An aerial photograph of a river system. A large concrete-lined channel runs parallel to a road on the left side of the river. In the background, there are several buildings and a parking lot. The surrounding area is densely wooded with green trees. The river flows from the top right towards the bottom left of the frame.

# Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project

## Final Environmental Impact Statement/ Environmental Impact Report

SCH No. 2011042102

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**February 2013**



# Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project

## *Final Environmental Impact Statement/ Environmental Impact Report*

**Project Location:** Sacramento River National Wildlife Refuge, Butte and Glenn Counties, California

**Abstract:** The Final EIS/EIR documents the comments received on the Draft EIS/EIR, responses to those comments, and changes to the Draft EIS/EIR in response to comments. The Draft EIS/EIR fully evaluates the effects of the proposed action (proposed project) and alternatives and is incorporated by reference in the Final EIS/EIR. The proposed action consists of a combination of measures to restore riparian habitat at the Llano Seco Riparian Sanctuary Unit (Riparian Sanctuary) of the Sacramento River National Wildlife Refuge (Sacramento River NWR) and to protect the alignment of the Sacramento River at the water diversion for the Princeton-Codora-Glenn and Provident Irrigation Districts (PCGID-PID) pumping plant and fish screen facility at River Mile 178. Habitat restoration is needed because the Riparian Sanctuary is currently dominated by non-native plants and provides poor habitat value for wildlife; bank protection measures are needed to protect the water diversion for the PCGID-PID pumping plant and fish screen facility. The restoration plan includes removing non-native and invasive plants, cleaning up flood debris, and planting native species at varying frequencies and densities. Bank protection measures being considered include installation of spur dikes or traditional riprap combined with maintenance or removal of the existing revetment on a peninsula upstream of the facility. A final mitigation monitoring and reporting program is included with the Final EIS/EIR.

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Appendix A. Final Mitigation Monitoring and Reporting Program

Appendix B. Air Quality Modeling Report for the Riparian Sanctuary Project (Appendix A to the report is on compact disk inside the back cover)

## ACRONYMS AND ABBREVIATIONS

BCAQMD	Butte County Air Quality Management District's
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
Corps	U.S. Army Corps of Engineers
DWR	California Department of Water Resources
EIR	environmental impact report
EIS	environmental impact statement
IPM	Integrated Pest Management
MMRP	mitigation monitoring and reporting program
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NOP	Notice of Preparation
NO <sub>x</sub>	nitrogen oxides
NWR	National Wildlife Refuge
PCGID-PID	Princeton-Codora-Glenn and Provident Irrigation Districts
PM <sub>2.5</sub>	fine particulate matter
PM <sub>10</sub>	coarse particulate matter
PUP	Pesticide Use Proposal
Riparian Sanctuary	Llano Seco Riparian Sanctuary Unit
Riparian Sanctuary project	Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project
RM	River Mile
ROG	reactive organic gases
Service	U.S. Fish and Wildlife Service



# Chapter 1 Introduction

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This Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was prepared by the U.S. Fish and Wildlife Service (Service) and the California Department of Fish and Wildlife (CDFW, formerly known as the California Department of Fish and Game) to respond to comments received on the Draft EIS/EIR for the Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project (Riparian Sanctuary project). The document was prepared in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This chapter presents an overview of the Final EIS/EIR contents; summarizes the project background, purpose of and need for the project, and alternatives evaluated in the Draft EIS/EIR; describes the preferred alternative and associated impacts; discusses public involvement; and identifies the decisions that need to be made on the project.

## 1.1 Organization of the Final EIS/EIR

The Final EIS/EIR incorporates by reference the Draft EIS/EIR, which is available upon request from the lead agencies. This document contains the information required for final EISs and EIRs by the Council on Environmental Quality regulations for implementing NEPA (40 CFR Section 1502) and the CEQA Guidelines (PRC Section 15132). It is organized into the following chapters:

- **Chapter 1. Introduction:** Provides an overview of the EIS/EIR and the Riparian Sanctuary project.
- **Chapter 2. Responses to Comments:** Includes copies of comment letters received on the Draft EIS/EIR and responses to comments.
- **Chapter 3. Changes to the Draft EIS/EIR:** Identifies changes to the Draft EIS/EIR to address comments received. The Draft EIS/EIR is incorporated by reference and not reproduced in its entirety in this Final EIS/EIR.
- **Appendix A. Final Mitigation Monitoring and Reporting Program:** Presents the final Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures needed to reduce potentially significant effects of the preferred alternative.
- **Appendix B. Supplemental Air Quality Analysis:** Presents the supplemental air quality analysis that was conducted in response to comments provided on the Draft EIS/EIR.

## 1.2 Project Overview

This section presents an overview of the Riparian Sanctuary project, including alternatives, as it was evaluated in the Draft EIS/EIR. The proposed action (proposed project) evaluated in the Draft EIS/EIR consists of a combination of measures to restore riparian habitat at the Llano Seco Riparian Sanctuary Unit (Riparian Sanctuary) of the Sacramento River National Wildlife Refuge (Sacramento River NWR) and to protect the alignment of the Sacramento River at the water diversion for the Princeton-Codora-Glenn and Provident Irrigation Districts (PCGID-PID) pumping plant and fish screen facility at River

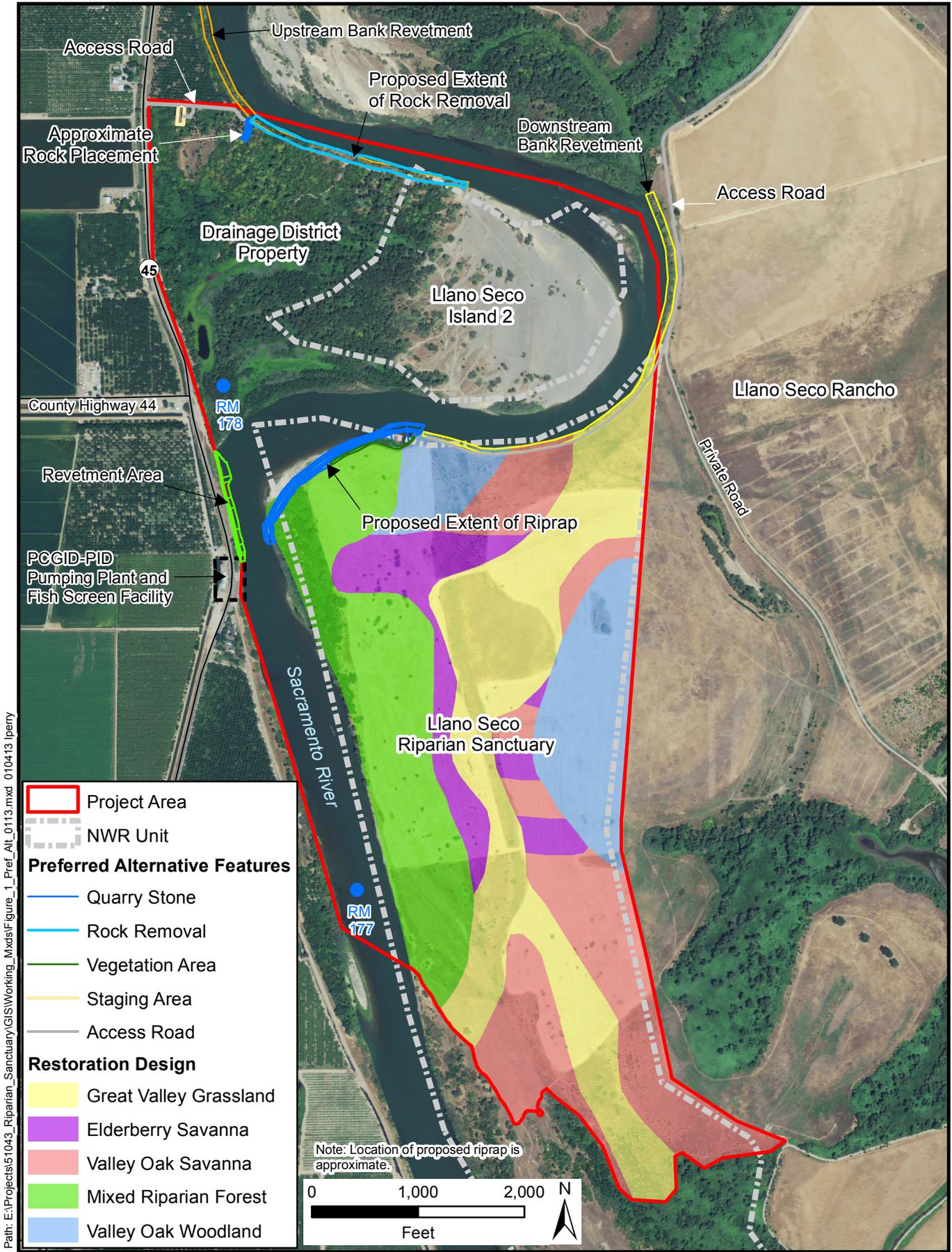
Mile (RM) 178. Habitat restoration is needed because the Riparian Sanctuary is currently dominated by non-native plants and provides poor habitat value for wildlife; bank protection measures are needed to protect the water diversion for the PCGID-PID pumping plant and fish screen facility over the long term. The proposed restoration plan includes removing non-native and invasive plants, cleaning up flood debris, and planting native species at varying frequencies and densities. Bank protection measures that were considered include installation of spur dikes or traditional riprap with or without a low berm, as well as the possible removal of existing revetment along the Sacramento River upstream of the pumping plant and fish screen facility and the Riparian Sanctuary.

The project area discussed in the Draft EIS/EIR encompasses approximately 400 acres in the northern portion of the Riparian Sanctuary, a peninsula north of the Riparian Sanctuary, and the banks of the Sacramento River adjacent to and just upstream of the Riparian Sanctuary (between RM 178 and RM 180) (Figure 1-1). The 950-acre Riparian Sanctuary is located 15 miles southwest of Chico on the east bank of the Sacramento River between RM 176.5 and RM 178 in the southwest corner of Butte County. The peninsula across from the Riparian Sanctuary contains federal (Llano Seco Island 2 refuge unit), state, and private lands and is in Butte and Glenn counties. The Riparian Sanctuary and Llano Seco Island 2 are part of the Sacramento River NWR, a refuge managed by the Service as part of the Sacramento NWR Complex.

### 1.2.1 Background and History

The Riparian Sanctuary was once part of the historic Llano Seco Rancho, a nearly 18,000-acre ranch established in 1844 by a Mexican government land grant. In 1991, the Service acquired the lands currently known as the Riparian Sanctuary along with other properties that became part of the Sacramento River NWR and North Central Valley Wildlife Management Area–Llano Seco Unit. During the 1970s, portions of the Llano Seco Rancho, including the Riparian Sanctuary, were cleared of riparian and other native vegetation to support expanded agricultural production. The Riparian Sanctuary has been largely out of agricultural production for nearly 15 years, and much of the vegetation has become dominated by non-native and invasive noxious weeds. Currently, just over 200 acres are farmed with dryland row crops to help control weeds.

In 1999, the PCGID-PID consolidated three existing unscreened pumping plants on the Sacramento River into a single pumping plant with a state-of-the-art fish screen at RM 178. Flow from the Sacramento River is currently diverted into the pumping plant through the fish screen, which was installed to protect endangered fish species such as juvenile Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*). With a capacity of 600 cubic feet per second, the pumping plant is the fourth largest on the Sacramento River and serves nearly 30,000 acres of orchards, row crops, rice, and wetlands. The efficiency of the fish screen at the pumping plant is being threatened by bank erosion on the Riparian Sanctuary and the migration of the Sacramento River.



**Figure 1-1.**  
**Preferred Alternative**

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Rock revetment was placed along the Camp 2 Bend of the river upstream of the Riparian Sanctuary and on the upstream peninsula by the U.S. Army Corps of Engineers (Corps) in the 1980s, more than a decade prior to construction of the pumping plant, to hold the Sacramento River in place and ensure that flood flows would continue to be diverted from the river through the Goose Lake overflow structure and into the Butte Basin to the east.

The natural riverbank on the east side of the river downstream of the Corps revetment and directly across from the pumping plant on the Riparian Sanctuary has eroded approximately 600 feet since the 1980s. Continued erosion is predicted to change the angle of flow and velocity of the water passing the fish screen, trapping fish against the screen rather than sweeping them past. If that happens, the pumping plant facility would not meet National Marine Fisheries Service guidelines for operation of pumping plant fish screens. Erosion of the bank could also cause the Sacramento River to migrate further east, away from the facility, resulting in the facility not being able to operate effectively.

### **1.2.2 Purpose of and Need for the Action**

The purpose of the Riparian Sanctuary project is to restore habitat at the Riparian Sanctuary and to protect the PCGID-PID pumping plant and fish screen facility. The efficiency of the fish screen at the pumping plant is being threatened by bank erosion on the Riparian Sanctuary and the migration of the Sacramento River. The project is needed to provide habitat for endangered species and migratory birds, improve overall riparian health along the Sacramento River, and protect the fish screen and intake facility to maintain their functions. Habitat restoration is also needed at the Riparian Sanctuary to achieve Service management goals and objectives for the Sacramento River NWR identified in the Comprehensive Conservation Plan for the refuge, specifically Objective 1.1, Strategy 1.1.4, and Objective 1.2, Strategies 1.2.1 and 1.2.3.

The following CEQA project objectives were identified for the Riparian Sanctuary project:

- improve habitat conditions at the Riparian Sanctuary to contribute to endangered species recovery and overall riparian health;
- use an interdisciplinary scientific approach to restore riparian habitat at the Riparian Sanctuary; and
- protect the operation of the PCGID-PID pumping plant and fish screen facility from anticipated river meander.

### **1.2.3 Summary of Alternatives Evaluated**

The Service and CDFW evaluated the No-Action Alternative and three action alternatives in the Draft EIS/EIR. Table 1-1 summarizes the components of each alternative, and a brief overview of the alternatives is provided below.

**Table 1-1. Summary of Alternatives Features**

<b>Alternative</b>	<b>Bank Protection Measure</b>	<b>Restoration Activity</b>
Alternative 1: No-Action Alternative	No specific measures	Weed removal and natural recruitment
Alternative 2: Spur Dikes and Site-Specific Plantings	Spur dikes	Site-specific plantings across Riparian Sanctuary
Alternative 3: Traditional Riprap and Site-Specific Plantings	Traditional riprap with or without low berm	Site-specific plantings across Riparian Sanctuary
Alternative 4: Traditional Riprap with Upstream Rock Removal and Site-Specific Plantings	Traditional riprap with or without low berm and upstream rock removal	Site-specific plantings across Riparian Sanctuary

Alternative 1 entails continuation of current maintenance and management practices for the existing revetment along the Sacramento River and on the Riparian Sanctuary. The State (Department of Water Resources) would coordinate with the Corps on any maintenance required on the existing revetment. PCGID-PID would continue to maintain their pumping plant and fish screen facility as they have in the past. The Service would continue to implement weed control practices on the Riparian Sanctuary and rely on natural recruitment for restoration.

Alternative 2 includes construction of spur dikes along the northwest bank of the Riparian Sanctuary and site-specific plantings across 400 acres of the Riparian Sanctuary. Eight rock spur dikes would be installed along approximately 2,000 feet of the river and would extend 75 feet out from the bank, primarily along an existing gravel bar that is exposed at low water levels just off the natural bank. The dikes would require approximately 12,160 total tons of riprap. The restoration plan would include a range of tree densities from low to high, with higher densities along the Sacramento River on the west side of the Riparian Sanctuary and on the east side of the Riparian Sanctuary and lower densities along a flood conveyance channel through the center of the Riparian Sanctuary, and a mixture of native plant species. Plant communities would include approximately 116 acres of Great Valley grassland, 134 acres of elderberry and valley oak savanna, and 149 acres of valley oak woodland and mixed riparian forest.

Alternative 3 includes construction of traditional riprap with or without a low berm along the northwest bank of the Riparian Sanctuary and site-specific plantings as described for Alternative 2. The traditional riprap with a low berm would extend approximately 2,700 feet along the bank and 150 feet out from the bank, with some of the riprap extending beyond the gravel bar into the river. Approximately 44,400 tons of quarry stone and 24,750 tons of soil-filled quarry stone would be required for the riprap with berm. The traditional riprap without a berm would extend approximately 2,500 feet along the bank and 100 feet out from the bank, with most of the riprap on the gravel bar. Approximately 89,100 tons of material would be excavated for the toe trench (in lieu of a low berm), and the riprap and backfill would require approximately 36,000 tons of quarry stone and 20,000 tons of soil-filled quarry stone.

Alternative 4 includes construction of traditional riprap as described for Alternative 3, site-specific plantings as described for Alternative 2, and removal of rock along the upstream peninsula. Approximately 33,075 tons of rock are expected to be removed from the upstream bank revetment along approximately 2,260 feet of bank. The revetment would be removed by working from the top of the bank

with a hydraulic excavator that would reach down the slope between existing woody vegetation to scrape as much of the stone materials off the existing bank as it can reach. Some of the rock would be placed at the existing ground elevation along the adjacent private property on Drainage District property, extending between 500 and 700 feet, to protect the private property when the river cuts off.

## **1.3 Preferred Alternative**

### **1.3.1 Description of Preferred Alternative**

The Service and CDFW, in coordination with PCGID-PID, River Partners, and the design engineers, developed a preferred alternative based on the features of Alternative 4. The preferred alternative includes installation of traditional riprap on the northwest bank of the Riparian Sanctuary, including a low berm along the gravel bar and a toe trench just off the gravel bar; removal of upstream rock; and site-specific plantings on the Riparian Sanctuary (Figure 1-1). The upstream rock removal and site-specific plantings would be the same as described for Alternative 4 in the Draft EIS/EIR. The traditional riprap was designed to incorporate the beneficial features of both the low berm and no berm options described in Alternative 4. The traditional riprap without a berm (i.e., the excavated and backfilled toe trench) would be located in areas where the channel would be affected to reduce the footprint, and a low berm would be located across the gravel bar and would be planted with native trees, sedges, and grasses along with large woody debris to provide immediate fish habitat. For comparison with the two options of Alternative 4, the traditional riprap under the preferred alternative would involve less excavation than the no berm option and have a smaller footprint than the low berm option, resulting in less riprap placement in the Sacramento River. It would incorporate the key benefit of the low berm option by providing a planting surface for native vegetation.

