brand name and model of light used to conduct surveys: Western Rivers Mity Max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Sawtooth, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	100 (+)	H/O	Adult + tadpoles	—	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: None observed this survey period.

Other notes, observations, comments, *etc.*
one 12-inch steelhead observed. Water level has continued to drop (by a couple of inches) and small side pools and channels have mostly dried up (few shallow pools remain).

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/29/2006 (mm/dd/yyyy) Survey Biologist: Langle (Last name) Brooke (first name)
Survey Biologist: Cohn (Last name) Sara (first name)

Site Location: SLO Co. SLO Creek (Prado to Love)
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 22:00 End Time: 23:45

Cloud cover: clear Precipitation: none

Air Temperature: 56-59° Water Temperature: 65°

Wind Speed: non Visibility Conditions: clear

Moon phase: waxing crescent Humidity: none

Description of weather conditions: good visibility, warm mist, clear,

Brand name and model of light used to conduct surveys: western rivers nightmax

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: orion savannah 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	2	O	tadpoles		100%
Pseudacris regilla	100's	H	adult		100%
Gambusia affinis	20s	O	adult		100%
Rhinichthys osculus	10s	O	adult		100%
Cyprinus carpio	1	O	adult		100%
Orconectes rustica	2	O	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs - fast water, not many deep pools, Gambusia

Other notes, observations, comments, *etc.*

H_2O has dropped approx 2'. Tadpoles observed by no adult bullfrogs.

Rocky/cobbly substrate - open canopy over most parts of creek. Trash debris noted @ ~50'.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 06/29/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO Creek Los Osos Valley Rd to Higuera St Bridge
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S').

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd / Hwy 101 Interchange
Brief description of proposed action:
LOVR / Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:30 pm **End Time:** 12:30 AM

Cloud cover: Clear **Precipitation:** 0

Air Temperature: 73°F **Water Temperature:** 71°F

Wind Speed: Negligible **Visibility Conditions:** Good

Moon phase: Just Past New Moon **Humidity:** _____

Description of weather conditions: mild

Brand name and model of light used to conduct surveys: Maglite 4-D

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton Orion 8x42

4th Nightime
LOUR → Higuera St Bdy
6/29/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Bullfrog	1	O	Adult	small	100%
Pseudacris	many	H	Adult		100%
Western Pond Turtle	1	O	Adult	6+" diam	100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Few Bullfrogs
Raccoons
High winter flows

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/29/06 (mm/dd/yyyy)

Survey Biologist: Laurie Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: SLO, Froom Creek UTM 1071075 1E 3762416N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: LOUR/US-101 interchange
Brief description of proposed action:

Highway expansion project

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:45 pm. End Time: 10:10 pm

Cloud cover: — Precipitation: —

Air Temperature: 73°F Water Temperature:

Wind Speed: slight Visibility Conditions: clear

Moon phase: New Humidity:

Description of weather conditions: calm, clear

Brand name and model of light used to conduct surveys: Western Rivers Mighty max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah 8X42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris regilla	30+	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Other notes, observations, comments, *etc.*

Continuing to dry.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 06/29/06 (mm/dd/yyyy)

Survey Biologist: Lande Brooke (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: SLO Treatment Pond S UTM 1071103 E 3762664 N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 10:20 pm End Time: 11:00 pm

Cloud cover: — Precipitation: —

Air Temperature: 72°F Water Temperature: _____

Wind Speed: slight Visibility Conditions: clear

Moon phase: New Humidity: _____

Description of weather conditions: warm, clear

Brand name and model of light used to conduct surveys: Westwinds Mighty Light

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion Savannah 8X42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana Catesbeiana	12	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Bullfrogs

Other notes, observations, comments, *etc.*
Water in southern pond down a bit. One bullfrog observed in southern pond – others in raceways.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/03/06 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: Cohn, Sara (Last name) (first name)

Site Location: County SLO, Perfumo Creek, UTM 10710728E 3904270N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS84 (NAD83))

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:

Highway interchange expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 5 6 7 8

Begin Time: 12:00 pm End Time: 2:00 pm

Cloud cover: none Precipitation: none

Air Temperature: 70° Water Temperature: 63°

Wind Speed: none Visibility Conditions: Clear

Moon phase: none Humidity: 80

Description of weather conditions: warm, clear, sunny day

Brand name and model of light used to conduct surveys: n/a

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbiana	1	O	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs, crayfish, carp, channelized creek, limited ponding areas

Other notes, observations, comments, *etc.*

water has significantly receded although deeper pools still @ or above 40".
Upper reach @ Madonna road completely dry.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.

California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 07/26/2006 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: Hosseinion, NAMAT (Last name) (first name)

Site Location: San Luis Obispo, San Luis Obispo Creek (Prado to Love (1/4 mile upstream of Love))
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US 101 interchange
Brief description of proposed action:
Highway interchange expansion.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 8:00 p.m. End Time: 8:30 p.m.

Cloud cover: None Precipitation: None

Air Temperature: 67°F Water Temperature: 64°F

Wind Speed: Slight breeze Visibility Conditions: Clear

Moon phase: _____ Humidity: _____

Description of weather conditions: _____

Brand name and model of light used to conduct surveys: Western Rivers Mighty Max

Were binoculars used for the surveys (circle one)? YES NO

Brand, model, and power of binoculars: Orion, Sawanash 8 x 42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

_____

_____

_____

_____

Other notes, observations, comments, *etc.*

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (Date) _____ (Biologist)

Date of Survey: 07/28/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO Creek Los Osos Valley Rd to Higuera St Brdg
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd / Hwy 101 Interchange
Brief description of proposed action:
LOVR / Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2 PM **End Time:** 5 PM

Cloud cover: 80% High Clouds **Precipitation:** 0

Air Temperature: 78°F **Water Temperature:** 71°F

Wind Speed: 0-5 mph **Visibility Conditions:** Good

Moon phase: Just Past New Moon **Humidity:** Subtropical Conditions

Description of weather conditions: Mild + Humid

Brand name and model of light used to conduct surveys: _____

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Braunton/Orion 8x42

2nd Daytime
LOVR → Higuera St Bridge
7/28/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Pseudacris	1	O	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: High Winter flows

Other notes, observations, comments, *etc.*

1/4 of Prado section also done - last surveyors ran out of daylight.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/03/04 (mm/dd/yyyy)

Survey Biologist: Cohn, Sara (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: County SLO, Froom Creek, 1071075 E 3902416 N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS 84/NAD83)

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/US-101 interchange
Brief description of proposed action:
Highway expansion

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 2:00 pm End Time: 2:30 pm

Cloud cover: Clear Precipitation: none

Air Temperature: 70° Water Temperature: 63°

Wind Speed: none 8 Visibility Conditions: Clear

Moon phase: none Humidity: none

Description of weather conditions: clear, sunny, warm

Brand name and model of light used to conduct surveys: N/a

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Savannah, 18 x 42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
—					

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Other notes, observations, comments, *etc.*

Water levels ~~[illegible]~~ same, part of creek is being filled due to nearby de-watering activities.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/03/06 (mm/dd/yyyy)

Survey Biologist: Cohn, Sara (Last name) (first name)

Survey Biologist: _____ (Last name) (first name)

Site Location: SLO Co. Waste water treatment pond UTM 10 711038E 3906664N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: LOVR/US-101 interchange
Brief description of proposed action:

Highway interchange expansion

Type of Survey (circle one): (DAY) **NIGHT** **BREEDING** (NON-BREEDING)

Survey number (circle one): (1) 2 3 4 5 6 7 8

Begin Time: 2:30 pm **End Time:** 3:00 pm

Cloud cover: clear **Precipitation:** none

Air Temperature: 70° **Water Temperature:** _____

Wind Speed: slight **Visibility Conditions:** clear

Moon phase: none **Humidity:** _____

Description of weather conditions: warm, sunny, breeze began in afternoon

Brand name and model of light used to conduct surveys: Na

Were binoculars used for the surveys (circle one)? (YES) **NO**
Brand, model, and power of binoculars: Orion, Savannah, 8 x 42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana aurora	7	O	adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs, one pond drained due to maintenance activities.

Other notes, observations, comments, *etc.*
4 Southwestern pond turtles (Actinemys marmorata) were observed in the raceways.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 08/03/06 (mm/dd/yyyy)

Survey Biologist: Langle Brooke (Last name) (first name)

Survey Biologist: Osna Sara (Last name) (first name)

Site Location: SLO Co. Perfumo Creek, UTM 1071 0728E 3904270N (County, General location name, UTM Coordinates or Lat./Long. or T-R-S). (WGS84/NAD83)

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: LOUR/US-101 interchange
Brief description of proposed action:
Highway expansion project

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:00 pm **End Time:** 11:15 pm

Cloud cover: scattered clouds **Precipitation:** none

Air Temperature: 58° **Water Temperature:** 63°

Wind Speed: slight breeze **Visibility Conditions:** good

Moon phase: waxing gibbous **Humidity:** none

Description of weather conditions: cool, breezy, evening

Brand name and model of light used to conduct surveys: western rivers mighty max

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: orion, savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: bullfrogs have been noted in past survey events, vandalized barks, high flows

Other notes, observations, comments, *etc.*

water has receded significantly - approx 12". Upper reach dry @ Madonna Road. Carp, crayfish still observed. Steelhead observed as well.