The bank protection would extend approximately 1,990 feet along the Sacramento River bank and up to 100 feet out from the bank, primarily on the existing gravel bar. The low berm would extend about 1,480 feet along gravel bar. The low berm would have slopes of 2:1 to 10:1 for plantings and anchoring woody debris. The woody debris would be anchored in groups of three to five trees about 20 to 25 feet apart, extending about 600 feet along the lower slope of the bank protection (in or near the water level, depending on the water surface elevation). Soil fill and most of the soil-filled quarry stone would be placed above the summer mean water surface (elevation of 86 feet); quarry stone and some backfill would be placed below the water surface after excavating up to 60 feet of the riverbed beyond the gravel bar. A scour hole on the east side of the gravel bar would be filled in with soil fill, and the outer edge of the fill (contoured to match the bank on both sides of the scour hole) would be reinforced, requiring placement of quarry stone at a 2:1 slope and extending out about 60 feet into the river (below the summer mean water). Some excavation of the riverbed would be necessary (about 40 feet out from the edge of the soil fill), and the excavated area would be reinforced with quarry stone and backfilled below the water level. Soil-filled quarry stone and soil cover would be installed at a 2:1 slope above the summer mean water elevation and the quarry stone to reinforce the soil fill. Similar protection would be installed at the downstream end of the low berm, although minimal soil fill would be needed and most of the quarry stone would be along the existing bank.

Installation of the bank protection would result in an estimated 20,810 cubic yards of excavated material and would require the placement of an estimated 19,610 cubic yards of fill, 5,920 cubic yards of backfill, 1,800 cubic yards of soil cover, 19,360 tons of quarry stone, and 8,190 tons of soil-filled quarry stone. An estimated 10,781 cubic yards of rock along 2,220 feet of the upstream bank (on the north side of the peninsula) would be removed to an elevation of about 80 feet (just below the summer mean water surface). A portion of this rock (approximately 3,765 cubic yards) would be replaced along 200 feet of the Drainage District property, where the predicted cut-off channel would form, to protect the private property on the peninsula from further erosion. Placement of this rock spur would also require excavation of about 4,460 cubic yards of material and placement of about 1,810 cubic yards of soil cover after the rock is placed.

### 1.3.2 Impacts of Preferred Alternative

The preferred alternative is a hybrid of the two options presented for Alternative 4 in the Draft EIS/EIR, and the impacts of the preferred alternative would be comparable to those described for Alternative 4 in Chapter 3 of the Draft EIS/EIR. For this reason, a full analysis of the preferred alternative is not being conducted, but a comparison of the impacts and discussion of the key effects are presented below. Table 1-2 compares the two options of Alternative 4 with the preferred alternative and identifies the level of significance for each impact discussed in the Draft EIS/EIR. The mitigation measures described in the Draft EIS/EIR, as modified in Chapter 3 of this Final EIS/EIR, would apply to the preferred alternative, and the level of significance in the table is the final level with implementation of the mitigation measures. Impacts explained in more detail for the preferred alternative are identified with an asterisk (\*) and are discussed after the table.

**Table 1-2. Summary of Impacts for Alternative 4 and Preferred Alternative**

<b>Impact</b>	<b>Alternative 4 (No Berm)</b>	<b>Alternative 4 (Low Berm)</b>	<b>Preferred Alternative</b>
<b><i>Land Use</i></b>			
Impact LU-1: Construction activities could disrupt or conflict with nearby land uses.	Less than Significant	Less than Significant	Less than Significant
Impact LU-2: Implementation of the Riparian Sanctuary project could change land uses in the project area.	Less than Significant	Less than Significant	Less than Significant
Impact LU-3: Implementation of the Riparian Sanctuary project could conflict with management plans for the project area.	Less than Significant	Less than Significant	Less than Significant
<b><i>Geology, Fluvial Geomorphology, and Soils</i></b>			
Impact GS-1: Construction activities would disturb soil and could result in erosion or loss of topsoil.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact GS-2: Implementation of the Riparian Sanctuary project could modify the channel morphology of the Sacramento River between RM 177.5 and RM 179.	Less than Significant	Less than Significant	Less than Significant

**Table 1-2. Summary of Impacts for Alternative 4 and Preferred Alternative**

<b>Impact</b>	<b>Alternative 4 (No Berm)</b>	<b>Alternative 4 (Low Berm)</b>	<b>Preferred Alternative</b>
Impact GS-3: Implementation of the Riparian Sanctuary project could expose people or structures to geologic hazards.	Less than Significant	Less than Significant	Less than Significant
<b><i>Water Resources</i></b>			
Impact WR-1: Construction activities could result in short-term increases in turbidity and sediment levels that could degrade water quality and affect the beneficial uses of the Sacramento River.	Less than Significant with Mitigation	Significant with Mitigation	Less than Significant with Mitigation*
Impact WR-2: Disturbance of streambed sediments and stockpiling could release mercury into the environment, which could degrade water quality, contaminate soils, and affect the beneficial uses of the Sacramento River.	Less than Significant with Mitigation	Less than Significant with Mitigation	No impact*
Impact WR-3: Construction and implementation of the Riparian Sanctuary project could release hazardous materials into the environment, which could degrade water quality and affect the beneficial uses of the Sacramento River.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
Impact WR-4: Implementation of the Riparian Sanctuary project could increase turbidity and sedimentation in the Sacramento River for several years after construction, which could degrade water quality and affect the beneficial uses of the Sacramento River.	Less than Significant	Less than Significant	Less than Significant
Impact WR-5: Implementation of the Riparian Sanctuary project could modify flood flows through the project area as a result of the change in the Sacramento River channel and restoration activities and expose people, property, or structures to flood risks.	Less than Significant	Less than Significant	Less than Significant
Impact WR-6: Restoration of the Riparian Sanctuary would require the use of ground water, which could deplete groundwater supplies in the groundwater basin.	Less than Significant	Less than Significant	Less than Significant
<b><i>Fishery Resources</i></b>			
Impact FR-1: In-water construction activities could result in the direct mortality of or injury to anadromous and resident fishes, including special-status fishes.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*

**Table 1-2. Summary of Impacts for Alternative 4 and Preferred Alternative**

<b>Impact</b>	<b>Alternative 4 (No Berm)</b>	<b>Alternative 4 (Low Berm)</b>	<b>Preferred Alternative</b>
Impact FR-2: Construction activities could result in increased erosion and sedimentation levels that could adversely affect anadromous and resident fishes.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact FR-3: Construction of the Riparian Sanctuary project could result in accidental spill of hazardous materials that could adversely affect fishes.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
Impact FR-4: Implementation of the Riparian Sanctuary project could result in impacts to spawning, rearing, and migratory habitat for anadromous and resident fishes, including designated critical habitat and essential fish habitat.	Less than Significant	Less than Significant	Less than Significant
Impact FR-5: Implementation of the Riparian Sanctuary project could result in impacts to anadromous and resident fishes from in-water activities, increased turbidity, or hazardous materials spills.	Less than Significant	Less than Significant	Less than Significant
<b><i>Vegetation, Wildlife, and Sensitive Biological Resources</i></b>			
Impact VW-1: Construction and implementation of the Riparian Sanctuary project could modify habitats in the project area and increase the spread of invasive plant species.	Less than Significant	Less than Significant	Less than Significant
Impact VW-2: Construction of the Riparian Sanctuary project could result in placement of fill material into waters of the United States and disturbance of wetlands.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact VW-3: Construction and implementation of the Riparian Sanctuary project could affect special-status plant and animal species in fresh emergent wetland habitat on the upstream peninsula.	Less than Significant	Less than Significant	Less than Significant
Impact VW-4: Construction and implementation of the Riparian Sanctuary project could remove or disturb elderberry shrubs and adversely affect the federally listed valley elderberry longhorn beetle.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact VW-5: Construction and implementation of the Riparian Sanctuary project could adversely affect nesting bank swallows and their habitat.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*

**Table 1-2. Summary of Impacts for Alternative 4 and Preferred Alternative**

<b>Impact</b>	<b>Alternative 4 (No Berm)</b>	<b>Alternative 4 (Low Berm)</b>	<b>Preferred Alternative</b>
Impact VW-6: Construction and implementation of the Riparian Sanctuary project could adversely affect other special-status species that nest or breed in the project area and their habitat.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact VW-7: Implementation of the Riparian Sanctuary project could restrict terrestrial wildlife movement through the project area.	No Impact	No Impact	No Impact
<b><i>Cultural Resources</i></b>			
Impact CR-1: Construction and implementation of the Riparian Sanctuary project could affect the integrity of site CA-BUT-2658.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
Impact CR-2: Construction activities could disturb or damage previously undiscovered historical or archaeological resources or human remains.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
<b><i>Transportation and Traffic</i></b>			
Impact TT-1: Construction activities could increase traffic or affect circulation on nearby roads or highways.	Less than Significant	Less than Significant	Less than Significant
Impact TT-2: Implementation of the Riparian Sanctuary project could affect long-term traffic or circulation on nearby roads or highways.	Less than Significant	Less than Significant	Less than Significant
<b><i>Air Quality</i></b>			
Impact AQ-1: Construction activities could generate short-term vehicle or equipment emissions or air pollutants that could affect local or regional air quality.	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation*
Impact AQ-2: Implementation of the Riparian Sanctuary project could affect air quality over the long term.	Less than Significant	Less than Significant	Less than Significant
<b><i>Noise</i></b>			
Impact NO-1: Construction activities could generate noise above acceptable standards and expose sensitive receptors to substantial noise levels.	Less than Significant	Less than Significant	Less than Significant
Impact NO-2: Implementation of the Riparian Sanctuary project could increase ambient noise levels in the project area over the long term.	Less than Significant	Less than Significant	Less than Significant

**Table 1-2. Summary of Impacts for Alternative 4 and Preferred Alternative**

Impact	Alternative 4 (No Berm)	Alternative 4 (Low Berm)	Preferred Alternative
<b>Aesthetics</b>			
Impact AE-1: Construction activities could degrade the visual character of the project area or modify scenic views of the vicinity.	Less than Significant	Less than Significant	Less than Significant
Impact AE-2: Implementation of the Riparian Sanctuary project could modify the visual character of the project area over the long term.	Less than Significant	Less than Significant	Less than Significant

For the impacts discussed below, the hybrid version of the traditional riprap would result in slightly different impacts than those described for the traditional riprap options of Alternative 4 in the Draft EIS/EIR (note that some impact discussions relating to the riprap are presented under Alternative 3 in the Draft EIS/EIR because it contains the same riprap options as Alternative 4). The impacts under the preferred alternative would be less intense than the most intense impacts of Alternative 4. Mitigation measures identified in the Draft EIS/EIR for impacts relating to the traditional riprap would be implemented for the preferred alternative and would adequately reduce impacts to less-than-significant levels. All impacts relating to the site-specific restoration plan and rock removal on the upstream peninsula, including the formation of a cut-off channel, would be the same as described in the Draft EIS/EIR; all of these impacts would be less than significant or reduced to less-than-significant levels with mitigation. The preferred alternative would not result in any significant and unavoidable impacts. The final MMRP is presented in Appendix A and incorporates revisions to mitigation measures to respond to comments received on the Draft EIS/EIR (see Chapter 3 of this Final EIS/EIR for the specific changes).

**Soil Impacts.** The hybrid version of the traditional riprap would have a smaller permanent footprint than the traditional riprap with a low berm and a slightly larger permanent footprint than the traditional riprap without a berm, although the temporary area of disturbance would be the same (about 9 acres of disturbance during installation of the riprap and 4 acres of disturbance for removal of riprap). In addition, less excavation would be needed for the toe trench compared with the traditional riprap without a berm. As a result, soil disturbance and associated erosion effects would be less intense under the preferred alternative. Impacts would still be potentially significant because of the overall extent of soil disturbance and potential for soil erosion, and implementation of Mitigation Measure GS-1 (*Implement construction measures to reduce soil erosion*) would reduce impacts to a less than significant level.

**Water Quality Impacts.** The hybrid version of the traditional riprap would require the placement of an estimated 19,610 cubic yards of fill, 5,920 cubic yards of backfill, 1,800 cubic yards of soil cover, 19,360 tons of quarry stone, and 8,190 tons of soil-filled quarry stone along the river bank and would require excavation of approximately 20,810 cubic yards along the gravel bar/river channel. The amount of material (primarily quarry stone) placed along the bank is less under the preferred alternative (54,880 tons) than the no berm (56,000 tons) and low berm (69,150 tons) options of Alternative 4. The riprap would extend about 100 feet from the bank, almost entirely on the gravel bar, similar to the no berm option, but would not extend as far into the river as the low berm option. Construction of the riprap

would have the same types of effects on water quality as described for Alternative 4 in the Draft EIS/EIR. The intensity of the effects would be less than those described for the low berm option because of the smaller quantity of material placed into the river and less than those described for the no berm option because of the smaller quantity of material being excavated (20,810 cubic yards under preferred compared with 66,000 cubic yards for no berm). Because of the need for some in-water activities, short-term increases in turbidity and suspended solids concentrations in the water column could violate the Basin Plan objectives for turbidity in the Sacramento River and affect beneficial uses, resulting in a significant impact. Implementation of Mitigation Measure WR-1 (*Implement measures to minimize increased turbidity levels in the Sacramento River during construction*) would reduce construction-related impacts on turbidity to a less than significant level.

Based on soil sampling and a phase I environmental site assessment conducted since the Draft EIS/EIR was published, no hazardous materials or contaminants have been identified in the project area or in soils that would be excavated as part of the bank protection installation or rock removal. No impacts from mercury-rich sediment are anticipated during project implementation, and mercury concentrations in the Sacramento River downstream of the project area would not be elevated as a result of the project.

**Fishery Impacts.** Construction of the riprap within the river channel for the preferred alternative would have the same types of effects on fisheries as described for Alternative 4 in the Draft EIS/EIR. As discussed above for water quality, the preferred alternative requires less excavation than the no berm option and would place less material into the river than the low berm option, which lowers the risk for erosion, sedimentation, and potential for accidental spills of hazardous materials into the Sacramento River. The riprap would extend about 100 feet from the bank, almost entirely on the gravel bar, similar to the no berm option, but would not extend as far into the river as the low berm option, which would lower the potential for direct mortality and injury to anadromous and resident fish, as well as disturbance to potential habitat (spawning, rearing, migratory) and associated critical habitat and essential fish habitat. The intensity of the effects associated with the preferred alternative would be less than those described for the low berm option because less material would be placed in the river channel and less than those described for the no berm option because of the smaller quantity of material being excavated. Similar to the low berm option, the preferred alternative provides a low berm to accommodate planting of natural riparian vegetation along the river and anchoring of large woody debris, which is not the case with the no berm option. Impacts associated with the preferred alternative would still be significant but implementation of Mitigation Measure WR-1 (*Implement measures to minimize increased turbidity levels in the Sacramento River during construction*), Mitigation Measure WR-2 (*Implement measures during construction and restoration activities to prevent accidental discharge of potential hazardous materials*), and Mitigation Measure FR-1 (*Implement measures to minimize the injury or mortality of rearing and migratory juvenile anadromous and resident fishes*) would reduce impacts to a less than significant level.

**Wetland Impacts.** The hybrid version of the traditional riprap associated with the preferred alternative would have a smaller permanent footprint than the traditional riprap with a low berm and a slightly larger permanent footprint than the traditional riprap without a berm, although the temporary area of disturbance would be the same. Less excavation would be needed for the preferred alternative toe trench compared with the traditional riprap without a berm, which would result in less excavation within the ordinary high

water mark of the Sacramento River. Temporary impacts to wetlands would be the same as Alternative 4 because of the same temporary disturbance area (7.2 acres of impacts to riparian wetlands and 12 acres of impacts to fresh emergent wetlands). The preferred alternative would result in permanent impacts to approximately 2.6 acres of jurisdictional wetlands on the gravel bar as a result of the traditional riprap, and the impacts associated with the cut-off channel would be the same as Alternative 4. Like the low berm option, the preferred alternative provides the key benefit of a low berm to allow for planting of natural riparian vegetation along the river, as well as natural regeneration, which would restore riparian wetlands to the area disturbed during construction. Because of the extent of impacts to wetlands and placement of fill material into the Sacramento River, impacts would be significant. Implementation of Mitigation Measure VW-2 (*Compensate for the loss of jurisdictional wetlands in the riparian restoration designs*) would reduce impacts to a less than significant level and ensure the project would not result in a net loss of wetlands.

**Special-Status Wildlife Impacts.** Construction activities associated with the preferred alternative would have the same types of effects on special-status wildlife species as described for Alternative 4 in the Draft EIS/EIR. The intensity of the effects for the preferred alternative would be slightly less than those described for both options of Alternative 4 because of the smaller quantity of material needed for the riprap, smaller quantity of material being excavated, and anticipated shorter construction schedule for the riprap installation based on these design details. Because of those factors, the duration of noise and other disturbance-related impacts on special-status wildlife, particularly nesting birds, and the extent of dust-related effects on the valley elderberry longhorn beetle would be less. Temporary habitat-related impacts, however, would be the same as Alternative 4 because of the same anticipated disturbance footprint. For the preferred alternative, riprap would not extend as far into the river as the low berm option, which would lower the potential for direct mortality to and injury of special-status aquatic amphibians and reptiles (western pond turtle). Similar to the low berm option, the preferred alternative provides a low berm to accommodate riparian and wetland vegetation along the river, which would provide nesting habitat for a variety of bird species, a place for elderberry shrubs (habitat for the valley elderberry longhorn beetle) to establish, and basking areas for western pond turtles.

Impacts associated with the preferred alternative would still be potentially significant because of the disturbance to habitat and associated special-status wildlife, and implementation of Mitigation Measure VW-4a (*Protect preserved elderberry shrubs during construction*), Mitigation Measure VW-4b (*Implement a mitigation plan for elderberry shrubs that must be removed*), Mitigation Measure VW-5 (*Conduct pre-construction surveys for nesting bank swallows and install netting along the bank*), and Mitigation Measure VW-6 (*Conduct pre-construction surveys for nesting special-status bird species, raptors, special-status mammals, and special-status reptiles*) would reduce impacts to a less than significant level.