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 07/26/2010 (mm/dd/yyyy)

Survey Biologist: Langle, Brooke (Last name) (first name)

Survey Biologist: Hosseinioni, Namat (Last name) (first name)

Site Location: Prado to Lowe San Luis Obispo, San Luis Obispo Creek
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Lowe/Highway 101 interchange
Brief description of proposed action:
Highway interchange expansion.

Type of Survey (circle one): DAY NIGHT BREEDING NON-BREEDING

Survey number (circle one): 1 2 3 4 5 6 7 8

Begin Time: 9:00 p.m. End Time: 11:00 p.m.

Cloud cover: None Precipitation: None

Air Temperature: _____ Water Temperature: _____

Wind Speed: Slight Visibility Conditions: Clear

Moon phase: _____ Humidity: _____

Description of weather conditions: Clear

Brand name and model of light used to conduct surveys: Western Rivers Mighty Max

Were binoculars used for the surveys (circle one)? YES NO
Brand, model, and power of binoculars: Orion, Sakanoh + 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	2	O	1- Juvenile 1- Adult	Medium Large	100%
Pseudacris regilla	+/- 50	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Evidence of raccoons (prints) & bullfrogs.

Other notes, observations, comments, *etc.*

Picked up more bullfrogs than past surveys. Very large bullfrog in deep pool near confluence of creeks & San Luis Obispo Creek.

Necessary Attachments:

1. All field notes and other supporting documents
2. Site photographs
3. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____ (FWS Field Office) _____ (date) _____ (biologist)

Date of Survey: 07/25/2006 (mm/dd/yyyy) **Survey Biologist:** WOLFF (Last name) David (first name)
Survey Biologist: Kirschenstein (Last name) Jason (first name)

Site Location: San Luis Obispo County, SLO Creek Los Osos Valley Rd to Highway 1 Bridge.
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Los Osos Valley Rd/Hwy 101 Interchange
Brief description of proposed action:
LOVR/Hwy 101 Interchange Improvements

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:00 PM **End Time:** 11:30 PM

Cloud cover: Clear **Precipitation:** 0

Air Temperature: 73°F **Water Temperature:** 71°F

Wind Speed: Negligible **Visibility Conditions:** Good

Moon phase: New moon **Humidity:** _____

Description of weather conditions: Mild

Brand name and model of light used to conduct surveys: Maglite 4-D

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Bounton/Orion 8x42

5th Nightime
LOVR → Higuera St Bridg
7/25/06

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Bullfrog	1	O	Adult	small	100%
Pseudacris	many	H	Adult		100%

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Few Bullfrog
Raccoon
High Winter flows

Other notes, observations, comments, *etc.*

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by _____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/03/04 (mm/dd/yyyy)

Survey Biologist: Langle Brooke (Last name) (first name)

Survey Biologist: Cohn, Sara (Last name) (first name)

Site Location: SO Co. Froom Creek, 1071075 E 3902416 N
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).

****ATTACH A MAP** (include habitat types, important features, and species locations)**

Proposed project name: Love / US-101 interchange
Brief description of proposed action:
Highway interchange expansion

Type of Survey (circle one): **DAY NIGHT** **BREEDING NON-BREEDING**

Survey number (circle one): **1 2 3 4 5 6 7 8**

Begin Time: 11:15 pm **End Time:** 11:40 pm

Cloud cover: scattered clouds **Precipitation:** none

Air Temperature: 58° **Water Temperature:** 62°

Wind Speed: breezy, slight **Visibility Conditions:** good

Moon phase: waxing gibbous **Humidity:** none

Description of weather conditions: cool, breezy, evening

Brand name and model of light used to conduct surveys: western rivers mighty max

Were binoculars used for the surveys (circle one)? **YES NO**
Brand, model, and power of binoculars: orion, Savannah, 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification

Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: _____

Other notes, observations, comments, *etc.*

dewatering activities nearby has raised H_2O levels slightly

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

Appendix E.
California Red-legged Frog Survey Data Sheet

Survey results reviewed by_____ _____ _____
(FWS Field Office) (date) (biologist)

Date of Survey: 08/07/2006 (mm/dd/yyyy) **Survey Biologist:** Lanale Brooke (Last name) (first name)
Confirmation: 08/10/2006 **Survey Biologist:** Kirschenstein, Jason (Last name) (first name)

Site Location: San Luis Obispo Treatment pond
(County, General location name, UTM Coordinates or Lat./Long. or T-R-S).
UTM: 10 711016E 3705674N (NAD83)
ATTACH A MAP (include habitat types, important features, and species locations)

Proposed project name: Love/Highway 101 interchange
Brief description of proposed action:
Highway interchange expansion.

Type of Survey (circle one): **DAY** **NIGHT** **BREEDING** **NON-BREEDING**

Survey number (circle one): **1** **2** **3** **4** **5** **6** **7** **8**

Begin Time: 9:45 p.m. **End Time:** 11:45 p.m.

Cloud cover: Partial-fog **Precipitation:** n/a

Air Temperature: 64° F **Water Temperature:**

Wind Speed: Slight **Visibility Conditions:** Clear

Moon phase: Full - 100% **Humidity:**

Description of weather conditions: Warm, clear night
Partly fog (Hills)

Brand name and model of light used to conduct surveys: Western Rivers Mighty MAX

Were binoculars used for the surveys (circle one)? **YES** **NO**
Brand, model, and power of binoculars: Orion, [illegible] 8x42

Appendix E.
California Red-legged Frog Survey Data Sheet

AMPHIBIAN OBSERVATIONS

Species	# of indiv.	Observed (O) Heard (H)	Life Stages	Size Class	Certainty of Identification
Rana catesbeiana	13	O/H	Adult		100%
Rana aurora draytonii					
	1	O	Juvenile		90%
R. aurora draytonii	1	O	Adult		100%

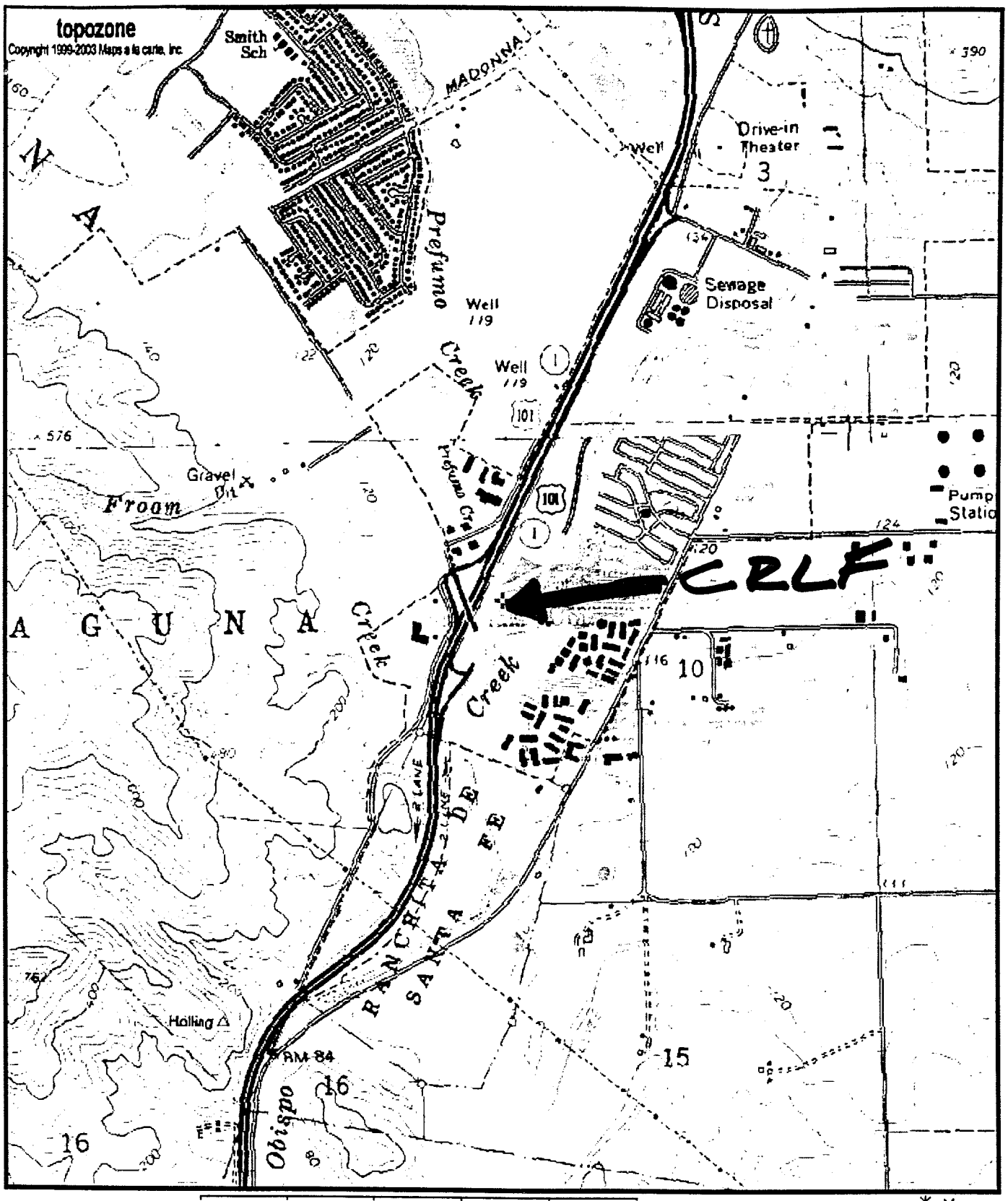
Describe potential threats to California red-legged frogs observed, including non-native and native predators such as fish, bullfrogs, and raccoons: Numerous Adult bullfrogs; Limited cover in concrete channels may make avian predation a reasonable threat. Unclear if frogs can leave concrete channels.

Other notes, observations, comments, *etc.*

Some difficulty in identification of CRLF due to vegetative cover & position of frog. However, dorsolateral folds evident, confirming ID.
*Confirmation 8/10/06 - observed Juvenile & Adult.
*Digital Photo taken of adult. 8/10/06

Necessary Attachments:

4. All field notes and other supporting documents
5. Site photographs
6. Maps with important habitat features and species locations

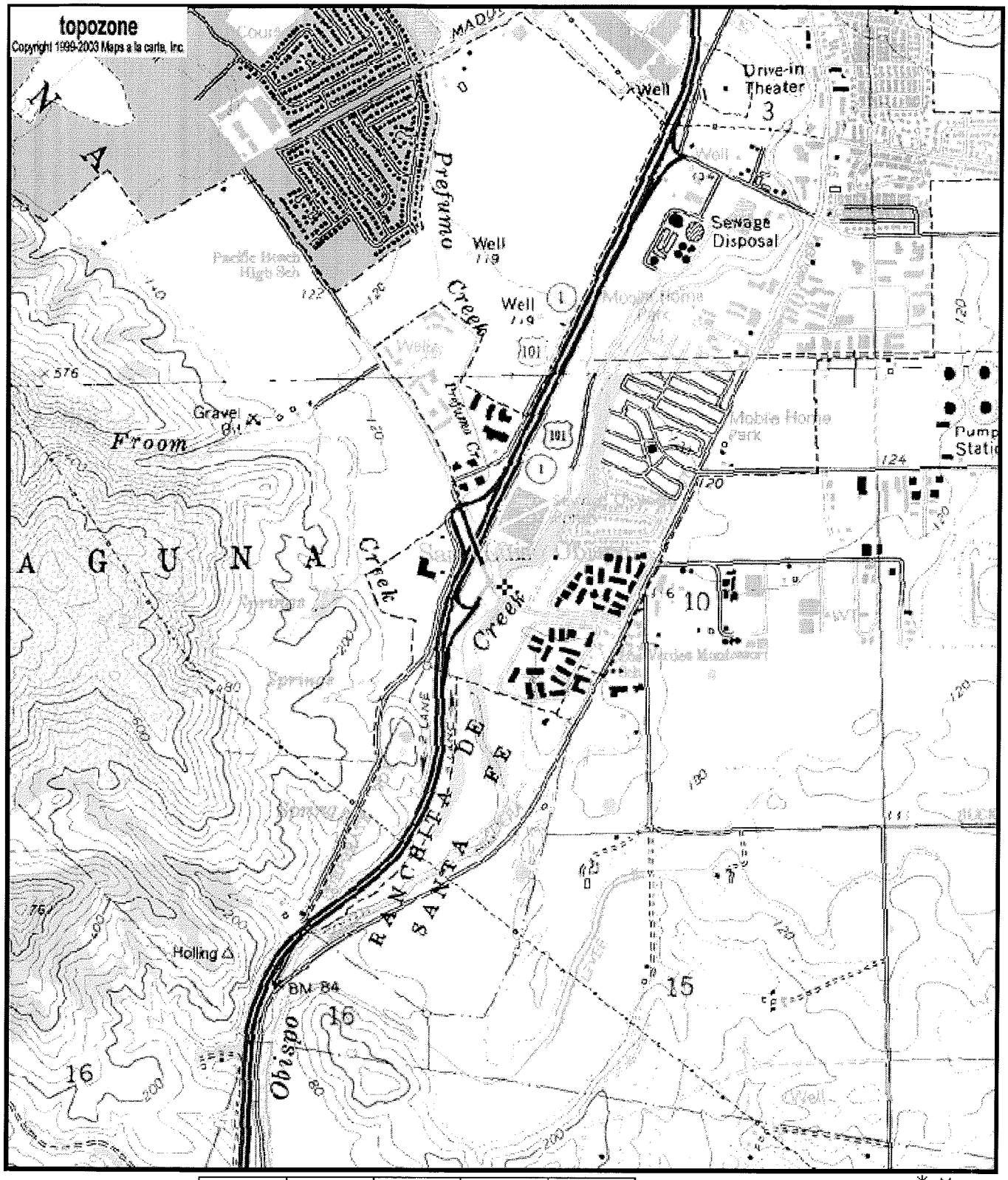


0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

Map center is UTM 10 711016E 3902674N (WGS84/NAD83)
PISMO BEACH quadrangle
Projection is UTM Zone 10 NAD83 Datum

M=14.225
G=1.339



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

Map center is UTM 10 711000E 3902497N (WGS84/NAD83)

PISMO BEACH quadrangle

Projection is UTM Zone 10 NAD83 Datum

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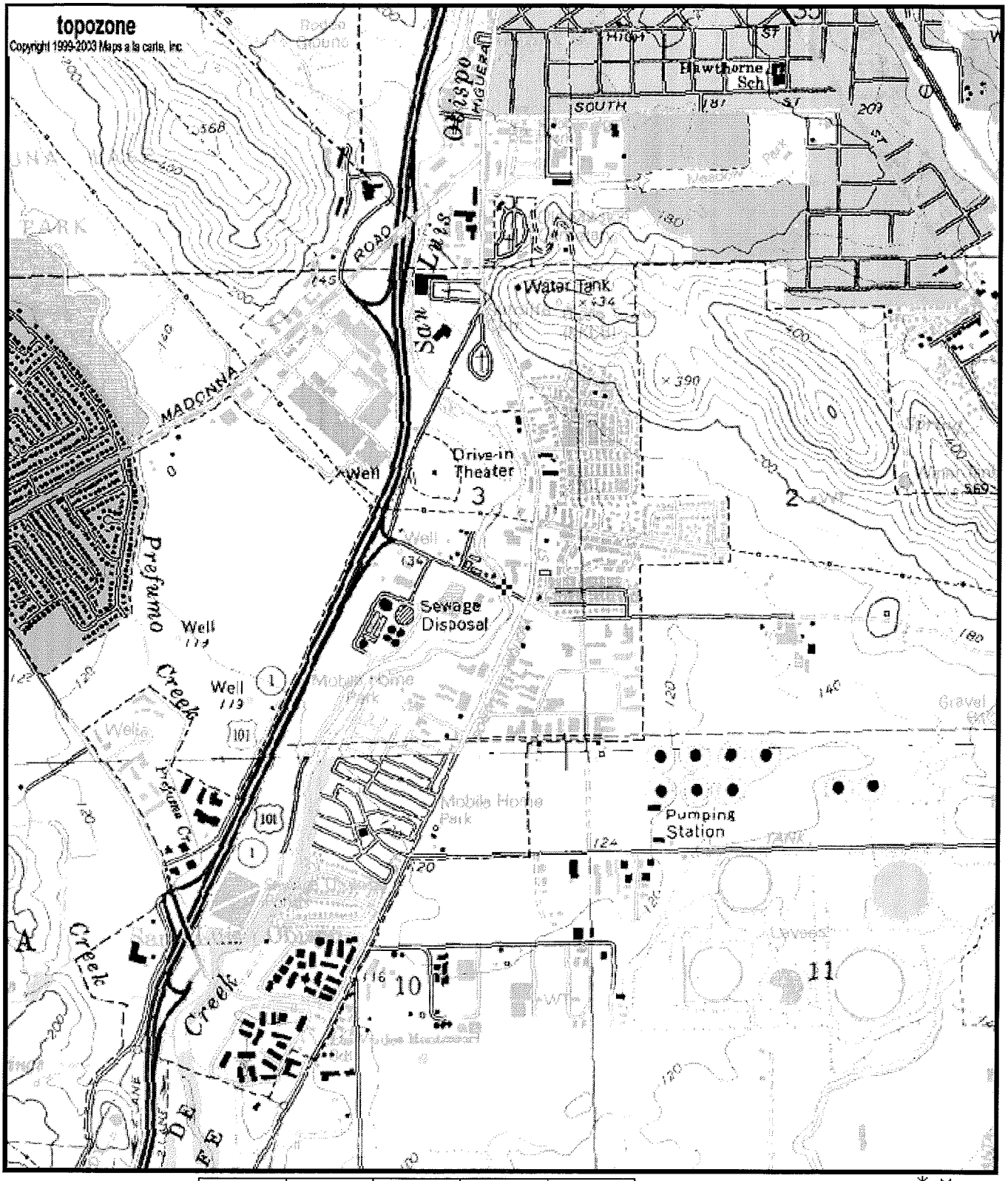
G=1.339