**Air Quality Impacts.** Short-term construction emissions associated with the preferred alternative were calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1 (see Appendix B to this Final EIS/EIR). Emissions of reactive organic gases (ROG), nitrogen oxides (NO<sub>x</sub>), coarse particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), and greenhouse gases were quantified based on the estimated duration of construction activities, equipment use, and vehicle trips provided by River

Partners and Ayres Associates. These emissions were assessed for significance using the Butte County Air Quality Management District's (BCAQMD) recommended significance thresholds and applicable *de minimis* thresholds for the project area (see Chapter 3 of this Final EIS/EIR for additional discussion of the thresholds). A qualitative discussion of air quality impacts was presented in the Draft EIS/EIR, and the preferred alternative would result in the same types of impacts as discussed for Alternatives 3 and 4.

Based on the modeling that was conducted for the preferred alternative, construction activities associated with installation of the traditional riprap would generate maximum daily emissions that exceed the BCAQMD Level C significance thresholds for NO<sub>x</sub> and PM<sub>10</sub> (137 pounds per day [lbs/day]), and the highest emissions would be expected during winter months. Maximum daily emissions during winter were estimated at 14.06 lbs/day of ROG, 162.48 lbs/day of NO<sub>x</sub>, 174.63 lbs/day of PM<sub>10</sub>, and 6.85 lbs/day of PM<sub>2.5</sub>. Removal of the upstream rock would also result in daily emissions that exceed the BCAQMD's Level B significance threshold of 25 lbs/day for NO<sub>x</sub>, but none of the other thresholds would be exceeded. Restoration activities would not generate emissions that exceed BCAQMD significance thresholds. Construction activities (riprap installation and rock removal specifically) would result in significant air quality impacts, similar to Alternative 4 as described in the Draft EIS/EIR. Implementation of Mitigation Measure AQ-1 (*Implement a fugitive dust and emissions reduction plan*) would reduce maximum daily emissions below BCAQMD's Level C significance thresholds (riprap installation – 101.86 lbs of NO<sub>x</sub> per day, 120.98 lbs of PM<sub>10</sub> per day; rock removal – 32.66 lbs of NO<sub>x</sub> per day); therefore, construction-related air quality impacts would be reduced to a less than significant level. Based on the modeling, the maximum direct and indirect emissions associated with the preferred alternative would be 42.02 tons of NO<sub>x</sub> per year, which is below the General Conformity threshold, and a formal conformity determination is not required.

Based on the modeling, construction activities associated with the preferred alternative would generate approximately 913 metric tonne carbon dioxide equivalents (MTCO<sub>2e</sub>) (maximum annual greenhouse gas emissions). Implementation of Mitigation Measure AQ-1 (*Implement a fugitive dust and emissions reduction plan*) would reduce maximum greenhouse gas emissions to 873 MTCO<sub>2e</sub>. In addition, the planting of trees associated with the restoration activities would offset CO<sub>2</sub> emissions over the long term, as discussed in the Draft EIS/EIR. With the mitigation measure and restoration activities, impacts associated with greenhouse gas emissions would be less than significant.

## **1.4 Public Involvement During NEPA/CEQA Process**

In accordance with NEPA and CEQA requirements, the Service and CDFW have engaged the public and other agencies throughout the development of the EIS/EIR. A Notice of Intent (NOI) to prepare a joint EIS/EIR for the Riparian Sanctuary project was published in the Federal Register on April 12, 2011 (Volume 76, Number 70). The CDFW submitted a Notice of Preparation (NOP) to the State Clearinghouse on April 28, 2011. The NOI and NOP announced the scoping period, which extended from April 12 to May 27, 2011, and provided information on a public workshop, which was held on May 10, 2011, at the Ord Bend Community Hall near the project area. Additional information on the scoping process is available in Chapter 1 and Appendix A of the Draft EIS/EIR.

The Draft EIS/EIR was circulated to local, state, and federal agencies and to interested organizations and individuals for a 45-day public review period, beginning on May 4 and ending on June 25, 2012.

Agencies and interested parties were mailed a letter announcing availability of the Draft EIS/EIR, where the Draft EIS/EIR and supporting documents could be obtained or reviewed, the dates of the comment period, and the deadline for receiving written comments. The Service and CDFW held a public meeting on May 30, 2012, at the Ord Bend Community Hall near the project area, to solicit public comments on the document and respond to questions. Notices on the availability of the Draft EIS/EIR for review and on the public meeting were published in the Federal Register on May 4, 2012; the Willows Journal and Orland Press Register on May 26, 2012; and the Chico Enterprise on May 28, 29, and 30, 2012. The Notice of Completion of a Draft EIS/EIR was submitted to the State Clearinghouse with the required number of copies on May 4, 2012.

The Final EIS/EIR will be distributed to those who commented on the Draft EIS/EIR and others who have expressed interest in receiving copies of the document. It will also be filed with the State Clearinghouse and be made available to the public for review at the Service, CDFW, and PCGID-PID offices and local libraries, as listed in the Draft EIS/EIR. A notice of the availability of the Final EIS/EIR will be published in the Federal Register.

## **1.5 Decision Framework**

The Service is the federal lead agency under NEPA and will be responsible for issuing a Record of Decision to identify the selected alternative and measures that will be adopted to avoid or minimize environmental impacts. The Service is also responsible for consultations under the federal Endangered Species Act and National Historic Preservation Act, which will be completed prior to signing the Record of Decision. CDFW is the state lead agency under CEQA and will be responsible for certifying the Final EIR and issuing findings for the Riparian Sanctuary project. Other agencies have responsibilities to issue permits or other authorizations for the project, as listed in Section 1.5.2 of the Draft EIS/EIR, and the agencies and PCGID-PID will coordinate all necessary approvals prior to project implementation.

# Chapter 2 Responses to Comments

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This chapter contains the comments received during the public review period for the Draft EIS/EIR and responses to those comments.

## 2.1 Introduction

Comments received on the Draft EIS/EIR do not indicate new significant impacts or “significant new information” that would require recirculation of the Draft EIS/EIR pursuant to California Environmental Quality Act Guidelines Section 15088.5. Because no new significant environmental issues were raised during the 45-day comment period for the Draft EIS/EIR, the lead agencies directed that a Final EIS/EIR be prepared.

## 2.2 List of Commenters

Table 2-1 lists agencies who submitted comments on the Draft EIS/EIR.

**Table 2-1. List of Commenters**

Comment Letter No.	Commenter	Date of Letter
Letter 1	James Herota, Staff Environmental Scientist, Flood Projects Improvement Branch, Central Valley Flood Protection Board	June 4, 2012
Letter 2	Cy R. Oggins, Chief, Division of Environmental Planning and Management, California State Lands Commission	June 18, 2012
Letter 3	Kathleen Martyn Goforth, Manager, Environmental Review Office (CED-2), U.S. Environmental Protection Agency	June 25, 2012
Letter 4	Noel Lerner, Chief, Flood Maintenance Office, California Department of Water Resources	June 25, 2012

## 2.3 Comments and Responses

The four letters commenting on the Draft EIS/EIR are reproduced on the following pages. Responses to comments follow each comment letter. To assist in referencing comments and responses, each letter has been assigned a number, based on the date the letter was received, and each specific comment was assigned a letter of the alphabet. Responses correspond with the codes used in the margin of the comment letters. If changes to the Draft EIS/EIR text were necessary in response to the comments, those changes are shown in Chapter 3 of this Final EIS/EIR. Comments that present opinions about the project or that raise issues not directly related to the substance of the Draft EIS/EIR are noted without a detailed response.

In addition to the comment letters received, the agencies held a public meeting on May 30, 2012 to solicit feedback and answer questions on the document. The sign-in sheet for this meeting is provided at the end of this chapter, following the comment letters. Attendees at the meeting generally expressed support for the project because of its benefits to water users and the improvements to the Riparian Sanctuary with habitat restoration. Questions were asked about the design details, how the project would be funded, and what the effects on upstream properties might be. No specific comments on the Draft EIS/EIR were received at the public meeting.

**CENTRAL VALLEY FLOOD PROTECTION BOARD**

3310 El Camino Ave., Rm. 151  
SACRAMENTO, CA 95821  
(916) 574-0609 FAX: (916) 574-0682  
PERMITS: (916) 574-2380 FAX: (916) 574-0682



June 4, 2012

Ms. Tracy McReynolds  
California Department of Fish and Game  
629 Entler Avenue, Suite 12  
Chico, California 95928

Subject: Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Protection Project  
SCH Number: 2011042102  
Document Type: Environmental Impact Report

Dear Ms. McReynolds:

Staff of the Central Valley Flood Protection Board (Board) has reviewed the subject document and provides the following comments:

The proposed project is located within the regulated area(s) or stream(s), the Sacramento River, which is under the jurisdiction of the Central Valley Flood Protection Board. The Board is required to enforce standards for the construction, maintenance and protection of adopted flood control plans that will protect public lands from floods. The jurisdiction of the Board includes the Central Valley, including all tributaries and distributaries of the Sacramento River and the San Joaquin River, and designated floodways (Title 23 California Code of Regulations (CCR), Section 2).

A Board permit is required prior to starting the work within the Board’s jurisdiction for the following:

- The placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee (CCR Section 6);
- Existing structures that predate permitting or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the encroachment has not been clearly established or ownership and use have been revised (CCR Section 6);
- Vegetation plantings will require the submission of detailed design drawings; identification of vegetation type; plant and tree names (i.e. common name and scientific name); total number of each type of plant and tree; planting spacing and irrigation method that will be utilized within the project area; a complete vegetative management plan for maintenance to prevent the interference with flood control, levee maintenance, inspection, and flood fight procedures (CCR Section 131).

1a

Ms. Tracy Mc Reynolds  
June 4, 2012  
Page 2 of 2

Vegetation requirements in accordance with Title 23, Section 131 (c) states "Vegetation must not interfere with the integrity of the adopted plan of flood control, or interfere with maintenance, inspection, and flood fight procedures."

The accumulation and establishment of woody vegetation that is not managed has a negative impact on channel capacity and increases the potential for levee over-topping. When a channel develops vegetation that then becomes habitat for wildlife, maintenance to initial baseline conditions becomes more difficult as the removal of vegetative growth is subject to federal and State agency requirements for on-site mitigation within the floodway.

Hydraulic Impacts - Hydraulic impacts due to encroachments could impede flood flows, reroute flood flows, and/or increase sediment accumulation. The Project should include measures for channel and levee improvements and maintenance to prevent and/or reduce hydraulic impacts. Off-site mitigation outside of the State Plan of Flood Control should be used when mitigating for vegetation removed within the project location.

The permit application and Title 23 CCR can be found on the Central Valley Flood Protection Board's website at <http://www.cvfpb.ca.gov/>. Contact your local, federal and State agencies, as other permits may apply.

If you have any questions, please contact me by phone at (916) 574-0651, or via email at [jherota@water.ca.gov](mailto:jherota@water.ca.gov).

Sincerely,



James Herota  
Staff Environmental Scientist  
Flood Projects Improvement Branch

cc: Governor's Office of Planning and Research  
State Clearinghouse  
1400 Tenth Street, Room 121  
Sacramento, California 95814

1b

### 2.3.1 Responses to Letter 1 Comments

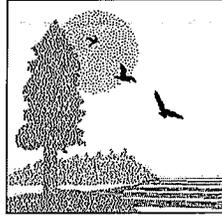
- 1a An application will be submitted to the Central Valley Flood Protection Board for a permit to construct the Riparian Sanctuary project. The application will include detailed designs for the proposed revetment, restoration plan, and removal of upstream rock and other information required by the Board.
- 1b Impact WR-5 (Implementation of the Riparian Sanctuary project could modify flood flows through the project area as a result of the change in the Sacramento River channel and restoration activities and expose people, property, or structures to flood risks) in the Draft EIS/EIR (pages 3-46 to 3-47) discusses the potential for the Riparian Sanctuary project to modify flood flows along the Sacramento River, across the Riparian Sanctuary, and in the Butte Basin. A 2-dimensional hydraulic model study and sediment transport analysis were conducted to assess potential changes in flood flows along the Sacramento River and in the Butte Basin. The slight increases were seen more in the Butte Basin rather than in the leveed section of the Sacramento River. These changes would not impede flood flows, increase sediment accumulation, or affect the ability of the State to implement flood fight procedures.

Upon discussion with Board engineers, a sediment transport analysis was conducted for the Riparian Sanctuary project (the memorandum discussing the analysis results is included in Appendix B to the Draft EIS/EIR). The analysis demonstrated that the project would result in very little sediment transport. The affected reach of the Sacramento River is not sediment laden, like other reaches or tributaries. The contributions to sediment transport would primarily be from the upstream rock removal and resulting cut-off channel that forms naturally over time, which would contribute sediment to the river gradually over time as the river modifies its alignment. In addition, the cut-off channel is predicted to occur naturally over a longer period of time without the rock removal, as demonstrated by the existing scour holes behind the existing revetment.

Regarding maintenance responsibilities, the Service will be responsible for vegetation management on the Riparian Sanctuary, PCGID-PID will be responsible for maintenance of the revetment, and the State or Corps will continue to be responsible for other levees and revetment along the Sacramento River in the project vicinity. A road will be maintained along the north end of the Riparian Sanctuary Unit for long-term monitoring and maintenance of the project. The Sacramento River NWR has a strong track record of working with local levee districts on assisting them with the maintenance of flood control levees (i.e., firebreaks, vegetation management, and levee burn operations). In the event of the need to remove vegetation and sediment to maintain the State's Plan for Flood Control, the Service will be responsible for environmental compliance (e.g., NEPA, Endangered Species Act) for activities at the Riparian Sanctuary Unit of the Sacramento River NWR.

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**CALIFORNIA STATE LANDS COMMISSION**  
100 Howe Avenue, Suite 100-South  
Sacramento, CA 95825-8202



**CURTIS L. FOSSUM**, Executive Officer  
(916) 574-1800 FAX (916) 574-1810  
California Relay Service From TDD Phone 1-800-735-2929  
from Voice Phone 1-800-735-2922

Contact Phone: (916) 574-1900  
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June 18, 2012

File Ref#: SCH 2011042102

Tracy McReynolds  
California Department of Fish and Game  
629 Entler Ave, Suite 12  
Chico, CA 95928

**SUBJECT: Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Proposed Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Protection Project located in Butte and Glenn Counties.**

Dear Mrs. McReynolds:

The California State Lands Commission (CSLC) staff has reviewed the subject Draft EIS/EIR for the proposed Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Protection Project (Project), which is being prepared by the California Department of Fish and Game (DFG) and the U.S. Fish and Wildlife Service (USFWS). DFG, as the public agency proposing to carry out the Project, is the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). USFWS is the lead agency under the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321 as amended. The CSLC is designated as a trustee agency because of its trust responsibility for projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters. Because the Project involves work within sovereign lands, the CSLC will also act as a responsible agency.

2a

**CSLC Jurisdiction and Public Trust Lands**

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the Common Law Public Trust.

2b

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of

all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. On navigable non-tidal waterways, including lakes, the State holds fee ownership of the bed of the waterway landward to the ordinary low water mark and a Public Trust easement landward to the ordinary high water mark, except where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections.

After review of the information contained in the Draft EIS/EIR, a portion of the Sacramento River, over which the Project would extend, includes State-owned sovereign land. A lease and formal authorization for the use of sovereign land will be required from the CSLC for the portion of the Project encroaching on State-owned lands.

### **Project Description and Location**

The 950-acre Llano Seco Riparian Sanctuary is located 15 miles southwest of Chico on the east bank of the Sacramento River between River Mile 176.5 and River Mile 178 in the southwest corner of Butte County. The Project area discussed in the Draft EIS/EIR encompasses approximately 400 acres in the northern portion of the Llano Seco Riparian Sanctuary, a peninsula north of the Riparian Sanctuary, and the banks of the Sacramento River adjacent to and just upstream of the Riparian Sanctuary (between RM 178 and RM 180). The peninsula across from the Llano Seco Riparian Sanctuary contains federal (Llano Seco Island 2 refuge unit), state, and private lands, which are in Butte and Glenn counties. The Llano Seco Riparian Sanctuary and Llano Seco Island are part of the Sacramento River National Wildlife Refuge (NWR), a refuge managed by the USFWS as part of the Sacramento NWR Complex.

### **Environmental Review**

Because the CSLC will need to rely on the EIS/EIR for issuance of a lease, the Division of Environmental Planning and Management (DEPM) staff requests the DFG consider the following comments and suggestions and incorporate appropriate revisions into the final EIS/EIR.

1. **Hazards and Hazardous Materials**: As stated in Section 3.4.3, Affected Environment page 3-40:

*The segment of the Sacramento River between Hamilton City and Knights Landing is listed as a 303(d) impaired water body for mercury from an unknown source. Mercury may be present in streambed sediments in the project vicinity, although the concentration of mercury is likely low.*

*Disturbance of streambed sediments for spur dike construction could mobilize and transport sediment bound mercury. Mercury tends to adhere to fine-grained*



2b

*sediments, which compose approximately 10 percent of the streambed sediments in this segment of the Sacramento River.*

Also stated in Section 3.4.3, Affected Environment page 3-42:

*Under Alternative 4 (preferred alternative), impacts related to the construction of traditional riprap, with or without the low berm, and site-specific planting would be the same as described for Alternatives 2 and 3. Water quality impacts associated with increased mercury levels during construction and soil and other environmental impacts from mercury in stockpiled sediments would be significant. Implementation of Mitigation Measure WR-1, described for Impact WR-1, and Mitigation Measure WR-2, described for Alternative 3, would reduce mercury-related impacts from the traditional riprap and restoration on water quality, soils, and beneficial uses of the Sacramento River to a less-than-significant level.*

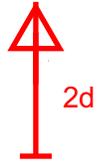
*The additional rock removal and the potential re-use of the rock in the traditional riprap and to protect the private property west of the Drainage District property would increase the potential for mercury to contaminate water quality, soils, and the environment. The removal of the upstream revetment would disturb and mobilize fine sediment that may contain mercury and increase mercury concentrations in downstream water quality.*

Before any revetment removal, dredging or ground-breaking activities can begin; a Phase I and Phase II Environmental Site Assessment (ESA Phase I & II) should be conducted to ensure the sediments and soils associated with the revetment removal have been tested for mercury and other analytes associated with hazardous materials. The analysis is covered under the California Code of Regulations, Title 22, Division 4.5. CSLC staff will review the analysis reports prior to CSLC action on a lease. Appropriate analyses should be completed prior to any ground breaking activity. If either of these reports has been prepared during the EIS/EIR process, please provide them to DEPM staff to review.