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

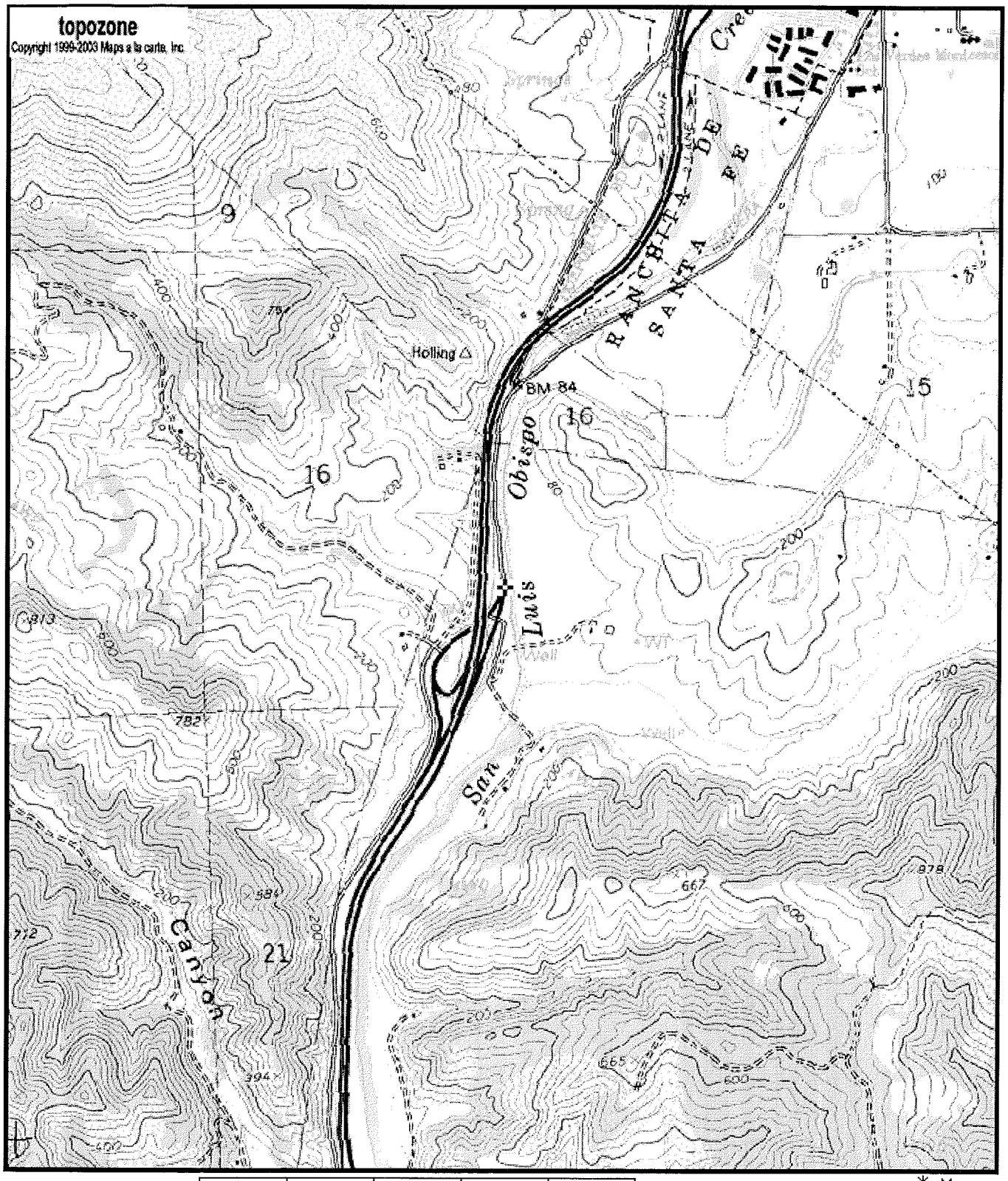
Map center is UTM 10 711988E 3903813N (WGS84/NAD83)

SAN LUIS OBISPO quadrangle

Projection is UTM Zone 10 NAD83 Datum

M=14.226

G=1.346



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

Map center is UTM 10 710195E 3900434N (WGS84/NAD83)

PISMO BEACH quadrangle

Projection is UTM Zone 10 NAD83 Datum

M=14.221

G=1.333

APPENDIX D: BIOLOGISTS RESUMES

REBECCA DOUBLEDEE

ASSISTANT WILDLIFE BIOLOGIST
HERPETOLOGIST

EXPERTISE

Herpetology
Aquatic Ecology
Theoretical Ecology
Conservation Biology

EDUCATION

M.A., Integrative Biology, 2004, University of California, Berkeley, CA
B.S., Zoology, 2000, University of California, Santa Barbara, CA

PROFESSIONAL EXPERIENCE

Assistant Wildlife Biologist/Herpetologist, LSA Associates Inc. Pt Richmond, CA, August 2004 to Present.

Wildlife Biology Intern, East Bay Regional Park District, Oakland, CA, May 2004 to August 2004

Independent Wildlife Biologist, Berkeley, CA, March 2004 to August 2004.

Amphibian Declines Specialist, AmphibiaWeb, University of California, Berkeley, CA, May 2003 to May 2004.

Graduate Student Instructor, University of California, Berkeley, CA, August 2002 to May 2003

Graduate Student Researcher, University of California, Berkeley, CA, May 2002 to August 2002

Research Associate, University of California, Santa Barbara, CA, May 2001 to August 2001

Biological Technician, Pacific Southwest Research Station, U.S. Forest Service, Albany, CA, June 2000-Oct 2000.

Teaching Assistant, University of California, Santa Barbara, CA, March 2000 to June 2000.

Biological Technician, Santa Barbara Museum of Natural History, Santa Barbara, CA, June 1999 to January 2000.

Volunteer, Santa Barbara White-tailed Kite Monitoring Program, Santa Barbara, CA, August 1999 to April 2000.
Curatorial Assistant, Museum of Systematics and Ecology, University of California, Santa Barbara, CA December 1998 to April 1999.

Biological Technician, University of California, Santa Barbara, CA, November 1997 to October 1998.

SURVEY EXPERIENCE

California Tiger Salamanders (*Ambystoma californiense*)

East Bay Regional Park District, Alameda and Contra Costa Counties, CA. From May 2004 to August 2004, Ms. Doubledee conducted pond surveys for the East Bay Regional Park District. The East Bay Regional Park District encompasses over 95,000 acres of wildlife habitat spread throughout Alameda and Contra Costa counties. In total, she surveyed 182 ponds on East Bay Regional Park Land. Out of those 182 ponds, 33 ponds contained California tiger salamanders. All surveys were conducted during the day using the methods of bank-side observations, seining, dip netting and hand capture. California tiger salamander larvae and newly metamorphosed juveniles were captured using seines and dip nets. During the course of this project, Ms. Doubledee handled over 3,000 California tiger salamander larvae and newly metamorphosed juveniles, several hundred California red-legged frog tadpoles, juveniles and adults, thousands of California newt and Rough-skinned newt adults and larvae, thousands of Pacific tree-frog and western toad tadpoles and several hundred bullfrog tadpoles.

Alameda and Contra Costa Counties, CA. From May 2003 to September 2003, Ms. Doubledee conducted pond surveys for amphibians and aquatic invertebrates using dip nets, bank side observations and unbaited minnow traps in Del Valle, Pleasanton Ridge and Diablo Foothills Regional Parks, Walnut Creek Open Space and East Bay Municipal Utility District Land. During these surveys she trapped and handled over 50 California tiger salamander larvae, over 100 California red-legged frog tadpoles, hundreds of California newt, Pacific tree-frog and western toad larvae and several hundred bullfrog adults and tadpoles.

California red-legged frogs (*Rana aurora draytonii*)

San Francisco County, CA. In February 2004, Ms. Doubledee conducted night surveys for adult frogs at the San Francisco Airport with Sue Orloff. She also assisted Sue with tadpole trapping in June 2004.

Santa Barbara County, CA. From June 1999 to January 2000, under the supervision of Susan Christopher, a graduate student at the University of California, Santa Barbara, Ms. Doubledee studied the effects of a recent bullfrog invasion on California red-legged frogs in wetlands on Vandenberg Air Force Base, Santa Barbara County, CA. She studied the foraging ecology of bullfrogs and California red-legged frogs through direct observations using binoculars and night-vision goggles and estimated relative abundance and microhabitat use of the two tadpole species using unbaited minnow traps.

From November 1997 to October 1998, Ms. Doubledee assisted Susan Christopher with an on-going study of the population structure and movement patterns of California red-legged frogs on Vandenberg Air Force Base, Santa Barbara, county, CA. She conducted mark-recapture surveys for adults and metamorphs. Adults were caught by hand, weighed in plastic bags using a Pesola spring scale. There snout to vent length was measured and PIT tags were inserted into the dorsal lymph sac in the same way as described above. She also clipped the tip of the fourth hind toe, midway between the 2nd and 3rd phalange using standard toe clippers dipped in ethanol between each use.

Metamorphosing California red-legged frogs were caught by hand but were not individually marked. Instead, a unique toe clip combination was assigned to each pond and recently metamorphosed individuals were marked to the pond level.

Ms. Doubledee also assisted Ms. Christopher with a pitfall trap study at two dune swale ponds on Vandenberg Air Force Base. She regularly set and checked pitfall traps. If a frog was captured in a trap, it was weighed in a plastic bag using a Pesola spring scale, the snout to vent length was recorded and a PIT tag was inserted if it was an adult or a specific combination of toes were clipped if it was a juvenile to identifying it to the pond level.

Foothill yellow-legged frogs (*Rana boylii*)

Mendocino County. In 2002, Ms. Doubledee assisted Dr. Sarah Kupferberg with foothill yellow-legged frog egg mass surveys along portions of the South Fork Eel River, Mendocino County, CA. She also studied the distribution and foraging behavior of foothill yellow-legged frog tadpoles in field enclosures and at egg mass sites along the S Fork Eel River on the Angelo Coast Range Reserve. The purpose of the study was to examine the effects of fine sediment loading on the foraging ecology of tadpoles. To conduct this study, Ms. Doubledee was authorized to collect tadpoles from the S Fork Eel River, Mendocino County, CA and the Rice Fork Eel River, Lake County, CA.

Mountain yellow-legged frogs *(Rana muscosa*)

Kings Canyon National Park, CA. From June 2000 to October 2000, Ms. Doubledee worked with Karen Pope and Dr. Kathleen Mathews studying the movement patterns and population structure of mountain yellow-legged frogs, Rana muscosa, in Dusy Basin, Kings Canyon National Park, CA. She conducted observational surveys for egg masses and tadpoles and PIT tag surveys for adult frogs. PIT tag surveys consisted of catching adult frogs using dip nets, weighing frogs in plastic bags using Pesola spring scales, and measuring frog snout to vent length. She inserted PIT tags into the dorsal lymph sac by making a posteriorly directed nick into the skin anterolateral to the sacrum; the PIT was then inserted into the opening.

PERMITS

Section 10(a) Permit for Handling/Trapping/Sampling Federally Listed California Red-Legged Frogs.

PROFESSIONAL AFFILIATIONS

Ecological Society of America
Society for Conservation Biology
The Wildlife Society
American Society of Ichthyology and Herpetology
Society for the Study of Amphibians and Reptiles
Declining Amphibian Population Task Force

PUBLICATIONS

Doubledee, R.A, E.B. Muller and R.M. Nisbet. 2003. Bullfrogs, disturbance regimes and the persistence of California red-legged frogs. Journal of Wildlife Management 67(2):424–438

PRESENTATIONS

Doubledee, Rebecca A., Steve Foreman, Greg Gallaugher and Lori Banister. 2006. Developing a Conservation Strategy and an Adaptive Management and Monitoring Program for the Solano Habitat Conservation Plan. Annual Conference of the Wildlife Society Western Section. Sacramento, Ca. February 2006.

Doubledee, R A, T Tunstall, V T Vredenburg, J Gross, M J Mahoney and D B Wake. AmphibiaWeb: An Information System for Amphibian Conservation Biology. Joint Meeting of Ichthyologists and Herpetologists. Norman, Ok. May, 2004.

Doubledee, R A. The role of predation and habitat variation in the coexistence versus the extinction of the California red-legged frog (Rana aurora draytonii) after a bullfrog (Rana catesbeiana) invasion. Annual Conference of the Wildlife Society Western Section. Riverside, Ca. January 2000.

TIMOTHY E. LACY

ASSOCIATE
WILDLIFE BIOLOGIST

EXPERTISE

Endangered and Threatened Species
Wetland and Terrestrial Ecology
Natural Resource Management
Biological Impact Assessment and Mitigation

EDUCATION

M.A., Biological Sciences, 1991, Humboldt State University, Arcata, CA
B.S., Biological Sciences, 1982, University of California, Davis, CA

PROFESSIONAL EXPERIENCE

Associate/Wildlife Biologist, LSA Associates, Inc. Pt. Richmond, CA, August 2002 to present.
Project Manager/Wildlife Biologist, LSA Associates, Inc. Pt. Richmond, CA, April 1998 to August 2002.
Independent Wildlife Biologist, Sonoma, CA, January 1998 to April 1998.
Senior Wildlife Biologist, Resource Management International, Inc. (RMI), San Rafael, CA, 1995-January 1998.
Wildlife Biologist, Western Ecological Services Company, Inc. (WESCO), San Rafael, CA, 1990-1995.
Scientific Aide, Ocean Salmon Project, California Department of Fish and Game, Sacramento, CA, February 1990-April 1990.
Lecturer, Biological Sciences, Humboldt State University, Arcata, CA, September 1984-June 1989.
Museum Assistant, Humboldt State University Vertebrate Museum, Arcata, CA, 1984-1989.

PROFESSIONAL PROJECT EXPERIENCE

Wildlife Surveys and Monitoring

Conducted night time survey for California red-legged frogs in San Luis Obispo Creek, San Luis Obispo, CA. Surveyed approximately 1 mile reach of creek.

Carried out surveys to identify California red-legged frogs at a proposed golf course and residential development in Solano County. Identified locations supporting frogs, breeding areas, and potential expansion areas. Developed measures to protect the frogs during residential, wetland, and golf course construction and golf course maintenance and operation.

Responsible for identifying, capturing, and relocating California red-legged frogs from ponds at a site in Solano County where dredging operations were occurring. Relocated frogs to other suitable ponds on the site.

Served as a monitoring biologist during dredging operations near the San Francisco International Airport in San Mateo County. The channels supported populations of California red-legged frogs and San Francisco garter snakes. Surveyed work areas and access roads, identified frogs and snakes in the work area and captured and moved snakes out the work area. Monitoring required work close to dredging equipment.

Surveyed for California red-legged frogs at a proposed development site in Half Moon Bay, San Mateo County. Conducted protocol-level daytime and nighttime surveys for frogs on the site.

Conducted monitoring surveys for California red-legged frogs at a creek in San Luis Obispo County. Conduced pre-activity survey for frogs and monitored work area during ground disturbing activities in the creek.

Conducted annual monitoring of California tiger salamanders at two sites in Santa Barbara County. Captured larvae and estimated relative population sizes. Conducted similar surveys in Solano, Sonoma, Alameda, and Contra Costa Counties.

Handled numerous amphibians including California red-legged frogs, Pacific chorus frogs, tailed frogs, California tiger salamanders, California and rough skinned newts, ensatinas, Pacific giant salamanders, and slender salamanders at various sites throughout California. All specimens were captured for identification or teaching purposes and returned to the site of capture unharmed.

Conducted pre-construction surveys and construction monitoring at the Safeway/Patterson Pass Business Park site in western San Joaquin County. Tasks included implementing protection measures for San Joaquin kit fox as detailed in the biological opinion for the site, conducting clearance surveys prior to initiation of construction in undisturbed areas, coordinating construction activities and compliance surveys with construction personnel, working with construction supervisors to implement protection measures, and monitoring compliance with the kit fox protection measures throughout the grading, road building, and warehouse construction. Reported the results of the compliance inspections to the Fish and Wildlife Service monthly.

Wildlife Studies

Conducted extensive surveys for special-status wildlife at a proposed gravel mining expansion site in Kern County. These survey involved surveys for San Joaquin kit fox (nocturnal, transect, scent station, and photo station), trapping surveys for small mammals, and transect surveys for blunt-nosed leopard lizards. Submitted the results of the surveys to the Fish and Wildlife Service and the Department of Fish and Game for their approval to allow limited mining operations pending completion of a habitat conservation plan for the site. Conducted pre-construction surveys for kit fox in the limited mining areas and verified compliance with the protection measures.

Carried out extensive surveys of birds, mammals, amphibians, and reptiles for the proposed Bear Butte pump-storage reservoir in the Sierra Nevada Mountains of Fresno County. Characterized

habitats within the proposed inundation area and transmission line corridors using standardized measures of vegetation structure.

Managed and conducted field surveys to determine the occurrence of special-status wildlife species over 1,000 acres at McClellan Air Force Base (Sacramento County) and its associated off-base facilities in Sacramento, Placer, and Yolo counties. Carried out a series of surveys for California tiger salamander, western spadefoot toad, California red-legged frog, Swainson's hawk, burrowing owl, loggerhead shrike, vernal pool fairy shrimp, vernal pool tadpole shrimp, and California linderiella.

Conducted daytime and nighttime surveys for California tiger salamanders in Sonoma, Solano, Contra Costa, Alameda, and Santa Barbara Counties. Surveys included visual encounter surveys and larval surveys.

Project Management

Served as project manager on numerous wildlife studies during the past 16 years. Investigations focused on species ranging from fairy shrimp and tadpole shrimp, to California red-legged frogs and California tiger salamanders, to San Joaquin kit foxes and salt marsh harvest mice. Responsibilities included development of study plans and budgets, coordination between agency personnel and clients, supervision of field staff, implementation of survey methods and gathering of field data, analysis of data, assessment of impacts and development of mitigation measures, and writing of reports.

Served as Technical Coordinator and Wildlife Task Leader for the Geysers Recharge Project in Sonoma County, California. As Wildlife Task Leader, managed and conducted surveys for special-status wildlife along the 41-mile pipeline route, wrote the Biological Assessment as part of the Section 7 consultation, and designed and implemented monitoring surveys of wildlife resources along the pipeline alignment. As Technical Coordinator, responsible for reviewing variance requests and coordinating the technical specialists (i.e., botanists, wetland specialists, wildlife biologists, and cultural resources specialists) field review of the proposed changes to the alignment. Responsible for communicating with the environmental monitors and mobilizing technical specialists as needed during construction.

Environmental Document Preparation

Prepared technical sections of environmental impact reports and environmental impact statements. Contacted agency personnel and other interested parties to determine their concerns. Assessed impact level to wildlife species and their habitats and proposed appropriate mitigation measures. Developed mitigation and protection measures for California tiger salamanders and California red-legged frogs at sites in Alameda, Solano, and Sonoma counties.

Prepared Biological Assessments for U.S. Fish and Wildlife Service regarding impacts to federally threatened and endangered species.

Prepared Caltrans Natural Environment Studies for proposed roadway improvements in Alameda, San Joaquin, and Santa Cruz counties.