CSLC staff also recommends implementation of avoidance and minimization measures to reduce potential release of mercury and other toxins into waterways from Project activities. On April 22, 2010, the Central Valley Regional Water Quality Control Board (RWQCB) identified the CSLC as both a State agency that manages open water areas in the Sacramento-San Joaquin Delta Estuary and a nonpoint source discharger of methylmercury (Resolution No. R5-2010-0043), because subsurface lands under the CSLC's jurisdiction are impacted by mercury from legacy mining activities dating back to California's Gold Rush. Pursuant to a RWQCB Total Maximum Daily Load (TMDL), the RWQCB is requiring the CSLC, the Department of Water Resources, and the Central Valley Flood Protection Board to secure adequate resources to fund studies to identify potential methylmercury control methods in the Delta and to participate in an Exposure Reduction Program. The goal of the studies is to evaluate existing control methods and evaluate options to reduce methylmercury in open waters under jurisdiction of the CSLC. Consequently, any



action taken that may result in continued mercury and methylmercury moving from upstream areas to the Sacramento-San Joaquin Delta Estuary may affect the CSLC's efforts to comply with the RWQCB TMDL.



Climate Change

2. Sea Level Rise: The DFG should consider the effects of sea level rise on all resource categories potentially affected by the proposed Project. At its meeting on December 17, 2009, the CSLC approved the recommendations made in a previously requested staff report, "A Report on Sea Level Rise Preparedness" (Report), which assessed the degree to which the CSLC's grantees and lessees have considered the eventual effects of sea level rise on facilities located within the CSLC's jurisdiction. (The Report can be found on the CSLC's website, <http://www.slc.ca.gov>). One of the Report's recommendations directs CSLC staff to consider the effects of sea level rise on hydrology, soils, geology, transportation, recreation, and other resource categories in all environmental determinations associated with CSLC leases.



Please note that, when considering lease applications, CSLC staff is directed to (1) request information from applicants concerning the potential effects of sea level rise on their proposed projects, (2) if applicable, require applicants to indicate how they plan to address sea level rise and what adaptation strategies are planned during the projected life of their projects, and (3) where appropriate, recommend project modifications that would eliminate or reduce potentially adverse impacts from sea level rise, including adverse impacts on public access.

3. Greenhouse Gases: The Draft EIS/EIR concludes that Greenhouse Gas (GHG) emissions resulting from the Project would be less than significant. However, the analysis and discussion do not contain information sufficient to support this conclusion, such as the type and number of equipment vehicles needed, the number of vehicle trips expected, or any other pertinent information related to estimating the amount of GHG emissions and the significance of those emissions. In order to more adequately support the conclusion reached in the EIS/EIR, DFG should include a GHG analysis that is consistent with the California Global Warming Solutions Act (AB 32) and required by section 15064.4 of the State CEQA Guidelines<sup>1</sup> in a revised EIS/EIR. This discussion should include a complete accounting of the emission sources, a quantitative or qualitative estimate of GHG emissions, and how those GHG emissions from the Project compare to the Butte County Air Quality Management District (BCAQMD) emission standards. Please provide a complete and thorough analysis of all air quality criteria pollutants identified in the *CEQA Air Quality Handbook: Guidelines for Assessing Air Quality Impacts for Projects Subject to CEQA Review*, found at the BCAQMD website: <http://www.bcaqmd.org/page/clean-air-plan-and-ceqa.php>.



<sup>1</sup> The State "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

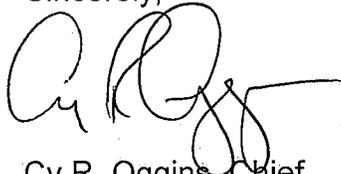
The planting of riparian trees will have the offsetting capacity over the long-term construction activities for the project's Environmentally Superior Alternative (Alternative 4). The California Air Resources Board (CARB) has developed and adopted the *Compliance Offset Protocol Urban Forest Projects* provides methods to quantify and report GHG removal enhancements associated with a planned set of tree planting and maintenance activities to permanently increase carbon storage in trees. The Project proposes to plant riparian trees and vegetation during the restoration of Llano Seco Riparian Sanctuary. This offset would reduce the footprint of the planned construction activities.

2g

Thank you for the opportunity to comment on the Draft EIS/EIR for the Project. As a responsible agency, the CSLC will need to rely on the adopted EIS/EIR for the issuance of any new lease as specified above and, therefore, we request that you consider our comments when finalizing the EIS/EIR. Please send additional information on the Project to the CSLC as plans become finalized.

Please send copies of future Project-related documents, including an electronic copy of the approved EIS/EIR, Mitigation Monitoring Program, and Notice of Determination when they become available. If you have any questions regarding the Public Trust or the Lease Application process, please feel free to call Reid Boggiano, Public Lands Management Specialist, at [reid.boggiano@slc.ca.gov](mailto:reid.boggiano@slc.ca.gov) or (916) 574-0450. If you have any questions regarding the environmental concerns for the proposed project, please feel free to call Christopher Huitt, Staff Environmental Scientist, at [christopher.huitt@slc.ca.gov](mailto:christopher.huitt@slc.ca.gov) or (916) 574-1938.

Sincerely,



Cy R. Oggins, Chief  
Division of Environmental Planning  
and Management

cc: Office of Planning and Research (OPR)  
Reid Boggiano, LMD, CSLC  
Christopher Huitt, DEPM, CSLC  
Eric Milstein, Legal, CSLC

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### 2.3.2 Responses to Letter 2 Comments

- 2a Comment acknowledged.
- 2b An application for a lease and formal authorization from the California State Lands Commission will be submitted prior to work in the Sacramento River.
- 2c A Phase I Environmental Site Assessment was conducted for the entire project area in accordance with *ASTM E1527-05* (Phase 1 Environmental Site Assessment for the Llano Seco Riparian Sanctuary, prepared by Matt Hamman, U.S. Fish and Wildlife Service, December 12, 2012). The assessment indicated that a natural gas pipeline is buried at least 4 feet below the ground surface through the middle of the Riparian Sanctuary, but no evidence of hazardous contaminants was found during a site reconnaissance or background research. Soil samples were also analyzed along the river in areas with new revetment will be installed and existing revetment will be removed (Soil/Sediment Sampling and Analytical Report, prepared by Broadbent and Associates, Inc., December 11, 2012). Concentrations of metals and other chemicals evaluated in the lab were low, and mercury, as well as several other chemicals, was not detected in the three soil samples from the project area. Copies of the reports will be provided to the California State Lands Commission as part of the lease application and are available upon request from the Service. Based on these results, Mitigation Measure WR-2 was determined not to be applicable and is removed from the mitigation requirements for the project in Chapter 3 of this Final EIS/EIR.
- 2d Mitigation Measure WR-1 in the Draft EIS/EIR (page 3-37 to 3-39) identifies avoidance and minimization measures to reduce turbidity and discharge of pollutants into the Sacramento River during construction. Based on soil sampling in the project area (see response to Comment 2c), mercury and other hazardous materials are not a concern in the project area, and additional mitigation measures are not required. The Riparian Sanctuary project would not affect the State Lands Commission's ability to comply with the Total Maximum Daily Load for methylmercury issued by the Regional Water Quality Control Board.
- 2e The California State Lands Commission report titled "A Report on Sea Level Rise Preparedness" was reviewed to obtain guidance on how to address effects of sea level rise on the Riparian Sanctuary project. The project area is located at elevations of 60 to 102 feet above mean sea level and is not in or near the coast; therefore, it would not be directly affected by sea level rise. The proposed revetment would be installed in and along the Sacramento River, a navigable river under the jurisdiction of the State Lands Commission; however, the effects of sea level rise on the Sacramento River upstream of the Sacramento-San Joaquin Delta are not known. The report predicts sea levels to rise about 16 inches by 2050, which would happen during the life of the Riparian Sanctuary project. This amount of sea level rise as a result of climate change could affect storm events and flood flows along the coast and in inland areas, but specific effects along the Sacramento River have not been predicted by the Commission. Flood events would be expected to continue as they have historically, and the proposed revetment has been designed with consideration for historic flood events, particularly the 100-year flood. The proposed

revetment and other aspects of the Riparian Sanctuary project would not be affected by sea level rise based on currently available information.

- 2f The discussion of impacts relating to greenhouse gas emissions has been expanded in Chapters 1 and 3 of this Final EIS/EIR (see also Appendix B). Please note that Impact AQ-1 (Construction-related emissions) was determined to be significant, and mitigation measures were identified to reduce construction emissions and fugitive dust associated with ground disturbing activities to less than significant.
- 2g Comment acknowledged. The agencies agree that the restoration plan would offset greenhouse gas emissions over the long term. No changes to the Draft EIS/EIR are necessary.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

Letter 3

June 25, 2012

Daniel W. Frisk, Project Leader  
Sacramento National Wildlife Refuge Complex  
U.S. Fish and Wildlife Service  
752 County Road 99W  
Willows, California 95988

Subject: Draft Environmental Impact Statement (DEIS), Llano Seco Riparian Sanctuary Unit  
Restoration and Pumping/Fish Screen Facility Protection Project, Glenn and Butte Counties,  
California (CEQ # 20120133)

Dear Mr. Frisk:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. Our detailed comments are enclosed.

According to the DEIS, the FWS, in coordination with the California Department of Fish and Game, proposes to restore riparian habitat at the Llano Seco Riparian Sanctuary Unit of the Sacramento River National Wildlife Refuge and to protect the alignment of the Sacramento River at the water diversion for the Princeton-Cordora-Glenn and Provident Irrigation District's (PCGID-PID) pumping plant and fish screen facility. Restoration would consist of removing non-native and invasive plants, cleaning up flood debris, and planting native species. Bank protection measures of the Preferred Alternative 4 would consist of traditional riprap and removal of the existing revetment on a peninsula upstream of the facility.

Based on our review, we have rated the DEIS's preferred alternative as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions"). This rating reflects the lack of information regarding air quality impacts and conformity with the State Implementation Plan for the attainment of the National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter less than 2.5 microns (PM<sub>2.5</sub>). Additionally, we found the alternatives analysis confusing due to the inclusion of two variants of the preferred alternative. Impacts differ for these variants yet these impacts are not clearly differentiated in the alternatives analysis in the DEIS, nor is it clear which variant represents the preferred alternative.

We recommend a clearer disclosure of direct and indirect impacts to wetlands; additional information regarding how the use of herbicides will follow an integrated pest management approach; and clarification regarding impacts to cultural resources and tribal consultation. We also request consideration of the recommendation made in our scoping comments to evaluate bioengineered design techniques for natural bank stabilization. Since our scoping comments may not have been received by the FWS, we are appending them to this letter.

3a

EPA appreciates the opportunity to review this DEIS. When the Final EIS is released for public review, please send one copy to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or contact Karen Vitulano, the lead reviewer for this project, at 415-947-4178 or [vitulano.karen@epa.gov](mailto:vitulano.karen@epa.gov).

Sincerely,



Kathleen Martyn Goforth, Manager  
Environmental Review Office (CED-2)

Enclosure: Summary of EPA Rating Definitions  
EPA's Detailed Comments  
EPA Scoping Comments

cc: Tracy McReynolds, California Department of Fish and Game  
Butte County Air Quality Management District  
Mechoopda Indian Tribe of Chico Rancheria  
Berry Creek Rancheria of Maidu Indians of California  
Greenville Rancheria of Maidu Indians of California  
Grindstone Indian Rancheria of Wintun-Wailaki Indians of California  
Mooretown Rancheria of Maidu Indians of California  
Paskenta Band of Nomlaki Indians of California

# **SUMMARY OF EPA RATING DEFINITIONS\***

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

## **ENVIRONMENTAL IMPACT OF THE ACTION**

### ***“LO” (Lack of Objections)***

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

### ***“EC” (Environmental Concerns)***

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

### ***“EO” (Environmental Objections)***

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

### ***“EU” (Environmentally Unsatisfactory)***

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

## **ADEQUACY OF THE IMPACT STATEMENT**

### ***Category “1” (Adequate)***

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

### ***Category “2” (Insufficient Information)***

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

### ***Category “3” (Inadequate)***

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

\*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

**Alternatives Analysis**

The DEIS identifies two variants of Alternative 4: a low berm option and a no berm option. Impacts of these two variants differ and the impact assessment does not clearly differentiate between them in the alternative analysis. In addition, while Alternative 4 is identified as the preferred alternative, it is not clear if this refers to the low berm or the no berm option.

*Recommendation:* We recommend that the Final EIS differentiate between these variants of Alternative 4, perhaps splitting them into two distinct alternatives. Ensure that impacts of the two variants are clearly distinguished, as required by the Council on Environmental Quality’s (CEQ) NEPA regulations at 40 CFR 1502.14.

3b

**Air Quality**

The project area straddles Butte and Glenn Counties, and Butte County is in nonattainment for the National Ambient Air Quality Standards (NAAQS) for 8-hour ozone and particulate matter less than 2.5 microns (PM<sub>2.5</sub>). The DEIS identifies the General Conformity Rule and states that the project is expected to conform “because it is not expected to result in annual emissions above the de minimus rates for which Butte or Glenn County are in nonattainment status” (p. 3-141). However, no emissions estimates are included to demonstrate that levels would be below de minimus rates. The DEIS indicates that approximately 600 trips by 20-ton trucks are anticipated to be needed to haul approximately 12,160 tons of material. Up to six trucks would be expected per hour, resulting in about 25–30 trucks per day accessing the project area (p. 3-137). Alternatives 3 and 4 would require about four to six times as many haul trips for transporting materials for the riprap (approximately 2,300 trips for 46,000 tons of material without a low berm; approximately 3,460 trips for 69,150 tons of material with a low berm). According to the DEIS, these trips can be reduced for Alternative 4 if upstream rock can be reused downstream (p. 3-138). Because of the way the information is presented, the quantity of truck trips presented in the DEIS is not completely clear.

3c

Mitigation measures are identified primarily for dust control, although three discuss reducing vehicle and equipment exhaust: limiting vehicle idling to 5 minutes; maintaining equipment; and using diesel equipment meeting ARB’s 1996 or newer certification standard. Because of the ozone nonattainment status, the use of newer vehicles should be pursued.

3d

*Recommendations:* In the FEIS, identify the expected truck trips in a table format for each alternative, including the 2 variants of Preferred Alternative 4.

Include estimates of emissions for each alternative, including the 2 variants for Alternative 4. Emissions that would be generated in nonattainment areas should be compared to the de minimus thresholds. If the estimates are above de minimus levels for oxides of nitrogen (NOx), volatile organic compounds (VOCs), or PM<sub>2.5</sub>, the FEIS should include a commitment to conduct a full general conformity determination prior to the Record of Decision.

3c  
(cont)

Consider additional mitigation measures for the reduction of vehicle and equipment exhaust. We recommend the following:

- Commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible<sup>1</sup>. Lacking availability of non-road construction equipment that meets Tier 4 engine standards, the responsible agency should commit to using CARB and EPA-verified particulate traps, oxidation catalysts and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site.
- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;
- Develop a construction traffic and parking management plan that maintains traffic flow, and plan construction to minimize vehicle trips; and
- Identify sensitive receptors in the project area, such as children, elderly, and the infirmed, and ensure construction equipment and staging zones are located away from any sensitive receptors.

3d  
(cont)

### Wetlands

The DEIS does not acknowledge EPA’s scoping comments (letter dated May 26, 2011; copy enclosed) on the project proposal (p. 1-13). In our scoping comments, we encouraged FWS to incorporate natural bank stabilization and protection measures in the alternatives analysis. Stabilizing banks with natural vegetation provide for better water quality and fish and wildlife habitats. Natural bank stabilization and protection measures include use of native vegetation and bioengineered design techniques (e.g., use of willow plantings, root wads, and large woody debris). A combination of native vegetation and bioengineered design techniques used in conjunction with hard-armoring (e.g. rip-rap) can help create a more natural bank that is effective at protecting against bank erosion and provides long-term stability. It does not appear that bioengineered design techniques were considered in the alternatives analysis and we continue to recommend that FWS consider their merits.

3e

The disclosure of impacts to wetlands and waters of the U.S. from the alternatives is not completely clear. The DEIS implies there will be impacts as a result of the river cut-off expected to occur under Alternative 4 after approximately 5 years, but there is no further discussion of these impacts except that they would be the result of natural processes and would not require additional Section 404 permitting (p. 3-110).

3f

*Recommendations:* Consider natural bank stabilization techniques and incorporate these, as appropriate, into the project alternatives. If these techniques are not considered feasible for the project and were eliminated from detailed study, briefly discuss the reasons for their having been eliminated (40 CFR 1502.14(a)).

3e  
(cont)

Include a table comparing impacts to wetlands and waters of the U.S. in the Final EIS to better disclose impacts. Include estimates of the acreage of wetlands that would be directly affected by the

3f  
(cont)

<sup>1</sup> Diesel engines < 25 hp rated power started phasing in Tier 4 Model Years in 2008. Larger Tier 4 diesel engines will be phased in depending on the rated power (e.g., 25 hp - <75 hp: 2013; 75 hp - < 175 hp: 2012-2013; 175 hp - < 750 hp: 2011 - 2013; and ≥ 750 hp 2011- 2015).

project alternatives and of the acreage expected to experience indirect effects from the change in hydrology that the project will facilitate.

3f  
(cont)

### Use of Herbicides

The DEIS indicates that areas with non-native plants would be sprayed with herbicides (p. 2-11) and that all herbicide application would strictly adhere to the Sacramento River National Wildlife Refuge (NWR) Integrated Pest Management (IPM) Plan (p. 3-44). We were unable to find the Sacramento River NWR IPM Plan online<sup>1</sup> and it is unclear how the IPM plan will influence project decision-making. EPA supports an IPM approach where non-chemical and least toxic methods are considered first.

Mitigation Measure WTR-3 states that basal and foliar application of herbicides will be prohibited within 100 feet of the Sacramento River but does not indicate what methods would be used to treat non-native plants within 100 feet of the river.

The DEIS identifies several herbicides that may be used including Roundup (glyphosate), 2,4-D, Milestone (for milk thistle control), Rodeo (for areas adjacent to water bodies), Garlon (for woody species control), and Habitat/Polaris (for giant reed control) (p. 2-11). Disposal of treated vegetation is not discussed, but we note that Milestone’s active ingredient aminopyralid is persistent and vegetation killed with this product cannot be composted for future use as a soil amendment. The Milestone label includes instructions for proper handling of treated plant residue.

3g

Some herbicides identified above have formulations for aquatic application and it is not clear if application to surface waters would occur for the project. If application to surface waters would occur, FWS must obtain coverage under the State of California's National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit<sup>2</sup>.

*Recommendations:* In the Final EIS, expand upon the creation/use of an IPM Plan for the project and how decisions would be made for weed management and preparing the site for restoration plantings. If the IPM hierarchy would be employed, discuss non-chemical means that might be effective for site preparation. Discuss how areas within 100 feet of the Sacramento River would be treated and the feasibility of using non-chemical means on additional areas. Where it is determined that herbicide use would be necessary, discuss how the decision would be made on which product to use, how vegetation waste treated with persistent herbicides would be disposed, and whether application to surface waters would occur and for which species. If water application is expected, identify how FWS would comply with Clean Water Act requirements.

### Consultation with Tribes and Impacts to Cultural Resources

Most agencies choose to include the National Historic Preservation Act (NHPA) consultation under the “NEPA umbrella”; however, the DEIS states that the analysis in the document is not meant to provide determination of effects on historic properties pursuant to Section 106 of the National Historic Preservation Act (p. 3-130) and that the FWS will conduct a separate analysis. Consultation with tribes

3h

<sup>1</sup> The Sacramento River NWR Comprehensive Conservation Plan does not include step-down management plan for IPM. It references only the Sacramento Refuge Complex’s draft IPM Plan for Mosquito Control and the draft IPM plan that specifically addresses walnut orchards.

<sup>2</sup> See [http://www.waterboards.ca.gov/water\\_issues/programs/npdes/aquatic.shtml](http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml)

is only briefly mentioned. The DEIS states that the FWS re-initiated consultation with three local tribes in the form of a letter, and that only the Mechoopda responded, received a site visit, and asked to review the restoration plan. The DEIS did not reveal the names of the other two tribes, nor identify any follow-up activities to ensure the consultation letters were received. The DEIS identifies prehistoric site CA-BUT-2658 as likely eligible for listing in the National Register of Historic Places and identifies 9 isolated finds recorded at the Sanctuary but states that isolated finds are “generally not eligible for listing in the National Register” (p. 3-129). In addition, the DEIS states that human remains are known to be on the site (p. 3-131) but no further information is provided.

The benefits of aligning the NEPA and NHPA Section 106 reviews are that the findings of each process can inform the other and key relevant information is revealed early in decision-making. In addition, information raised in consultation with Indian tribes can be considered during the development of alternatives and assessment of impacts.

*Recommendations:* Include additional discussion in the Final EIS regarding the future NHPA Section 106 consultation including any updates since publication of the DEIS, any communications with the State Historic Preservation Officer, an estimated schedule for completion, and how information from the consultation will be incorporated into NEPA decision-making. By statute, the Section 106 requirements must be met “prior to” an agency’s final decision.

Identify, in the FEIS, the tribes to which consultation letters were sent, and confirm that the letters were received. Updates concerning tribal consultation and concerns should be included in the FEIS. We recommend FWS consider consultation with the six federally-recognized tribes identified by the Native American Heritage Commission in their scoping comments or include a discussion in the FEIS as to why consultation was not deemed necessary.

Disclose additional information regarding impacts to cultural resources, including the location of the prehistoric site CA-BUT-2658 in relation to the project site (if this is not confidential); discussion of the quality of the isolated finds and circumstances under which they would be considered eligible for listing; and clarification regarding the presence of human remains such as how they are known to be onsite and their location in relation to project disturbance. We recommend that FWS pursue listing of CA-BUT-2658 on the National Register.

3h  
(cont)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

May 26, 2011

Daniel W. Frisk, Project Leader  
Sacramento National Wildlife Refuge Complex  
U.S. Fish and Wildlife Service  
752 County Road 99W  
Willows, California 95988

Subject: Scoping Comments for Llano Seco Riparian Sanctuary Unit Restoration and Pumping/Fish Screen Facility Protection Project, Glenn and Butte Counties, California

Dear Mr. Frisk:

The U.S. Environmental Protection Agency has reviewed the Federal Register Notice published on April 12, 2011 requesting comments on the U.S. Fish and Wildlife Service's (FWS) Notice of Intent (NOI) to prepare an Environmental Impact Statement for the subject project. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

The FWS, in coordination with the California Department of Fish and Game, proposes to restore approximately 500 acres of the Llano Seco Riparian Sanctuary Unit to improve habitat for wildlife and to address the erosion of the natural riverbank across from the Princeton-Cordora-Glenn and Provident Irrigation Districts (PCGID-PID) pumping plant and fish screen facility. Continued bank erosion will change the angle of flow and velocity of the water passing the screens, trapping fish against the screen rather than sweeping them past. Without some type of protection, it is likely the bank will continue to erode and the pumping plant facility will fail to meet National Marine Fisheries Service guidelines for operation of the fish screens.

The NOI indicates that a full range of reasonable alternatives will be developed based on the River Partners 2005 feasibility study, the 2010 feasibility study prepared by Ayres Associates, and public input. EPA encourages FWS to incorporate natural bank stabilization and protection measures in the alternatives analysis. Natural bank stabilization and protection measures include use of native vegetation and bioengineered design techniques (e.g., use of willow plantings, root wads, and large woody debris). A combination of native vegetation and bioengineered design techniques used in conjunction with hard-armorings (e.g. rip-rap) can help create a more natural bank that is effective at protecting against bank erosion and provides long-term stability.

EPA appreciates the opportunity to comment on this NOI. Once the DEIS is released for public review, please send two hard copies and at least one electronic copy to me at the address above (mail code: CED-2). If you have any questions, please contact me at 415-947-4178 or [vitulano.karen@epa.gov](mailto:vitulano.karen@epa.gov).

Sincerely,

A handwritten signature in black ink that reads "Karen Vitulano".

Karen Vitulano  
Environmental Review Office

cc: Leah Butler, EPA Region 9 Wetlands Office

### 2.3.3 Responses to Letter 3 Comments

- 3a Refer to the responses below on specific comments regarding issues identified.
- 3b Chapter 1 of this Final EIS/EIR describes the preferred alternative, which is a hybrid of the no berm and low berm options of Alternative 4 presented in the Draft EIS/EIR. Also, Table 1-2 (Chapter 1) compares the impacts of the preferred alternative with the two options of Alternative 4, based on the analyses in the Draft EIS/EIR.
- 3c An estimate of emissions for the preferred alternative (Alternative 4 with a hybrid version of the traditional riprap) was calculated using California Emissions Estimator Model (CalEEMod) model. Full model runs for all alternatives were not performed because the emissions associated with the preferred alternative are representative of the two variations of Alternative 4 evaluated in the Draft EIS/EIR and are expected to be more than Alternative 2 because of the higher number of truck trips for hauling material, longer period of construction, and more proposed activities. Although construction-related emissions associated with Alternative 3 would be lower than the preferred alternative, overall emissions for this alternative are anticipated to be slightly higher than the preferred alternative due to the increased truck emissions attributed to the higher levels of imported materials. The results of the modeling for the preferred alternative are presented in Chapter 1 of this Final EIS/EIR, and a comparison of the emissions for each alternative evaluated in the Draft EIS/EIR is provided in Chapter 3 of this Final EIS/EIR. The full air quality report is included as Appendix B. A table has been inserted into Section 3.8 (Transportation and Traffic) to compare truck trips between the alternatives; see Chapter 3 of this Final EIS/EIR for the revision.
- 3d Mitigation Measure AQ-1 has been revised to incorporate the recommended exhaust reduction measures. See Chapter 3 of this Final EIS/EIR.
- 3e The use of natural vegetation to help stabilize the bank has been incorporated into the preferred alternative design and was a component of Alternatives 3 and 4 (traditional riprap with low berm). The low berm provides an opportunity to plant riparian and wetland vegetation along the riprap and will provide a form of natural stabilization to reinforce the bank protection. See Chapter 1 for a description of the preferred alternative.
- 3f Additional information on wetlands impacts is presented in Chapter 3 of this Final EIS/EIR.
- 3g The Integrated Pest Management (IPM) Plan for the Sacramento NWR Complex covers the Sacramento River NWR and is available online at <http://www.fws.gov/sacramentovalleyrefuges/CCP.html> (under Sacramento, Delevan, Colusa, and Sutter NWRs CCP, “Final Appendices” file, Appendix F). Chapter 2 of Appendix F (the IPM Plan) addresses invasive species control and vegetation management. Herbicide use and other weed removal methods at the Riparian Sanctuary will comply with this plan. In addition, all pesticide use on the Sacramento River NWR requires a rigorous Pesticide Use Proposal (PUP) process review conducted by the Regional IPM coordinator. PUPs evaluate the following

environmental considerations prior to authorized use on NWR lands: 1) treatment need; 2) target pests; 3) management thresholds preventing Service habitat objective; 4) current IPM in place and best management practices; 5) ingredients/label/MSDS/toxicity rating; 6) how mixed and applied; 6) re-entry restrictions; 7) proposed number of applications and time of year; 8) where it will be applied (county); 9) soil types and distance to water; 10) NEPA and Endangered Species Act compliance.

Milestone is registered under the U.S. Environmental Protection Agency's Reduced Risk Pesticide Initiative for the following reasons: low use rate; very low toxicity to wildlife; breakdown into natural soil components; reduced runoff potential due to low rates; nonvolatile which protects non-target plants; lower worker exposure with favorable toxicity profile; no grazing restrictions, less persistence in the environment; and not a federally listed restricted use pesticide. According to the manufacturer's recommendations to promote herbicide (aminopyralid) decomposition, "plant residues should be evenly incorporated in the surface soil or burned. Breakdown of aminopyralid in plant residues or manure is more rapid under warm, moist soil conditions and may be enhanced by supplemental irrigation." The restoration plan identifies weed plant height limits for treatment of 12 inches. Therefore, minimal amounts of residual treated plant material will be left in the field. The minimal treated plant material will either be mowed or disked evenly into the soil.

A pest control advisor will be retained for developing IPM options during restoration activities. Recommendations will be developed during site visits with the pest control advisor, Refuge Manager, and restoration contractor during key time periods of the growing season (usually between February and June). During the site visits, the type of weed species and phenology, soil conditions, and predicted weather will be considered by the Refuge Manager and the restoration contractor to finalize the most efficient and environmentally friendly strategy for weed control.

No herbicide applications will occur on surface waters of the United States as part of the Riparian Sanctuary project.

Mitigation Measure WR-3 (now WR-2) has been revised to reflect mechanical treatment only within 100 feet of the Sacramento River; see Chapter 3 of this Final EIS/EIR for the revisions.

- 3h The Service initiated consultation with the State Historic Preservation Officer pursuant to Section 106 of the National Historic Preservation Act on August 27, 2012. The EIS/EIR provides conclusions of adverse effects to support the consultation, and the impact analysis conclusions in Section 3.8 (Cultural Resources) of the Draft EIS/EIR have been revised to reflect Section 106 language in Chapter 3 of this Final EIS/EIR.

Consultation letters were sent to the Chico, Colusa, and Cortina Rancherias and follow-up phone calls were made by the Service in July and August of 2011 to verify the letters were received. Then California State University, Chico, archaeological professor Greg White, who is recognized as a Native American expert in the area, served as the Service liaison with the tribes likely to have inhabited the cultural resources site in the project area. Mr. White, in coordination with the

local tribes, assisted the Service with meeting provisions of Native American Graves Protection and Repatriation Act, which requires consultation with Native American Most Likely Descendants regarding the disposition of human remains and management of historic properties containing human remains. According to White, the Sanctuary Mound is clearly such a property and is documented to contain human remains based on surveys, and it resides on the frontier between Maidu and Patwin lands currently coordinated by the Cortina and Mechoopda groups. Thus, the groups involved in this consultation are the groups specified by procedures of the Act.

The exact location of the cultural resources discussed in the Draft EIS/EIR cannot be identified, nor can additional details on the resources found within the site (confidential to reduce chance of illegal access). The Service will consider the need to register the site in the future, but understands that indicating its eligibility is sufficient for the current environmental review process. As discussed under Impact CR-1 (Construction and implementation of the Riparian Sanctuary project could affect the integrity of site CA-BUT-2658) in the Draft EIS/EIR, restoration activities have potential to disturb the cultural resources site, including buried resources and human remains, but Mitigation Measures CR-1a and CR-1b were identified to avoid activities that could affect the integrity of the site and disturb human remains.

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**DEPARTMENT OF WATER RESOURCES**

DIVISION OF FLOOD MANAGEMENT  
P.O. BOX 219000  
SACRAMENTO, CA 95821-9000



June 25, 2012

Daniel W. Frisk, Project Leader  
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U.S. Fish and Wildlife Service  
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Tracy McReynolds  
California Department of Fish and Game  
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Transmitted via e-mail to: dan\_frisk@fws.gov and tmcreynolds@dfg.ca.gov

**Comments on Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project DEIS/DEIR**

Thank you for the opportunity to comment on the proposed project DEIS/DEIR. Attached are comments that we would like you to consider in your preparation of the final EIS/EIR. If you have any questions, please contact me at nlerner@water.ca.gov or (916) 574-0384.

Sincerely,

A handwritten signature in black ink that reads "Noel Lerner".

Noel Lerner  
Chief, Flood Maintenance Office

# Department of Water Resources

## Division of Flood Management

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### Comments on Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project DEIS/DEIR and the associated hydraulic modeling report

*June 25, 2012*

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#### **Overview of Proposed Project and DEIS/DEIR**

This document contains comments on the Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project (Project) Environmental Impact Statement and Environmental Impact Report (DEIS/DEIR) and the accompanying hydrology and hydraulic model analysis report. The comments are provided based on a review by the Department of Water Resources (DWR), Division of Flood Management (DFM) staff. The review was primarily focused on the DEIS/DEIR and potential effects on hydraulics, including flood risk; effects on operations and maintenance; effects on other resources, primarily sensitive biological resources; and effects that might impair DFM and other entities in achieving flood protection goals consistent with the DWR Mission. There are a number of policies which pertain to flood management.

The proposed action (proposed project) evaluated in the Draft EIS/EIR consists of a combination of measures to restore riparian habitat at the Llano Seco Riparian Sanctuary Unit (Riparian Sanctuary) of the Sacramento River National Wildlife Refuge (Sacramento River NWR) and to protect the alignment of the Sacramento River at the water diversion for the Princeton-Codora-Glenn and Provident Irrigation District's (PCGID-PID) pumping plant and fish screen facility at River Mile (RM) 178. Habitat restoration is needed because the Riparian Sanctuary is currently dominated by nonnative plants and provides poor habitat value for wildlife and bank protection measures are needed to protect the water diversion for the PCGID-PID pumping plant and fish screen facility over the long term. The restoration plan includes removing nonnative and invasive plants, cleaning up flood debris, and planting native species at varying frequencies and densities. The proposed bank protection measures include installation of traditional riprap without a low berm to protect the eroding bank opposite of the pump intakes and removal of existing revetment (24,500 cubic yards) along the Sacramento River upstream of the facility and the Riparian Sanctuary such that a cutoff channel will develop. The project further proposes construction of a 20 foot wide access road from State Route 45 to the existing revetment.

## General Comments

- 1) Section 1.5.1, page 1-8 states: “Long-term maintenance of the project components will be the responsibility of PCGID-PID (bank protection measures), the Service (restoration plan), and possibly one or more state or federal agencies, if additional support is needed for larger maintenance efforts for the bank protection measures.”
  - a) Project proponents must take responsibility for impacts related to operations and maintenance that are a result of the project, including compensation for sediment accretion that must be removed, erosion repairs, and/or planting habitat to replace habitat losses during flood fighting in areas that have habitat as a result of the project. 4a
  - b) Section 3.6.3 Impacts & Mitigation Measures, Impact VW-6: The report specifies that operation and maintenance (O&M) activities are to be performed outside of the peak nesting/breeding season (August to March) for bank swallows. A provision should be included to allow for emergency in season O&M activities, if necessary. 4b
- 2) Any credits to be received as a result of removing existing bank revetment should be credited to the Sacramento River Bank Protection Program. 4c
- 3) Section 2.2.1, page 2-4 indicates that O&M responsibility for the revetments was transferred to the State (DWR) by the US Army Corps of Engineers (Corps) in 1986. While this responsibility was transferred to the State, it would not have been transferred directly to DWR, but the Reclamation Board (now Central Valley Flood Protection Board, or “Board”) who would, in turn, arrange for O&M either through a local agency or DWR. 4d
- 4) Section 2.2.4, page 2-17 states that, “Removal of the upstream revetment would require authorization from the Corps and DWR (Central Valley Flood Protection Board)”. Please be aware, the Board is a separate entity from DWR and any authorizations would need to be from the Board and not DWR. 4e

## Hydraulic Modeling

The hydraulic modeling done for this project is not discussed in great detail in the DEIS/DEIR. A summary report is included in Appendix B, “*2-DIMENSIONAL HYDRAULIC MODELING FOR PUMPING PLANT PROTECTION AND RIPARIAN RESTORATION AT THE LLANO SECO UNIT ON THE SACRAMENTO RIVER NEAR RM 178 – SUPPLEMENTAL DESIGN REPORT GLENN AND BUTTE COUNTY, CALIFORNIA*” [model], June 3, 2010, prepared by Ayres Associates. This report provides a general overview of the hydraulic modeling but does not provide detailed information about the model. This report in turn refers to the 2005 evaluation done by Ayres and states that the 2010 report is a supplement to the 2005 report. The Report indicates that the original 2-D model was developed by Ayres for the Corps in 1995 and that model was the basis for the modeling done for the Llano Seco project. The original

2-D model was developed in 1995 for RM 174 to 194. That version of the model was calibrated against the 1995 flood event. The model was updated in 2005 for the initial Llano Seco evaluation. Updates included refinement of the 2-D model mesh, changes in land use, inclusion of bank armoring, and the river alignment modified based on aerial photographs. The 2005 report does not include any information about model calibration and it is uncertain if any calibrations were done for that version of the model. The model was again refined and updated in the 2008 time frame with updated land use data as of 2008, bathymetry and topography data developed for this project, new bank protection installed by the Corps in 2008, and several assumed Manning’s “n” values that were changed from the previous model version. This model version covers the river reach from RM 173 to 183. The only mention of model calibration in the report refers back to the calibration of the original model to the 1995 storm and there is no documentation if this version of the model was calibrated.