Prepared CEQA documents (*e.g.*, initial studies, environmental impact reports, master environmental assessments) for projects throughout Northern California.

Communication and Teaching

Developed informational materials on endangered species and mitigation requirements for distribution to company and construction personnel. Made presentations on endangered species biology and protection measures, including California red-legged frogs, salt marsh harvest mice, San Joaquin kit foxes, and California tiger salamanders to construction personnel.

Provided technical expertise and consultation to clients prior to and during meetings with resource agency personnel.

Participated in public hearings to provide technical expertise in discussion of impacts to wildlife resources.

CERTIFICATIONS/WORKSHOPS/TRAINING

Section 10(a) Permit for Handling/Trapping/Sampling Federally Listed California Red-Legged Frogs (Southern California), California Tiger Salamanders, and Salt Marsh Harvest Mice.
State of California Scientific Collector's Permit

PROFESSIONAL MEMBERSHIPS

American Society of Mammalogists
The Wildlife Society, Past-President, SF Bay Area Chapter (1997)

HONORS

Honor Society of Phi Kappa Phi, U.C. Davis Chapter
Graduation with Honors. University of California, Davis, CA.

ERIC R. LICHTWARDT

WILDLIFE BIOLOGIST/VERTEBRATE ZOOLOGIST
ASSISTANT PROJECT MANAGER

EXPERTISE

Biological Impact Assessment
Biological Resource Surveys
Endangered and Threatened Species

EDUCATION

B.S., Zoology, 1979, San Diego State University, San Diego, CA.
Graduate level classes in biogeography, mammology, and evolutionary biology, 1978-1979, San Diego State University, San Diego, CA.

PROFESSIONAL EXPERIENCE

LSA Associates, Inc. Pt. Richmond, CA, Assistant Project Manager, March 2002 to present.

Merkel & Associates, Santa Rosa and San Diego, CA, Senior Biologist, 2001-present.

Freelance Field Biologist and Environmental Consultant, Montana and Tennessee, 1995-2001.

Independent Researcher, Riverside County, CA, 1994.

Pacific Southwest Biological Services, Inc., San Diego, CA, Senior Biologist, 1993-1995.

Sweetwater Environmental Biologists, San Diego, CA, Senior Ecologist, 1992-1993.

Pacific Southwest Biological Services, Inc., San Diego, CA, Staff Zoologist, 1987-1992.

Independent Biological Consultant, San Diego, CA, 1980-1987.

San Diego Natural History Museum, Department of Herpetology, Curatorial Assistant, San Diego, CA, 1976-1979.

Los Angeles County Museum of Natural History, Department of Vertebrate Paleontology, Research Assistant, Los Angeles, CA, 1972-1975.

PROFESSIONAL PROJECT EXPERIENCE

Mr. Lichtwardt has had extensive field experience over the last 25 years with amphibians in California, Arizona, Montana, and Tennessee. He has field experience with the survey techniques and habitat requirements for a variety of ranid frog species including the mountain yellow-legged frog *(Rana muscosa)*, foothill yellow-legged frog *(R. boylii)*, California red-legged frog *(R. aurora draytoni)*, Cascades frog *(R. cascadae)*, Columbia spotted frog *(R. luteiventris)*, lowland leopard frog *(R. yavapaiensis)* southern leopard frog *(R. septentrionalis)*, northern leopard frog (*R. pipiens*) Chiricahua leopard frog *(R. chiricahuensis)*, green frog *(R. clamitans)* and American bullfrog *(R. catesbeiana)*.

He has conducted field surveys and/or USFWS protocol habitat assessments for the California red-legged frog in Alameda, Contra Costa, Lake, Riverside, San Luis Obispo, San Mateo, Sonoma, and Stanislaus Counties, California. He was approved by the United States Fish and Wildlife Service to monitor and relocate California Red-legged Frogs for the Crowell Ranch project in Alameda Co. (2002), at the California Men's Colony, San Luis Obispo Co. (2002-03), and at the Schaefer Ranch (2005). In addition, Mr. Lichtwardt has over 15 years of field experience with the federally listed arroyo toad *(B. californicus).*

Carlsbad Watershed Unit Management Plan, San Diego Co., California. This project involved drafting a management plan for the Carlsbad Watershed Unit. This watershed unit is composed of seven individual drainage basins ranging in size from 2,175 to 36,050 acres and totaling 135,322 acres. Mr. Lichtwardt authored the sections of the management plan that discussed the physiographic and biological aspects of the seven individual watersheds within the unit. This included discussions concerning the geology, soils, watershed form, drainage pattern, vegetation communities, land use, habitat fragmentation, invasive exotic species, and sensitive species for each drainage basin. KTUA 2001-02

Escondido Research and Technology Center, San Diego Co., California. This project involved a biological survey and impact assessment for a 186-acre site in the City of Escondido. The project consisted of a natural gas-fired power plant and associated facilities, an industrial park, and an off-site water pipeline. The project involved surveys for California Gnatcatchers, rare plants, and wetlands. The project report addressed issues associated with the Multi Habitat Conservation Plan (MHCP) in addition to biological resources and impact analysis. To comply with California Department of Energy requirements, in addition to CEQA, the field studies and report addressed the biological resources within a mile radius of the project site. Eric Lichtwardt served as the lead biologist and primary author of the biological resources and impact report. ENSR International. 2001

East Side Reservoir California Gnatcatcher Study, Riverside County, California. Mr. Lichtwardt conducted an inventory for California Gnatcatchers and a territory mapping study of selected pairs of these birds in the North Hills, adjacent to the site of a proposed reservoir. This six-month study consisted of two phases; 1) mapping the location of resident pairs of gnatcatchers within the 2000-acre study area, and 2) detailed spot mapping of the territories of three individual pairs of birds. The territory mapping involved observing each pair over a ninety-minute period and plotting data on the location of the birds every three minutes on a topographic map of the site. Each of the

three pairs was monitored once per week over an eight-week period. This study provided baseline data on California Gnatcatcher populations within the 10,000-acre Southwest Riverside County Multi-Species Reserve, which is composed, of lands acquired as mitigation for the East Side Reservoir Project. Bill Wagner and the Metropolitan Water District of Southern California. 1994

Sweetwater Urban Runoff Diversion System, San Diego County, California. The project involved an urban runoff diversion system consisting of a 42-inch pipeline, several miles in length, and a pond complex to divert early season storm flows around the Sweetwater Reservoir on the Sweetwater River. Extensive field surveys were conducted to document the status of sensitive species and habitats in the project area that was located primarily within riparian, wetland, and scrub habitats along the river. The study involved a biological constraints analysis, impact assessment, identification and assessment of off-site mitigation areas, revegetation planning, and the preparation of a Biological Assessment for four threatened/endangered species (*i.e.*, Least Bell's Vireo, Southwestern Willow Flycatcher, California Gnatcatcher, and Arroyo Toad) under The Federal Endangered Species Act. Mr. Lichtwardt served as project manager and lead biologist. Sweetwater Authority. 1993-1995.

San Mateo Basin Groundwater Drawdown Project, San Diego County, California. This project consisted of a technical biological study addressing the potential effects of groundwater drawdown to wetland and riparian habitats and associated sensitive species within the San Mateo Basin on Camp Pendleton Marine Corps Base. Sensitive species issues that were involved in this study; included, the federally listed endangered, Arroyo Toad, Light-footed Clapper Rail, California Least Tern, and Least Bell's Vireo. The federally listed threatened California Gnatcatcher and Tidewater Goby, and a number of other sensitive species associated with riparian, wash, and wetland habitats were also addressed. The project involved working closely with hydrologists and preparing a detailed document addressing the potential biological impacts of the project. Tri-Cities Municipal Water District. Mr. Lichtwardt served as the lead zoologist. 1994.

Sycamore Canyon to Rancho Carmel Substation, 69kV Transmission Line Project, San Diego County, California. The first phase of this project involved investigating the status of a number of sensitive animal and plant species, and habitat types along five alternative routes for a proposed 69kV transmission line and preparing the biological section of a environmental assessment. The second phase involved working closely with San Diego Gas and Electric engineers, designers, environmental staff, and construction personnel to design and implement the project in such a manner as to reduce impacts to sensitive biological resources to a level of non-significance. The key environmental issue with this project involved the California Gnatcatcher that is listed as threatened under the U.S. Endangered Species Act. The environmental document for this project was prepared in anticipation of changing California Public Utility Commission rules regarding transmission lines less than 200kV in voltage. Mr. Lichtwardt was the project manager and lead biologist for the biology portion of this project. San Diego Gas and Electric. 1993-1994.

Ecological Assessment of the Superior Valley Gunnery Range, China Lake Naval Weapons Center, San Bernardino County, California. This study consisted of an assessment of the ecological community and habitats surrounding a toxic dumpsite, in the Mojave Desert, where surplus

military ordnance was burned. This project involved working closely with several risk analysis specialists and environmental toxicologists. Mr. Lichtwardt prepared a report discussing potential food webs in the local desert community and served as project manager and field biologist. Montgomery Watson. 1994.