**Comments**

- 5) Modifications made to the original Corps’ model in 2005 and 2010 for this project appears reasonable; however there is no documentation that the revised model has been calibrated or verified. Please provide any calibration and verification data available for the final version of the model. 4f
  
- 6) The two scenarios modeled for the 1957 Design Flow were for the Existing Land Use and the Proposed Post Project condition which includes traditional riprap with the low berm option at the point on the left bank of the river, across from the pumping plant (the traditional riprap option without the low berm is not modeled). The only modeling of the ultimate project objective (formation of the cutoff channel) was done in 2005 prior to development of the latest version of the hydraulic model. The cutoff channel should be modeled using the latest version of the model so results are directly comparable to the existing conditions model. In addition, although not modeled in the 2010 report, the expected cutoff channel formation may result in higher velocities through the project reach and at the pumping plant and downstream, and also higher peak flows at the pumping plant and downstream in the Sacramento River. Impacts from these potential downstream changes should be evaluated. 4g
  
- 7) Appendix B also includes the, “Llano Seco Riparian Sanctuary Channel Study: Meander Bend Migration and Cutoff Modeling Technical Report”, March 14, 2010 prepared by Eric W. Larsen. This report indicates the Meander Model was significantly changed and updated in the 2007 time frame, well after any hydraulic modeling was done of the cutoff channel. A hydraulic model of the cutoff channel should be developed based on information developed from the Meander Model. In addition, the meander modeling indicates that the river migration could take as long as 50 years to reach the desired alignment. To evaluate likely effects of this project over this period, it may be necessary to conduct hydraulic and hydrologic model runs for a sufficient number of anticipated intermediate alignments over this period (the Meander Model shows five year increments) to determine potential adverse impacts for the purposes of the EIS/EIR. 4h

8) Sections 5.1, 5.2, page 11 of the Hydraulic Modeling Report indicates the results of the modeling of existing conditions and post project conditions show that the combined project features have a minimal effect on the flood control capacity of the Sacramento River; however, anticipated increases in water surface elevations of approximately 0.2 feet during flood events may increase flood water quantities diverted into the Butte Basin upstream by approximately 1% (2,260 cfs). An assessment should be made of potential adverse effects to neighboring landowners and operations from a 1% increase of river flow into the Butte Basin, in terms of constraints to traffic, emergency access routes, farm operations, and other land uses. These additional inflows into Butte Sink will likely end up in the Sutter Bypass. While these flow changes may be proportionately small, some discussion should also be included about potential impacts to existing levee freeboard requirements and whether any impacts are expected in the Sutter Bypass.

4i

9) Figure 4 of the Modeling Report shows computed Water Surface Elevations and the Design Water Surface profile. While the latest version of the hydraulic model covers the reach between RM 173 and RM 183, Figure 4 ends at RM 175. Please show the entire modeled reach so that the computed profile will be visible for RM 173 to RM 175. At RM 175 the modeled flow elevations and design elevations appear to converge, and the downstream conditions and any potential impacts are not depicted or discussed. In addition, Figure 4 shows the 1957 Water Surface Design Profile and the modeled water surface elevations. It appears from the discussion of model modifications that the current channel alignment has been modified since the original 1957 Design Profile was developed. Have elevations and stations from the original Design Profile been modified to correspond to the modified alignment?

4j

## Geomorphology

Section 3.3.3 Impacts & Mitigation Measures (Fluvial Geomorphology and Soils), Impact GS-2: Modeling predicts that a channel will likely be created within five years following the revetment removal and would eventually cut off the existing meander. The eventual formation of the cutoff channel is predicted to move an estimated 311 cubic yards of sediment during its formation. This section of the report further states that it is “unclear how the mobilization of sediment and formation of the oxbow lake will affect channel alignment or floodwater conveyance in the project area.”

Section 3.4.3 Impacts & Mitigation Measures (Water Resources), Impact WR-4: The report states that, “the removal of the upstream revetment would expose *in-situ* riverbank and floodplain deposits on the peninsula to unimpeded flowing water along the Sacramento River. As river stage levels increase throughout the wet season, newly exposed (by removal of riprap) areas on the peninsula would erode simply due to contact with flowing water, which would mobilize sediment and further increase downstream turbidity levels. Modeling conducted by Larsen (2010) indicated that a cut-off channel could form within 5 years after removal of the revetment, and sediment modeling conducted by Ayres Associates (2011) indicated that approximately 311 acre-feet of

sediment would be eroded during the formation of the cut-off channel. However, the bend cut off would not occur instantaneously, and significant flow would still be expected in the bend as the cut off progresses downstream. As a result, a large portion of the material eroded in the formation of the cut-off channel would actually be deposited in the bend until the cut-off channel becomes hydrologically connected to the downstream end of the peninsula (Ayres Associates 2011).

**Comments**

10) The volume of sediment predicted to be mobilized (311 cubic yards) in Section 3.3.3 of the EIS/EIR conflicts with the volume of 311 acre-feet stated in the Sediment Transport Analysis (Ayres, 9/8/11) included in Appendix B and in Section 3.4.3. Further clarification regarding the anticipated volume of sediment to be mobilized by the formation of the cutoff channel and the fate of this sediment is necessary.

4k

11) Section 3.3.3 Environmental Consequences (Geology, etc.), Page 3-26, Geology Impact GS-2, Alternative 4, third paragraph states that the combination of cut-off channel and bank protection measures on the opposite bank to the pumping plant would be a benefit to the PCGID/PID facility, and impacts to function of the Sacramento River in the project area are less than significant. This paragraph should be changed to state that the project features would likely benefit the PCGID/PID facility. However, given the uncertainty of the localized erosion and deposition in the river in the vicinity of an active eroding cut-off channel, impacts to existing channel morphology and function of the Sacramento River in and adjacent to the project area may be significant.

4l

12) Ayres September 8, 2011 Sediment Transport Analysis, third page: In the event of the development of a channel cutoff, the study concludes that there would be minimal deposition in the river downstream of the cutoff. This general statement may be likely; however, the cutoff channel could set into motion an increased rate of river channel dynamism in the vicinity of the cutoff channel until new channel equilibrium is reached. The channel location may therefore be transient, dynamic, and temporary, and difficult to predict over several years. Allowing for a cutoff channel to develop is unprecedented and not without risks.

4m

### 2.3.4 Responses to Letter 4 Comments

- 4a The Service will have responsibility for operations and maintenance of the restoration area at the Riparian Sanctuary, and PCGID-PID will have responsibility for operations and maintenance of the revetment. PCGID-PID may coordinate with other agencies for certain activities if additional support is needed. The Service will maintain an access road across the northern portion of the Riparian Sanctuary for long-term maintenance. No changes to the Draft EIS/EIR are necessary.
- 4b It is assumed that California Department of Water Resources (DWR) will follow its agency processes for conducting emergency actions, if they are determined to be necessary in the project area for flood control or other purposes for which DWR is responsible. Emergency actions are not included in the Riparian Sanctuary project and would be subject to a separate approval in accordance with the standards and guidelines of the agency responsible for the emergency action. No changes to the Draft EIS/EIR are necessary.
- 4c The Service (Jennifer Hobbs) contacted Noel Lerner at DWR Division of Flood Management on June 29, 2012 to clarify the comment regarding “credits” for removing rock. Mr. Lerner clarified that the comment was actually referring to any additional rock removal credit remaining after the project effects are mitigated for, which could be applied to the Sacramento River Bank Protection Program. The amount of rock that would be removed as part of the Riparian Sanctuary project is needed as “credit” for the proposed revetment on the Riparian Sanctuary Unit. The agencies acknowledge DWR’s staff contribution to the project in terms of coordination and involvement in the Technical Advisory Committee and support future rock removal projects that could be credited towards the Sacramento River Bank Protection Program. No changes to the Draft EIS/EIR are necessary.
- 4d The discussion of operations and maintenance responsibility for the existing revetment has been revised in Chapter 3 of this Final EIS/EIR.
- 4e The statement regarding authorizations has been revised in Chapter 3 of this Final EIS/EIR.
- 4f The original Corps’ model was developed by Ayres Associates and was calibrated. For the proposed project, the model was modified to update channel topography and land use. Significant effort was expended to use the most current topographic and land use information. The Manning n values used in the updated models are consistent with previous models. After making the modifications to the earlier models, the results remained consistent with the earlier models. The existing conditions model was then used as a basis of comparison for the alternatives modeling. Therefore, the modeling for the project is an adequate representation of existing and proposed conditions at the project area. Although high water marks were collected in 2006, the flows in 2006 do not correspond to any modeled flows and could not be used for verification purposes. No changes to the Draft EIS/EIR are necessary.
- 4g The 2005 modeling was performed for a range of channel and overbank conditions including natural changes, changes in land use, and design alternatives. The hydraulic results were

consistent among the runs with flow splits generally ranging plus or minus 2 to 3 percent from the original 1957 design conditions. The updated modeling was performed primarily to support final design of the riprap bank protection with the most recent information, not to repeat the 2005 modeling. Remodeling the cut-off channel is not considered necessary because this condition results in channel flow that not only bypasses the new bank revetment but also is aligned along the pumping plant rather than impinging on the bank near the pumping plant. This result is also expected with any updated modeling.

Impact WR-5 was revised in Chapter 3 of this Final EIS/EIR to present additional details on the anticipated changes in flow velocities along the Sacramento River, based on the 2005 and 2010 modeling conducted for the project and alternatives.

- 4h Although the bend migration and cut-off modeling was updated to further assist in project design, Ayres Associates believes that the cut-off channel as modeled in the 2005 hydraulic analysis is a reasonable and expected alignment based on the topography of the bankline and bend area, and it is the most likely cut-off condition. The 2010 modeling conducted by Larsen was updated and calibrated to look at variable flow rates and the heterogeneous erodibility surfaces. The model was then updated and calibrated using the channel alignments and flow regimes between 1976 and 2007. Once it was calibrated, the model looked at three different scenarios, as well as 50-year projections. The results of the original and revised cut-off modeling (Larsen 2010, Figure 11 upstream constraint removed and downstream constraint extended) are similar in the cut-off area and do not show any significant changes in channel meander. Ayres Associates also feels that the range of possible cut-off alignments would not create significantly different hydraulic conditions in the project area and does not warrant the extensive additional modeling that would be required. No changes to the Draft EIS/EIR are necessary.
- 4i Based on the 2005 modeling, the range of flow splits varied by plus or minus 2 to 3 percent. Some of the conditions that were modeled were purely natural and others were changes in land use or channel alignment, and all produced similar split flow variations. All of the modeled conditions resulted in water surface elevations well below the 1957 design profile. As the channel and overbank areas continue to change, other small but similar changes in the flow split would be expected. The amount of change depicted in the various model runs has limited effect on the flow split and water surface. Should a 2 percent change (+/-) in flow split occur, water surface changes in the bypass areas are expected to change by 0.02 to 0.04 feet, though based on the range of conditions modeled, this change could be an increase or decrease in water surface elevation. With the predicted water surface changes in the bypass areas being insignificant, no adverse impacts are anticipated to neighboring landowners and operations, such as traffic constraints, emergency access routes, farm operations, or other land uses; and no impacts to the Sutter Bypass are anticipated. No changes to the Draft EIS/EIR are necessary.
- 4j The model results downstream of RM 175, when compared to the design water surface elevation, are not relevant because the model that was used set the water surface at the design elevation at RM 173. The results between RM 173 and RM 175 are dominated by the condition set at RM 173. Although the channel alignment changes, the River Mile locations are maintained for

- consistency in the comparisons. The 1957 design water surface is a 1-D profile and the model is two dimensional, so the profile is taken from the model at representative locations with the design profile held constant. The full water surface profile plot down to RM 173 shows that the proposed condition is below the 1957 design profile along the entirety of the model. Figure 4, Water Surface Profile Comparisons, from the Ayres 2-Dimensional Hydraulic Modeling Report (Draft EIS/EIR Appendix B – Bank Protection Measure Reports) has been updated to include RM 173. This revised figure is provided in Chapter 3 of this Final EIS/EIR.
- 4k The units was a typo and has been corrected in Chapter 3 of this Final EIS/EIR. The estimated volume of 311 acre-feet (500,000 cubic yards) in the Sediment Transport Analysis is based on the difference in volume between the cut-off channel and the existing ground. The abandoned channel is approximately 6,000 feet long and 450 feet wide, or 62 acres. Therefore, 5 feet of aggradation in the abandoned channel will balance the erosion of the cut-off channel. The cut-off channel will not occur instantaneously so river flow will continue around the abandoned channel, which will allow sediment accumulation to occur.
- 4l The conclusion of “less than significant” for Alternative 4 under Impact GS-2 in the Draft EIS/EIR is supported by the analysis discussion and modeling. The Sacramento River alignment would be modified with removal of the rock, but this change would not constitute a significant impact using the thresholds identified in the section. Specifically, substantial erosion, siltation, and flooding are not expected as a result of the peninsula cut off and changes to the river alignment. The rock removal would accelerate natural processes and allow the river system to naturally modify its alignment, which would be expected to occur over a longer period without active maintenance of the upstream rock and with one or more major flood events, as evidenced by existing scour holes behind the existing rock. The natural changes to the river alignment may be substantially different compared with current conditions, but they would be the result of natural processes, with the rock removal simply encouraging the natural processes. The 2005 modeling and Larsen’s analyses (2004 and 2010) indicate that the cut-off channel will not impact the function of the Sacramento River, and the changes are within the range of natural changes in this reach of the river. No changes to the Draft EIS/EIR are necessary.
- 4m Comment acknowledged. The modeling predicts future changes to the Sacramento River alignment based on certain assumptions, and it is understood that these changes are difficult to predict. The channel is expected to be transient and dynamic until an equilibrium is reached. No changes to the Draft EIS/EIR are necessary.

The sediment transport analysis was performed specifically to address the concerns expressed by DWR engineer Sungho Lee. His primary concern was deposition in the overbank area, reducing flood conveyance of the system. The concern was addressed using the sediment transport analysis as described in the Sept. 8, 2011 memo. He only expressed minor concern about sediment deposition downstream of the project area. To address downstream deposition potential, a rough estimate of the amount of erosion that could occur in the creation of the cut-off channel was compared to the amount of aggradation that would be required in the abandoned channel. The 311 acre-feet divided by 62 acres is only 5 feet of deposition required to balance

that erosion. Considering the likelihood of this relatively small amount of deposition in the abandoned channel, this level of analysis was considered satisfactory.

To address additional concerns of the DWR Flood Maintenance Office other comparisons have been made. One comparison is of the reasonableness of 5 feet of deposition in the abandoned channel. In a study of deposition rates in Sacramento River abandoned channels (performed by Kondolf et al. and presented at the Sacramento River Restoration Science Conference 2007), average rates of deposition in abandoned channels in the first 10 years are 10 cm/yr and 4 cm/yr for the first 50 years after bend cut off. These rates are equivalent to 3.3 feet in 10 years and 6.6 feet in 50 years. Therefore, much of the erosion produced by the cut off will likely be balanced by deposition in the abandoned channel.

Another consideration is the volume of material eroded from the channel bank that is proposed for protection (RM 178 L). Based on bank erosion that occurred between 1988 and 2008, approximately 475,000 cubic yards of sediment would not have eroded had the bank been protected. Based on estimates of future channel migration (Larsen 2010, Figure 6), leaving this bank unprotected could result in 1,040,000 cubic-yards of erosion in 50 years.

Based on these comparisons, the channel cut off combined with expected deposition in the abandoned channel and avoided erosion of the downstream bank, a net reduction in downstream sediment supply is expected. Also given the number of sources of sediment along this reach of the Sacramento River, the amount of erosion in the cut-off channel is within natural amounts and is not unprecedented.

5-30  
meeting

# Riparian Sanctuary Draft EIS/EIR

## Sign In Sheet

<u>Name</u>	<u>Affiliation</u>	<u>Contact</u>
April Senio	Old Bend Resident	april@pubbarco.com
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OSCAR WILLIAMS	O&J FARMS	
cow Kennedy	Kennedy RANCH	
Jane Dolan		
Les Heringer	M+T Ranch	



## Chapter 3 Changes to Draft EIS/EIR

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This chapter identifies changes to the Draft EIS/EIR in response to the comments received and based on the responses documented in Chapter 2 of this Final EIS/EIR. Insertions are shown in underline format, and deletions are shown in ~~strike through~~ format. None of the changes constitutes new significant information or results in new significant impacts or mitigation measures.

### 3.1 Changes to Chapter 2 Description of Alternatives

*Page 2-4, paragraph 1:*

Operation and maintenance responsibility of the revetment at RM 178.5 on the left bank and at RM 179.4 on the right bank was transferred to the State (~~California Department of Water Resources (DWR) Reclamation Board, now Central Valley Flood Protection Board~~) from the U.S. Army Corps of Engineers (Corps) in 1986 under an agreement that requires the State to maintain the revetment in perpetuity. These revetment projects are subject to the Supplement to Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project, Unit No. 140 (U.S. Army Corps of Engineers 1960). The manual states that repairs for serious damage of the revetment in the event of a flood or other cause will be based on the actions recommended by the State, and maintenance would be arranged through either a local agency or the California Department of Water Resources (DWR).

*Page 2-17, paragraph 4, first sentence:*

Removal of the upstream revetment would require authorization from the Corps and ~~DWR~~State (Central Valley Flood Protection Board).

### 3.2 Changes to Section 3.3 Geology, Fluvial Geomorphology, and Soils

*Page 3-26, paragraph 2 under Alternative 4, second sentence:*

The formation of a cut-off channel would mobilize an estimated 311 ~~cubic yards~~acre-feet of sediment during its formation and likely cause the existing river channel to become abandoned during low flows, forming an oxbow lake (Ayres Associates 2011).

### 3.3 Changes to Section 3.4 Water Resources

*Page 3-42, Mitigation Measure WR-2 (Sample streambed sediments and properly dispose of mercury-rich sediment):*

Mitigation Measure WR-2 is deleted and no longer required for the Riparian Sanctuary project based on subsequent soil sampling and an environmental site assessment. Mitigation Measure WR-3 is now Mitigation Measure WR-2.

*Page 3-44, Mitigation Measure WR-3, now WR-2 (Implement measures during construction and restoration activities to prevent accidental discharge of potentially hazardous materials), 3<sup>rd</sup> and 5<sup>th</sup> bullets under Herbicide Application Measures:*

- The application of herbicides will strictly adhere to the manufacture's instructions, the Service's Pesticide Use Proposal process, and the Sacramento River NWR Complex Integrated Pest Management Plan (Appendix F to U.S. Fish and Wildlife Service 2005, 2009).
- All herbicides will be mixed and used according to their labeled specifications, and the mixing or storage of herbicides will take place more than 100 feet from the Sacramento River. Basal and foliar application of herbicides will also be prohibited within 100 feet of the Sacramento River. Removal of weeds within 100 feet of the Sacramento River will be restricted to mechanical methods, including disking, floating, mowing, and chopping prior to seed set.

*Page 3-48, Impact WR-5 (Implementation of the Riparian Sanctuary project could modify flood flows through the project area as a result of the change in the Sacramento River channel and restoration activities and expose people, property, or structures to flood risks.), last paragraph:*

Modeling results from Larsen (2010) indicate that removal of the upstream revetment on the upstream peninsula would likely facilitate the formation of a channel that would cut through the bend (cut-off channel) within the first 5 years. If a cut-off channel forms, it would help the channel maintain a favorable alignment with the PCGID-PID pumping plant and fish screen facility (Mussetter Engineering, Inc. 2004) in combination with the traditional riprap. The cut-off channel is also predicted to eventually hydrologically disconnect the upstream bend of the peninsula from the main channel, which would cause the existing channel on the east side to become an oxbow lake during lower flow regimes. According to modeling conducted by Ayres Associates (2005), the cut-off channel would increase flow velocities across the peninsula by up to 5 feet per second and in front of the pumping plant by up to 4 feet per second. Flow velocities around the peninsula would decrease by up to 5 feet per second as the new cut-off channel forms. Near the southern end of the proposed bank protection, flow velocities would increase up to 2 feet per second; the flows would be consistent with current flow conditions near the southern end of the Riparian Sanctuary. It is unclear to what extent the abandonment of the existing channel would have on flood water conveyance and flood hazards downstream at the Riparian Sanctuary, but it is likely that higher flood flows would continue to flow across the Riparian Sanctuary floodplain. Therefore, impacts associated with flooding would be the same as those described for Alternatives 2 and 3 and would be less than significant.

### 3.4 Changes to Section 3.6 Vegetation, Wildlife, and Sensitive Biological Resources

Page 3-107, Impact VW-2 (Construction of the Riparian Sanctuary project could result in placement of fill material into waters of the United States and disturbance of wetlands), Alternative 2 impact discussion; the following table is inserted after paragraph 2:

**Table 3.6-3. Estimated Impacts to Waters of the United States and Wetlands**

Wetland/Water of the U.S.	Alternative 2 Impacts	Alternative 3 Impacts		Alternative 4 Impacts	
		No Berm	Low Berm	No Berm	Low Berm
Riparian wetland on gravel bar	1 acre	4.5 acres	4.5 acres	4.5 acres	4.5 acres
Riparian wetland on peninsula	None	None	None	2.7 acres	2.7 acres
Fresh emergent/riparian wetland	None	None	None	12 acres	12 acres
Sacramento River	12,160 tons of fill (quarry stone)	56,000 tons of fill (quarry stone)	69,150 tons of fill (quarry stone)	56,000 tons of fill (quarry stone)	69,150 tons of fill (quarry stone)

\*Note: Calculations are based on the anticipated area of disturbance for the project and reflect temporary as well as permanent impacts from revetment installation, rock removal (Alternative 4 only), and the cut-off channel (Alternative 4 only). Fill into the Sacramento River is the estimated amount of fill (quarry stone) required for the revetment and assumes all of the fill would be placed below the ordinary high water mark (conservative estimate).

Pages 3-109 and 3-110, Impact VW-2 (Construction of the Riparian Sanctuary project could result in placement of fill material into waters of the United States and disturbance of wetlands), Alternative 4 impact discussion, paragraph 2:

Removal of rock along the north riverbank of the peninsula would require the removal of potentially Corps jurisdictional riparian wetland growing in the existing revetment (up to about 4.54.5 acres), but would not result in a discharge of fill into the Sacramento River or impacts on fresh emergent wetlands. Removal of rock on the upstream peninsula would remove about 2.6 acres of riparian wetlands, which would likely regenerate following construction. Removal of rock would allow scour holes to expand, and the Sacramento River is predicted to eventually cut off the peninsula (Ayres Associates 2010). The predicted cut-off channel would remove approximately 1.1 acres of riparian wetland and 12 acres of fresh emergent/riparian wetland on the peninsula (Table 3.6-3); the exact amount may be higher or lower, depending on how the river actually cuts off. As described under Impact VW-1, this cut off is expected to result in the establishment of new riparian wetlands and fresh emergent wetlands on the abandoned oxbow. If the existing channel and adjacent floodplain on the east side of the peninsula becomes completely filled in and naturally restores riparian and wetland vegetation, up to 145 acres of riparian and wetland habitat could become established on the oxbow. The entire channel would not likely fill completely in, but a large amount of riparian habitat would become established on the oxbow. The acreage of riparian and fresh emergent wetlands would likely be a portion of the total, but would be expected to fully offset the loss of wetlands along the cut-off channel. Impacts on waters of the United States, including wetlands, as a result of the cut off would be the result of natural processes and would not

require additional Section 404 permitting. These impacts would be less than significant because no net loss of wetlands is expected.

### 3.5 Changes to Section 3.7 Cultural Resources

*Page 3-122, paragraph 1:*

This section discusses the prehistoric, ethnographic, and historic contexts of the region and describes cultural resources in the project area. It analyzes the effects of the alternatives on important cultural resources in the project area, including potential historical resources. This analysis was conducted in compliance with the requirements of CEQA, NEPA, and Section 106 of the National Historic Preservation Act (NHPA). Cultural resources include prehistoric and historic archaeological sites, historic buildings and structures, historic districts with multiple buildings or structures, districts of archaeological sites, cultural landscapes, traditional cultural properties, and resources of interest to Native American groups.

*Page 3-130, Significance Thresholds:*

Impacts to cultural resources would be considered significant under CEQA if the Riparian Sanctuary project would:

- cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines;
- cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5;
- disturb any human remains, including those interred outside of formal cemeteries;
- ~~reduce the integrity of known or unknown historic properties;~~ or
- conflict with the applicable goals, objectives, or strategies of the Sacramento River NWR relating to cultural resources.

Under federal regulations, a project has an effect on an historic property when the undertaking (i.e., federal action) could alter the characteristics of the property that may qualify the property for inclusion in the NRHP, including alteration of the location, setting, or use. An undertaking may be considered to have an adverse effect on an historic property when the effect may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

- cause physical destruction of or damage to all or part of a historic or prehistoric site;
- alter a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
- remove the property from its historic location;
- change the character of the property's use or any physical features within the property's setting that contribute to its historic significance;

- introduce visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; or
- neglect a property, which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an affiliated Native American tribe or Native Hawaiian organization.

*Pages 1-131 and 1-132, Impact CR-2 (Construction and implementation of the Riparian Sanctuary project could affect the integrity of site CA-BUT-2658), Alternatives 1 through 4 impact discussions:*

***Alternative 1 – No-Action Alternative***

Under the No-Action Alternative, no construction activities would take place. This alternative would not result in any construction-related impacts on site CA-BUT-2658. The site would continue to be avoided during periodic maintenance activities and agriculture-related activities on the Riparian Sanctuary, and the Riparian Sanctuary would not be open to the public to avoid potential impacts to the site. Under the NHPA, no historic properties would be affected.

***Alternative 2 – Spur Dikes and Site-Specific Plantings/Alternative 3 – Traditional Riprap and Site-Specific Plantings/Alternative 4 – Traditional Riprap with Upstream Rock Removal and Site-Specific Plantings***

Construction of the bank protection measures would not be expected to affect CA-BUT-2658 because the site is not in the areas proposed for disturbance during construction of the spur dikes, including staging and access areas. The additional rock removal on the upstream peninsula under Alternative 4 would also not affect site CA-BUT-2658. Under the NHPA, these activities would have no adverse effects on historic properties.

Restoration activities at the Riparian Sanctuary, including site preparation, plantings, installation of the irrigation system, monitoring activities, and herbicide application, could disturb site CA-BUT-2658 and result in a loss of integrity that could make the site ineligible for listing in the National Register or result in an adverse change in the significance of the resource that could make it ineligible for listing in the CRHR. Specifically during the construction phase, vegetation and debris removal during preparation for restoration, disking to smooth the ground surface for irrigation and tractor operations, and planting activities that involve digging to install plants would cause ground disturbance in the location of the site, which could destroy or damage artifacts and human remains that contribute to the site's integrity. Installation of the irrigation system could also disturb the site if any of the irrigation lines cross through the site. The presence of people performing the restoration activities introduces the possibility of casual or active artifact collection activities during construction, which could result in the loss of important components of the site and greatly reduce its integrity. Because of the potential loss of integrity of the site, construction-related impacts on site CA-BUT-2658 would be a significant impact under CEQA and an adverse effect under the NHPA.

*Page 3-132, paragraph 3, last two sentences, also under the Alternative 2, 3, and 4 Impact CR-1 discussion:*

These impacts would be significant under CEQA and would constitute an adverse effect under the NHPA. Implementation of Mitigation Measures CR-1a and CR-1b would reduce the potential for disturbances to the site and help protect its integrity and significance, which would ensure impacts are less than significant under CEQA and would result in no adverse effect under the NHPA.

*Page 3-133, Impact CR-2 (Construction activities could disturb or damage previously undiscovered historical or archaeological resources or human remains):*

#### ***Alternative 1 – No-Action Alternative***

Under the No-Action Alternative, no construction activities would take place. This alternative would not result in any construction-related impacts on previously undiscovered cultural resources. Under the NHPA, no historic properties would be affected.

#### ***Alternative 2 – Spur Dikes and Site-Specific Plantings/Alternative 3 – Traditional Riprap and Site-Specific Plantings/Alternative 4 – Traditional Riprap with Upstream Rock Removal and Site-Specific Plantings***

The project area and vicinity have an extensive cultural history, and many prehistoric and historic cultural resources have been documented at Llano Seco Rancho, along the Sacramento River, and in the project area. Based on the area's history and the extent of cultural resource discoveries, it is possible that previously undiscovered historical and archaeological resources, such as lithic scatters, prehistoric habitations, or historic resources, may be discovered in the project area during construction activities. Buried or previously undiscovered resources, including new features of previously recorded sites, could be encountered during ground-disturbing activities associated with the restoration activities. If resources are discovered, impacts on the resources could be significant under CEQA or constitute an adverse effect under the NHPA if they are determined eligible for listing in the National Register or CRHR and if the impact would affect their eligibility. The Service would implement treatment measures in accordance with the Sacramento River NWR CCP and Cultural Resources Overview and Management Plan to ensure consistency with these plans and minimize adverse impacts. In addition, implementation of Mitigation Measures CR-2a and CR-2b would further ensure that previously undiscovered cultural resources or human remains are not adversely affected by construction and restoration activities, resulting in a less-than-significant impact under CEQA and no adverse effect under the NHPA.

### **3.6 Changes to 3.8 Transportation and Traffic**

*Page 3-138, Impact TT-1 (Construction activities could increase traffic or affect circulation on nearby roads or highways), Alternative 2 impact discussion; the following table is inserted after paragraph 2:*

**Table 3.8-1. Estimated Haul Truck Trips for Each Alternative**

	Alternative 2	Alternative 3		Alternative 4*	
		No Berm	Low Berm	No Berm	Low Berm
Total Materials Needed	12,160 tons	46,000 tons	69,150 tons	21,500 tons	44,650 tons
Total Haul Trucks	600 trips	2,300 trips	3,460 trips	1,075 trips	2,235 trips
Daily Haul Trucks	25-30 trips	25-30 trips		25-30 trips	

Note: Estimate of haul trucks is for construction phase and bringing rock and other materials for revetment construction into the project area. Trucks are expected to come from within a 100-mile radius of the project area and would be capable of hauling approximately 20 tons of materials.

\*Alternative 4 estimates assume rock removed from the upstream peninsula can be used for the traditional riprap. If approval is not obtained, the estimates would be the same as Alternative 3.

### 3.7 Changes to Section 3.9 Air Quality

Page 3-141, *Federal Conformity Requirements*, has been revised as follows:

#### Federal Conformity Requirements

The purpose of EPA's General Conformity Rule is to ensure that federal projects conform to applicable SIPs so that they do not interfere with strategies employed to attain the NAAQS. The rule applies to federal projects in areas designated as nonattainment areas for any of the six criteria pollutants and in some areas designated as maintenance areas. The rule applies to all federal projects except the following:

- programs specifically included in a transportation plan or program that is found to conform under the federal Transportation Conformity Rule,
- projects with associated emissions below specified *de minimis* threshold levels (i.e., levels too small to be concerned with), and
- certain other projects that are exempt or presumed to conform.

If a project would result in total direct and indirect emissions in excess of the *de minimis* emission rates, the emissions must be demonstrated to conform to the applicable SIP for each affected pollutant. If emissions would not exceed the *de minimis* levels and are not regionally significant, then the project is presumed to conform and no further analysis or determination is required.

Air quality modeling was conducted to quantify emissions associated with the Riparian Sanctuary project, and a comparison of construction-generated emissions to *de minimis* levels is provided for each alternative in Section 3.9.3, Environmental Consequences. ~~is assumed to conform because it is not expected to result in annual emissions above the *de minimis* rates of pollutants for which Butte or Glenn County is in nonattainment status (described in Section 3.9.2, Affected Environment).~~

Page 3-146, *Methodology*, has been revised as follows:

## Methodology

The analysis of air quality impacts is based on a review of applicable management plans, air quality data for Butte and Glenn counties, and information on sources of pollutants and land uses in and near the project area and an evaluation of the Riparian Sanctuary project's potential to result in air emissions that could affect local or regional air quality. Short-term construction emissions associated with the preferred alternative were calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1. Emissions were quantified based on the estimated duration of construction activities, equipment use, and vehicle trips provided by River Partners and Ayres Associates. Emissions of ROG, NO<sub>x</sub>, and PM<sub>10</sub> were compared to the Butte County Air Quality Management District's (BCAQMD) recommended significance thresholds for determination of impact significance. For informational purposes, PM<sub>2.5</sub> emissions were also quantified. Construction-generated emissions were quantified for both summer and winter conditions. Impacts for the remaining alternatives were qualitatively analyzed by comparing proposed activities with the preferred alternative (variation of Alternative 4). Long-term impacts (routine maintenance and inspection trips) are discussed qualitatively and are considered in the context of the current attainment status for the region and potential for emissions generated by the project to exceed air quality standards. GHG emissions were quantified for each construction phase of the preferred alternative, with qualitative comparisons provided for the other alternatives.

*Page 3-146, Significance Thresholds, has been revised as follows:*

## Significance Thresholds

Air quality impacts would be considered significant if the Riparian Sanctuary project would:

- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations;
- create objectionable odors affecting a substantial number of people;
- generate GHG emissions, either directly or indirectly, that could have a substantial impact on the environment; or
- conflict with or obstruct implementation of an applicable air quality plan or plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Additionally, the evaluation of project-related air quality impacts was based on thresholds of significance developed by the BCAQMD, as identified in its *CEQA Air Quality Handbook, Guidelines for Assessing Air Quality Impacts for Projects Subject to CEQA Review* (January 2008) (Table 3.9-3). The Glenn County Air Pollution Control District has not yet adopted recommended thresholds of significance; therefore, the BCAMD thresholds of significance were used. Neither air district has adopted recommended significance thresholds for evaluation of GHG emissions.

**Table 3.9-3. Recommended Thresholds of Significance for Criteria Air Pollutants of Primary Concern**

<u>Pollutant</u>	<u>Level A</u>	<u>Level B</u>	<u>Level C</u>
<u>NO<sub>x</sub></u>	<u>≤ 25 lbs/day</u>	<u>&gt; 25 lbs/day</u>	<u>&gt; 137 lbs/day</u>
<u>ROG</u>	<u>≤ 25 lbs/day</u>	<u>&gt; 25 lbs/day</u>	<u>&gt; 137 lbs/day</u>
<u>PM<sub>10</sub></u>	<u>≤ 80 lbs/day</u>	<u>&gt; 80 lbs/day</u>	<u>&gt; 137 lbs/day</u>

**Notes:**

**Level A:** Any project which has the potential to emit up to the Level A thresholds would be considered to have a potential significant impact and should implement standard mitigation measures.

**Level B:** Projects which exceed Level B thresholds should select as many best available mitigation measures (BAMM), in addition to the recommended list of standard mitigation measures.

**Level C:** Projects which exceed the Level C thresholds would be considered to have a significant impact.

Source: Butte County Air Quality Management District 2008

*Pages 3-146 and 3-147, Impact AQ-1 (Construction activities could generate short-term vehicle or equipment emissions or air pollutants that could affect local or regional air quality), Alternatives 1 - 3 impact discussions:*

***Alternative 1 – No-Action Alternative***

Under the No-Action Alternative, no construction activities would take place. This alternative would not result in construction-generated emissions or construction-related air quality impacts.

***Alternative 2 – Spur Dikes and Site-Specific Plantings***

Construction of spur dikes and restoration of the Riparian Sanctuary under Alternative 2 would involve activities that generate dust (e.g., PM<sub>10</sub> and PM<sub>2.5</sub>), vehicle and equipment emissions (e.g., NO<sub>x</sub>, CO, CO<sub>2</sub>, reactive organic gases, SO<sub>2</sub>), and other air pollutants (e.g., other ozone precursors) that would contribute to existing violations of standards for ozone and particulate matter. Construction of the revetment and restoration activities would require the use of the following equipment: excavator(s), loader(s), a crane, dump trucks, crawler tractor(s), pickup trucks, water truck(s), generator(s), air compressor(s), winch(es), and chainsaws. About 25–30 trucks per day would be expected to access the project area during construction of the spur dikes, and less than 10 additional trips would be needed for restoration plantings. Truck traffic to haul materials and equipment and worker traffic would generate CO and other pollutants from exhaust that would contribute to ozone and GHG emissions in the region. Construction activities in the project area would also result in exhaust and other emissions, as well as fugitive dust from ground-disturbing activities and movement of rock and other materials for the spur dikes. Access on dirt roads on the Llano Seco Rancho could also generate dust, but compliance with agreements with the landowner would ensure dust is minimal, specifically by maintaining low vehicle speeds through the private property and watering the roads as needed. Odors from emissions generated during construction would not likely be noticeable to nearby sensitive receptors because of the distance between the project area and residences or recreational areas (typically more than 700 feet).