Pacific Santa Fe Petroleum Pipeline, Colton, San Bernardino County, California to Craig Siding, Maricopa County, Arizona. This project consisted of a biological assessment and constraints analysis for a reconditioning project involving an existing 15-inch diameter petroleum pipeline. The study involved field surveys for sensitive habitats, plants, and animals along the entire pipeline easement (approximately 330 miles) and at nine sites for internal pipeline inspection activities. A report detailing potential biological constraints to the proposed project was prepared. The field work and report addressed a wide variety of federal and state listed endangered, threatened, and sensitive species (e.g. Delhi Sands Giant Flower-loving Fly, Coachella Valley Fringe-toed Lizard, Desert Tortoise, Burrowing Owl, California Gnatcatcher, and Yuma Clapper Rail) and habitat issues (e.g. wetlands). Mr. Lichtwardt served as project manager and lead biologist and authored the project technical report. Pacific Santa Fe Partners. 1993-1994.

SARA COHN

BIOLOGIST/NATURAL RESOURCES MANAGEMENT

EXPERTISE

Biological Resources Assessment and Survey
Wetland Delineation
Restoration Ecology
Construction and Mitigation Monitoring
Social Ecology and Land Management Issues
GPS

EDUCATION

California Polytechnic State University, San Luis Obispo, M.S., Natural Resources Management, in progress.

University of California, Irvine, B.S., Biology, Irvine, California, 2002.

Costa Rica Study Abroad Program, 1998.

England Study Abroad Program, 1998.

PROFESSIONAL EXPERIENCE

Biologist, LSA Associates, Inc., January 2003–present.

Clinical Research Assistant, Allergan, Inc., September 2002–December 2002.

Volunteer Research Assistant, County of Orange, Environmental Planning, winter 2001.

Lab Assistant, Biogen, Inc., Cambridge, Massachusetts, summer 1999.

PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Sara assists LSA's Project Managers in data collection for biological analyses as well as monitoring existing restoration and mitigation endeavors. Her ecological restoration experience includes nonnative species eradication and restoration of riparian and wetland habitats, coastal sage scrub communities, oak woodlands and saltwater marsh habitats. Monitoring responsibilities include construction monitoring before and after site grading, revegetation of mitigation areas, maintenance monitoring, and progress assessment. Sara assists in the preparation of biological assessments, wetland delineations, mitigation and monitoring plans, permit requests, maintenance reports, and annual reports. As a biologist for LSA, Sara's responsibilities include ensuring that construction and restoration projects are in compliance with regulatory policies and conditions such as those in Natural

Community Conservation Plan, Habitat Conservation Plans, NEPA/CEQA documents, and regulatory permits.

RELEVANT PROJECT EXPERIENCE

Her projects with LSA Associates, Inc. have included the following:

- Ecological restoration of sensitive habitats including coastal sage scrub and revegetation of sensitive plants including Nutall's milkvetch (*Astragalus nuttallii*) and native grasses (i.e. *Nassella lepida, Elymus glaucus*) at the PG&E Diablo Canyon Power Plant
- Construction monitoring for sewer line replacement at Camp San Luis (Army National Guard) for the Department of General Services, San Luis Obispo, California
- Assisted in plant surveys during the spring and summer of 2005 for a proposed potable water line replacement project at Camp San Luis (Army National Guard) for the Department of General Services, San Luis Obispo, California
- Preparation of sections of the SEIR for the Willow Road Extension/US-101 Interchange Project, San Luis Obispo County, California
- Assisted with the preparation and submittal of NEPA/CEQA biological technical reports for the Willow Road Extension/US-101 Interchange Project, San Luis Obispo County, California
- Assisted with the preparation of various EIR sections for the Santa Barbara Cottage Hospital Seismic Compliance and Modernization Plan, Santa Barbara, California
- Preparation of a Biological Resources Report for a proposed Medical Office Building in the Community of Nipomo, San Luis Obispo County
- Assisted in California Tiger Salamander (CTS) surveys and reporting during the rainy season of 2004-2005 on Kendall-Jackson Property, Los Alamos, California
- Assisted with the preparation of a Revegetation Plan associated with a proposed visual screen along State Highway 58 for the Santa Margarita Quarry, Santa Margarita, California
- Revegetation monitoring for the proposed visual screen for the Santa Margarita Quarry, Santa Margarita, California
- Preparation of preliminary biological assessment associated with a Preliminary Environmental Assessment Report for proposed improvements to Tefft Street, Community of Nipomo, San Luis Obispo County

CERTIFICATION CONFERENCES AND WORKSHOPS

Permitted to handle California Tiger Salamander (*Ambystoma californiense*) under LSA's 10(a)(1)(A) permit **(#TE-797234)**

State of California Scientific Collector's Permit

County of San Luis Obispo and Department of Fish and Game sponsored training workshop in the kit fox habitat evaluation process, March 2005

Attended the International Symposium on Society and Resources Management, Keystone, Colorado, June 2004.

Attended the Flowering Plant Identification Workshop–UC Berkeley, Friends of the Jepson's Herbarium, March 2004.

Presenter at the Social Aspects and Recreation Research Symposium, San Francisco, California, *Visitor Characteristics and Recreational Constraints in a Fire-Prone Ecosystem*, Summer 2002. William Hendricks, Debbie Chavez, and Sara Cohn, February 2004.

PROFESSIONAL MEMBERSHIPS/AFFILIATIONS

Association of Environmental Professionals
California Native Plant Society
Central Coast Biological Society

BROOKE LANGLE

SENIOR BIOLOGIST

EXPERTISE

Biological Resources Assessment
Biological and Botanical Surveys
Threatened and Endangered Species
Environmental Compliance, Construction, and Mitigation Monitoring
Environmental Training

EDUCATION

California State University, San Luis Obispo. B.S., Ecology and Systematic Biology, 1995.
California State University, San Luis Obispo. Concentration, Ecology, 1995.

PROFESSIONAL EXPERIENCE

Senior Biologist, LSA Associates, Inc., San Luis Obispo, California, April, 2006–present.

Compliance Services Manager, Senior Associate, Lead Environmental Inspector, Biologist, TRC Essex, San Luis Obispo, California, 1999–2006.

Environmental Monitor, Aspen Environmental, Agoura Hills, California, 1997–1999.

Environmental Inspector, Garcia and Associates, San Francisco, California, 1996–1997.

Environmental Monitor, Independent Contractor representing County of San Luis Obispo, Environmental Division, Nipomo, California, 1995–1997.

PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Ms. Langle's experience includes heavy involvement in client services, including staffing, marketing, utilization, and staff development. Other duties involve quality assurance for compliance programs, client development, and project management duties, both directly and as support to other project managers. She has a strong background in environmental resource management with over 10 years of experience in environmental inspection, monitoring, and training for large-scale construction projects. An ecologist by training, her experience includes complex, multi-jurisdictional projects, requiring coordination with a diverse range of agency, owner, and contractor personnel. Although her primary experience lies in California, she has worked on numerous projects in the western United States. Throughout the years, she has maintained a strong involvement with field biology work, including surveys and monitoring for California red-legged frogs, giant garter snake, Swainson's hawk, burrowing owls, and Pismo clarkia. Brooke has also conducted extensive environmental training, both

for projects and for the Federal Energy Regulatory Commission post-certificate environmental compliance seminars held throughout the United States.

RELEVANT PROJECT EXPERIENCE

- Project manager for biological constraints analysis near Arroyo Grande. Site found to contain Pismo clarkia.
- Project manager for the County of San Luis Obispo Biological Database Assessment project. Tasks include evaluating accuracy and completeness of existing data, identifying and acquiring new data from outside sources, and overall management of a tight budget and fast-paced schedule.
- Project manager for protocol level California red-legged frog surveys in San Luis Obispo. Duties include overall schedule and staff management, with a heavy involvement in conducting both day and night surveys.
- Project manager for biological constraints project in Orcutt. Duties include overall schedule and budget management, as well as document review and client communications.
- Conducted Pismo clarkia surveys for Willow Road Extension project near Nipomo.
- Project manager of an environmental compliance program for a new 234kV electric transmission line in San Diego, California
- Project manager of desert tortoise monitoring project for emergency natural gas pipeline repair project near Barstow, California
- Project manager for a biological monitoring project for a water pipeline near Santa Clarita, California
- Project manager for the Lopez Dam Seismic Retrofit; project included ongoing red-legged frog surveys and monitoring for known presence of red-legged frogs as well as ensuring compliance with mitigation measures to protect all sensitive resources in the project area
- Conducted numerous habitat assessments throughout San Luis Obispo County for the County Department of Public Works
- Assisted the County of San Luis Obispo Department of Public Works in obtaining necessary permits for various projects throughout the county, including site visits with regulatory agencies
- Project manager and lead biologist for a pipeline replacement project in Contra Costa County on a site with known presence of California red-legged frogs and breeding ponds
- Project manager of a natural gas pipeline routing and feasibility study in northern California
- Project manager of an environmental compliance program for a natural gas pipeline and storage facility in Louisiana
- Project manager of an environmental compliance program for a new 345kV electric transmission line in Maine

PRESENTATIONS

2006	Southern Gas Association: Two presentations (Trench dewatering and hydrostatic discharge: methods and lessons learned; Wetland Construction in the West)
2003	San Francisco Bay Area Chapter of AEP: Survival of the fittest: the evolution of mitigation measures from the keyboard to the construction site
2002	Monterey Bay Area Chapter of AEP: Panel discussion on how to evaluate effective mitigation and monitoring conditions
2000	Wildlife Society Annual Conference: Review of a successful compliance project

PROFESSIONAL MEMBERSHIPS/AFFILIATIONS

Member, Western Section of the Wildlife Society, Central Coast Chapter
California Department of Fish and Game Scientific Collector's Permit #80115405

David Wolff Environmental

Biological Resources Analysis, Planning & Monitoring Regulatory Compliance Specialist
David@DKWEnvironmental.com www.dkwenvironmental.com
P.O. 6552, Los Osos, CA 93412
(805) 235-5223

David Wolff Environmental (DWE) provides high quality and cost effective biological resources planning and regulatory compliance services for public and private sector clients throughout California. DWE brings experience and expertise in addressing biological resources for the full gamut of project types including large linear infrastructure projects, remediation, roadways, water resources and flood control, public and private developments, golf courses, habitat restoration, and regional habitat conservation planning. DWE specializes in baseline biological and wetland resources studies, regulatory compliance strategies, and permit process facilitation. DWE's full line of environmental services is supported by the following capabilities:

- Fairy Shrimp Surveys (Wet and Dry Season) Recovery Permit #TE-090849-0
- Biological Assessment and Constraints Analysis
- Rare Plant Survey and Floristic Inventory
- Vegetation Mapping and Habitat Identification
- Wildlife Surveys
- California Red-Legged Frog Surveys
- USFWS Approved CA Red-Legged Frog Construction Monitor
- General Environmental Compliance Monitoring
- San Joaquin Kit Fox Habitat Evaluations
- Wetland Delineation
- Geographic Information System (GIS) Mapping for Resource Planning Applications
- CEQA/NEPA & General Plan Biological Resources Analysis
- Process Facilitation for Environmental Compliance & Project Implementation

David Wolff has served a wide range of public and private sector clients throughout his 28 year professional career. Mr. Wolff has provided his expertise in biological resources analysis and planning, and regulatory compliance to meet the land use objectives of private, local, state, and federal agency clients throughout California. In addition, he is an experienced environmental educator, trainer and speaker on environmental issues.

Capabilities & Experience

David Wolff is the Principal Ecologist of DWE and a Certified Professional Wetland Scientist with 28 years of professional experience. Mr. Wolff has special expertise in both flora and fauna, including terrestrial, freshwater aquatic, estuarine, and marine environments. He is knowledgeable in many bioregions of California including north, central and south coastal & inland areas, Great Valley, Sierra Nevada foothills, and Southern California coastal, inland, and desert regions. Along with his

regional and landscape-scale resources planning experience, he is also an accomplished wetland scientist, botanist, and wildlife biologist well versed in endangered species issues.

Mr. Wolff is a highly trained and experienced wetland scientist whose achievements include the delineation of wetlands, Clean Water Act Section 404 permitting, mitigation planning, and the creation, restoration, and monitoring of wetland and riparian habitats. He has performed wetland delineations on sites up to 4,500 acres and assisted clients with obtaining both Individual and Nationwide Permits from the Corps for development and infrastructure projects. Mr. Wolff has conducted and managed endangered plant and wildlife species surveys and holds vernal pool fairy shrimp survey Recovery Permit TE090849-0 and is a USFWS approved California red-legged frog construction monitor. He has facilitated ESA Section 7 Formal Consultations and has managed the preparation of project-specific and large-scale regional multi-species Habitat Conservation Plans that have involved city and county land use approval processes and agency/public consensus building programs. He is experienced in CEQA/NEPA and California Coastal Act compliance.

Mr. Wolff is well versed in the planning process and has successfully performed as an integral member of planning, design, and engineering teams providing environmental regulatory compliance insight for local agency regional flood control planning, General Plan updates, water resources, energy/utility, special district, and private development projects.

Employment History

David Wolff Environmental, Principal Ecologist/Owner, October 2003 – Present
Rincon Consultants, Manager, Biological Resources Group, April 2000 – September 2003
Foothill Associates, Sr. Biologist, Central Coast Office Manager, August 1998 – March 2000
EIP Associates, Senior Biologist, Sacramento, April 1989 – July 1998
Environmental, Camping and Outdoor Educator, San Francisco Bay Area, 1976 – 1989

Education

Bachelor of Arts (Ecology and Systematic Biology), San Francisco State University

Jason L. Kirschenstein

Jason Kirschenstein serves as the Principal Biologist for Sage Institute, Inc. (SII). Mr. Kirschenstein is highly trained and experienced in general and special-status wildlife and vegetation surveys, mitigation planning, regulatory permitting/consultations, Geographic Information System (GIS) applications, and environmental impact analysis. Mr. Kirschenstein is also well versed in the planning process, and has successfully performed as an integral member of planning and design teams where he has provided biological and regulatory compliance insight for local agencies, utility companies, and private development projects.

TECHNICAL CAPABILITIES

Mr. Kirschenstein has conducted numerous biological surveys and is experienced in preparing biological assessments related to flora, fauna, endangered species, sensitive habitats and construction and mitigation monitoring. Mr. Kirschenstein has extensive experience in the preparation of permit packages for Clean Water Act Section 404 U.S. Army Corps of Engineers permits, CWA Section 401 Certifications from the Regional Water Quality Control Board, and California Department of Fish and Game Section 1602 Streamed Alteration Agreements. Mr. Kirschenstein has also managed the preparation of U.S. Fish and Wildlife Service Section 7 and Section 10 documentation for compliance with the Federal Endangered Species Act and CDFG Section 2081 take authorization documentation for compliance with the California Endangered Species Act. Mr. Kirschenstein has worked closely with various local agencies in California on permitting and environmental compliance projects, and is proficient in CEQA and NEPA analysis. Mr. Kirschenstein has over nine years of experience working with various GIS applications. His GIS capabilities range from habitat suitability mapping to utilizing GIS to perform complex analyses. Throughout his career, he has worked closely with a multitude of public agencies and private interests to obtain and properly manage GIS data. Mr. Kirschenstein's proficiency with advanced GPS technology, AutoCAD applications, image processing software, database management, and other GIS-related equipment enhances his overall GIS production and management capabilities.

EDUCATION, REGISTRATIONS AND AFFILIATIONS

- B.S., Forestry and Natural Resource Management with concentration in Wildlife Biology, California PolytechnicState University, San Luis Obispo
- Association of Environmental Professionals, Audubon Society, Wildlife Society
- Southern Sierra Research Station Southwestern Willow Flycatcher Workshop and Certification
- CDFG Blunt-Nosed Leopard Lizard Identification Workshop and Certification
- Morro Shoulderband Snail Protocol Survey Training

EMPLOYMENT HISTORY

- Sage Institute, Inc. (2003 to present)
- California Polytechnic State University Dendrology Instructor (2000 to 2002)
- Rincon Consultants, Inc. (1998 to 2003)

Victoria Trautman
4160 Parkhill Road, Santa Margarita, CA 93453
805-438-3922

WORK HISTORY

1999-present ***Wildlife Consultant; Jordan Environmental Services, Guadalupe, CA***
Monitor remediation activities at Unocal/Guadalupe Remediation Site. Conduct pre-activity and eyeshine surveys for California red-legged frog; survey for sensitive species such as western spadefoot toads and silvery legless lizards; monitor remediation site utilization; prepare project related monitoring and survey reports.

1998-2003 ***Wildlife Consultant; Essex Environmental, Morro Group, Harding Lawson***
Survey for San Joaquin kit fox, California red-legged frog, and tiger salamander. Conduct steelhead habitat remediation surveys. Monitor construction activities in steelhead, tiger salamander and red-legged frog habitat. Conduct annual bird surveys at Camp Roberts and Camp San Luis Obispo National Guard Training Sites.

1992-1999 ***Wildlife Biologist; Cal Poly Foundation***
Assisted Program Biologist with monitoring of threatened and endangered species at Camp Roberts and Camp San Luis Obispo National Guard Training Sites, with emphasis on San Joaquin kit fox. Primary responsibilities included pre-activity surveys, scent station and spotlight surveys, bi-annual small mammal and annual kit fox live-trapping. Assisted with brown-headed cowbird trapping program, annual site-wide bird surveys, and black bear surveys.

1996-1998 ***Biological Consultant; Chevron Oil Corporation, Taft, CA***
Surveyed for threatened and endangered species, including San Joaquin kit fox, blunt-nosed leopard lizard, antelope ground squirrel and giant kangaroo rat.

1994-1996 ***Teaching Associate; California Polytechnic University***
Taught biology labs, from cell ecology to population dynamics, for biology majors and non-majors.

1994-1996 ***Lab assistant; California Polytechnic University***
Assisted ornithology professor at Cal Poly, with introductory and acoustic ornithology classes, maintained Cal Poly avian and mammal collections; conducted bird surveys for wildlife management professors; maintained aquatic animal collection for animal behavior professor.

1989-1994 ***Volunteer Coordinator; Hearst San Simeon State Historical Monument***
Developed and managed living history program; recruited, trained and managed program volunteer staff of 100-plus docents.

1986-1989 ***National Park Service Ranger; Chinle, AZ; Ventura, CA***
Interpretive ranger for NPS at Canyon de Chelly and Channel Island National Monuments.

EDUCATION

1993-1996 Master of Biology, California Polytechnic University.
1984-1988 Bachelor of Science, Florida International University.

SUMMARY

Work experience includes extensive monitoring and surveying for threatened and endangered species, including California red-legged frog and San Joaquin kit fox. Additional experience includes avian and small mammal surveys, cowbird control, and CDFG black bear surveys. I am permitted by USFWS and CDFG to handle California red-legged frogs (site specific) and San Joaquin kit fox (site specific). Author of *Spirit of the Valley: An Ecological Mythology of an Oak Savanna*, Sierra Club, 2000.