Dust and emissions in the project area could disperse to nearby residences and recreation areas, but few people would be affected. The air quality impacts would also be temporary and limited to the construction period, although construction traffic could contribute substantially to CO and ozone emissions in the region based on the estimated number of trips (see Section 3.8, Transportation and Traffic). Fugitive dust would be more localized and would have a less substantial effect on regional air quality.

GHG emissions would primarily be in the form of CO<sub>2</sub> from equipment and vehicle exhaust, with nominal increases in methane and nitrous oxide emissions. A net increase in CO<sub>2</sub> emissions would result from engine exhaust from heavy-duty construction equipment, transport trucks hauling materials, and worker commute trips during construction. Although any increase in GHG emissions would add to the quantity of emissions that contribute to global climate change, emissions associated with construction of the revetment and restoration activities would occur over a finite period of time and would cease upon completion of these activities. Because of the existing nonattainment status, however, the increase in particulate matter and ozone emissions, as well as potential GHG emissions, during construction would be considered significant. Based on the air quality modeling, emissions associated with Alternative 2 would not exceed the *de minimis* thresholds for NO<sub>x</sub> (100 tons per year), and a formal conformity determination is not required.

Implementation of Mitigation Measure AQ-1 would reduce the project's contribution to local and regional air quality impacts and minimize fugitive dust and emissions during construction, effectively reducing impacts to a less-than-significant level. The mitigation measure would also ensure the Riparian Sanctuary project is consistent with the Northern Sacramento Valley Area Air Quality Attainment Plan and BCAQMD thresholds for pollutants (25 pounds per day for NO<sub>x</sub> and reactive organic gases, 80 pounds per day for PM<sub>10</sub>).

### *Alternative 3 – Traditional Riprap and Site-Specific Plantings*

Construction of traditional riprap and restoration of the Riparian Sanctuary under Alternative 3 would involve similar activities as Alternative 2 and would result in the same types of air quality impacts. This alternative requires the importation of more construction materials than the other alternatives; therefore, construction-generated emissions would likely be the highest of all the alternatives. Dust impacts would be primarily localized, but exhaust-related emissions would be more regional and would affect air quality in a larger area because of the need to haul materials and rock from sources up to 100 miles away. Few sensitive receptors would be affected by emissions and dust. Construction-related impacts on air quality would be temporary, but would contribute to the existing violations of fugitive dust and ozone in the area, as well as contributing to GHG emissions, resulting in a significant impact. Implementation of Mitigation Measure AQ-1, described for Alternative 2, would reduce air quality impacts during construction to a less-than-significant level. Based on the air quality modeling, emissions associated with Alternative 3 would not exceed the *de minimis* thresholds for NO<sub>x</sub> (100 tons per year), and a formal conformity determination is not required.

*Page 3-148, Mitigation Measure AQ-1 (Implement a fugitive dust and emissions reduction plan), last bullet:*

- Contractors will commit to using the best available emissions control technology. The use of diesel construction equipment meeting ARB’s 1996 or newer certification standard for off-road heavy-duty diesel engines and having Tier 4 engines will be maximized to the extent feasible. Equipment may be electrified if feasible, and gasoline-powered equipment should be substituted for diesel-powered equipment where feasible, unless alternatively fueled construction equipment can be used. If the use of all equipment with Tier 4 engine standards is not feasible, the contractor should commit to using ARB and EPA-verified particulate traps, oxidation catalysts, and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants during construction.
- Onroad heavy-duty haul trucks shall be model year 2000, or newer, or shall meet equivalent model year emissions standards.
- All construction equipment shall be electrified, when feasible, and gasoline-powered equipment shall be substituted for diesel-powered equipment, where feasible, unless alternatively fueled construction equipment can be used.
- A construction traffic and parking management plan will be developed and implemented to maintain traffic flow and minimize vehicle trips.

Additional measures to reduce GHG emissions include:

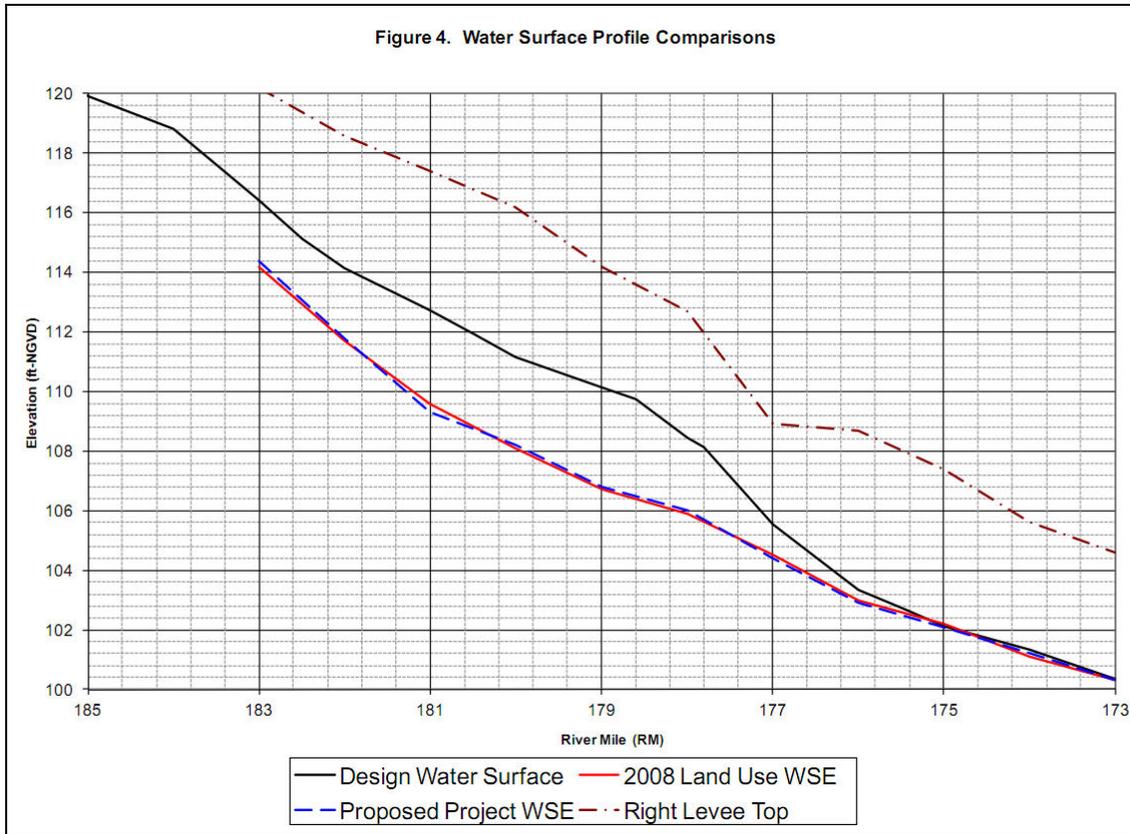
- To the extent feasible, reuse and/or recycle a minimum of 50 percent of construction and demolition waste including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard.
- To the extent feasible, water-efficient irrigation systems shall be used for the riparian restoration area.

### **3.8 Changes to Ayres 2-Dimensional Hydraulic Modeling Report (Appendix B of the Draft EIS/EIR)**

Figure 4, Water Surface Profile Comparisons, from the Ayres 2-Dimensional Hydraulic Modeling Report (Appendix B of the Draft EIS/EIR) has been revised to include RM 173 (see next page).

### **3.9 Changes to MMRP (Appendix E of the Draft EIS/EIR)**

The Final MMRP is included as Appendix A to this Final EIS/EIR and incorporates the changes identified above to some of the mitigation measures.



## APPENDIX A

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### Final Mitigation Monitoring and Reporting Program



Llano Seco Riparian Sanctuary Unit  
Restoration and Pumping Plant/Fish Screen  
Facility Protection Project

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**Final Mitigation Monitoring and Reporting Program**

***NEPA Lead Agency:***

U.S. Fish and Wildlife Service  
Sacramento River National Wildlife Refuge  
752 County Road 99W  
Willows, CA 95988

***CEQA Lead Agency:***

California Department of Fish and Wildlife  
629 Entler Avenue, Suite 12  
Chico, CA 95928

***Prepared By:***

North State Resources, Inc.  
1321 20th Street  
Sacramento, CA 95811

February 2013



# Mitigation Monitoring and Reporting Program

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This document comprises the Mitigation Monitoring and Reporting Program (MMRP) for the Llano Seco Riparian Sanctuary Unit Restoration and Pumping Plant/Fish Screen Facility Protection Project (Riparian Sanctuary project). It identifies the mitigation measures described in Chapter 3 of the draft environmental impact statement/environmental impact report (Draft EIS/EIR), as modified based on comments received on the Draft EIS/EIR, for the preferred alternative and the responsibilities of the lead agencies, U.S. Fish and Wildlife Service (Service) and California Department of Fish and Wildlife (CDFW, formerly known as the California Department of Fish and Game), and applicant, Princeton-Codora-Glenn and Provident Irrigation Districts (PCGID-PID), for implementation of the measures. The mitigation measures listed herein are required by law or regulation and will be adopted by the CDFW. The Service may adopt the measures as part of its decision process.

A mitigation measure is defined by the California Environmental Quality Act (CEQA) as one that:

- avoids an impact by not taking a certain action or parts of an action;
- minimizes an impact by limiting the degree or magnitude of an action;
- rectifies an impact by repairing, rehabilitating, or restoring the affected environment;
- reduces or eliminates an impact over time using preservation and maintenance operations throughout the life of the project; or
- compensates for an impact by creating or preserving substitute resources or environments, usually in-kind.

This MMRP includes discussions of the following: legal requirements, intent of the MMRP, the authorities and responsibilities associated with implementation of the MMRP, a mitigation measure summary and verification table, and resolution of noncompliance complaints.

## Legal Requirements

The legal basis for the development and implementation of the MMRP is found in CEQA. Under CEQA, California Public Resources Code (PRC) Sections 21002 and 21002.1 state the following:

- Public agencies are not to approve projects, as proposed, if there are feasible alternatives or feasible mitigation measures available that would substantially lessen the significant environmental effects of such projects.
- Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so.

Also under CEQA, California PRC Section 21081.6 requires the following:

- The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation.

- The monitoring program must be adopted when a public agency makes its findings under CEQA so that the program can be made a condition of project approval in order to mitigate significant effects on the environment. The program must be designed to ensure compliance with mitigation measures during project implementation to mitigate or avoid significant environmental effects.

The National Environmental Policy Act does not explicitly require the mitigation of significant impacts or adoption of a monitoring program for mitigation measures that may be adopted by a federal agency, but it does require a discussion of measures that can be taken to reduce adverse effects if such measures are not already included in the proposed action or alternatives (40 CFR Section 1502.14f).

## **Intent of the Mitigation Monitoring and Reporting Program**

The MMRP is intended to satisfy the requirements of CEQA and specify the responsibilities of the agencies for implementing mitigation measures to alleviate adverse effects of the preferred alternative. It is anticipated that the MMRP will be used by the Service and CDFW staff, other participating agencies, project contractors, and mitigation monitoring personnel during implementation of the Riparian Sanctuary project.

The primary objective of the MMRP is to ensure the effective implementation and enforcement of adopted mitigation measures. The MMRP will provide for monitoring of construction activities as needed, on-site identification and resolution of environmental problems, and proper reporting to lead agency staff. The MMRP is not only a working guide to be used to facilitate the implementation of mitigation and conservation measures by the project proponent, but also to ensure that monitoring and reporting requirements are met.

## **Responsibilities and Authority**

As the lead agencies, the Service and CDFW are responsible for monitoring implementation of the Riparian Sanctuary project and ensuring that adopted mitigation and conservation measures are implemented. The purpose of the MMRP is to document that the required mitigation measures are implemented as described in the EIS/EIR and ensure project impacts are reduced to acceptable levels, to the extent feasible. The Service and CDFW have the authority to halt any activity associated with the project if the activity is determined to be a deviation from the approved project or the adopted mitigation measures. The agencies may delegate duties and responsibilities for monitoring to other mitigation monitors or consultants as deemed necessary. They will ensure that the person(s) delegated any duties or responsibilities are qualified to monitor compliance.

The CDFW, Service, PCGID-PID, and/or delegated representatives will be responsible for implementation of the MMRP, which will include:

- ensuring that the MMRP is incorporated into the construction bid documents,
- coordinating monitoring activities,
- directing the preparation and filing of compliance reports, and
- maintaining records concerning the status of all mitigation measures.

## Monitoring Requirements

Table 1 includes the following items to track completion of each mitigation measure:

- **Mitigation Measure:** presents the mitigation measures identified in Chapter 3 of the Draft EIS/EIR, as modified by the Final EIS/EIR, for each significant impact of the preferred alternative.
- **Timing:** identifies when the mitigation measures will be implemented.
- **Responsible Party:** references the specific agency or entity responsible for implementing and monitoring the mitigation measure.
- **Verification:** provides spaces to be initialed and dated by the individual responsible for verifying compliance with each specific mitigation measure.

## Noncompliance Complaints

Complaints of noncompliance with adopted mitigation measures shall be directed to CDFW or the Service in written form, providing specific information on the alleged violation. If any complaints are received, CDFW and the Service shall conduct an investigation and determine the validity of the complaint. If noncompliance with a mitigation measure has occurred, CDFW or the Service shall take the appropriate action to remedy the violation. The person filing the complaint shall receive written confirmation indicating the results of the investigation or the final action corresponding to the particular noncompliance issue.

Complaints should be directed to either of the following agency representatives:

Daniel W. Frisk, Project Leader  
Sacramento National Wildlife Refuge Complex  
U.S. Fish and Wildlife Service  
752 County Road 99W  
Willows, CA 95988

Tracy McReynolds  
California Department of Fish and Wildlife  
629 Entler Avenue, Suite 12  
Chico, CA 95928

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**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<b><i>Geology, Fluvial Geomorphology, and Soils</i></b>			
<p><b>Mitigation Measure GS-1: Implement construction measures to reduce soil erosion.</b>                      The construction contractor will be responsible for implementing measures during all phases of construction to reduce the potential for soil erosion and indirect effects on water quality, air quality, and other resources. PCGID-PID and the Service will be responsible for ensuring that the contractor implements the measures during installation of bank protection measures and restoration activities, respectively. These measures may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>▪ Areas where ground disturbance would occur will be identified in advance of construction and limited to only those areas that have been approved by the Service (for federal lands) or Department of Water Resources (State lands).</li> <li>▪ All vehicular construction traffic will be confined to designated access routes and staging areas, as determined at the onset of construction.</li> <li>▪ Disturbance will be limited to the minimum necessary to complete all construction and restoration activities.</li> <li>▪ To the fullest extent possible, soil disturbance activities will not be conducted during significantly wet or windy weather.</li> <li>▪ Erosion and sediment control measures will be in place prior to the onset of the rainy season and will be monitored and maintained in good working condition until disturbed areas have been revegetated. If work activities take place during the rainy season, erosion control structures must be in place and operational at the end of each work day.</li> <li>▪ All stockpiles will be covered at the end of the work day during periods of wet or windy weather.</li> <li>▪ Revegetation and restoration activities would be implemented during and after construction to help stabilize soils following disturbance.</li> </ul>	During construction	Construction contractors (implementation) PCGID-PID/Service (monitoring/enforcement)	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<b>Water Resources</b>			
<p><b>Mitigation Measure WR-1: Implement measures to minimize increased turbidity levels in the Sacramento River during construction.</b></p> <p>The construction contractor will be required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), which will identify measures to be implemented during construction that will minimize disturbance to fine-grained sediments in the Sacramento River and prevent the discharge of sediment into the river from upland activities. PCGID-PID will be responsible for ensuring implementation of these measures and compliance with Basin Plan objectives during installation of bank protection measures. The SWPPP will include, but is not limited to, the following measures:</p> <ul style="list-style-type: none"> <li>▪ Fill material (quarry stone, riprap, and backfill) will be composed of washed materials from a local source. Stone materials will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Gravel and stone materials will pass California cleanliness test #227 (or equivalent test) with a value of 85 or greater. Soil-filled quarry stone will only be placed above the average water surface elevation during construction.</li> <li>▪ An effective arrangement of silt curtains will be installed downstream of the proposed location of the bank protection measures to limit the downstream transport of disturbed sediments and maintain compliance with Basin Plan water quality objectives for turbidity. In-water construction will move in an upstream direction to allow the silt curtains to sequester any mobilized materials from upstream activities. Silt curtains have been shown to be effective measures of mitigating turbidity levels in dredging operations, but curtains are less effective in water deeper than 21 feet and velocities greater than 1.6 feet per second (Francingues and Palermo 2005). Silt curtains should be installed to sequester as much disturbed sediment as possible given the current hydrologic conditions of the river (e.g., channel depth and velocities)</li> </ul>	During construction	Construction contractors (implementation) PCGID-PID (monitoring for bank protection activities) Service (monitoring for restoration activities)	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>and the performance capabilities of the silt curtains. Silt curtains will be kept in normal working order and allow fish that may enter the curtained area adequate room to exit the area freely. Curtains will also be installed such that they do not prohibit the free movement of fish in the Sacramento River or inhibit or restrict boat traffic. Silt curtains will be left in place until the completion of all in-water work.</p> <ul style="list-style-type: none"> <li>▪ Suitable erosion and sediment control structures (e.g., silt fences, straw wattles, or catch basins) will be used to capture impeded erosion or sediment from upland and near-channel activities before it enters the Sacramento River. Sediment control structures will be placed near the edge of surface water features (i.e., along the bank of the river or along wetland features) to ensure sediment is sequestered before entering the water column. These structures will be installed prior to the start of any construction activities and will need to be cleaned or maintained on a regular basis to retain their effectiveness.</li> <li>▪ Bare soil will be kept to the minimum required by designs. Erosion control devices or measures, such as those listed previously, will also be used in areas where vegetation has been removed to reduce short-term erosion prior to the start of the rainy season and before new vegetation becomes established.</li> <li>▪ All imported fill material stockpiles will be stored in upland areas with erosion controls properly installed and maintained. All applicable erosion control standards will be required during stockpiling of materials.</li> <li>▪ To the maximum extent practicable, activities that increase the potential for erosion in the project area will be restricted to the relatively dry summer and early fall periods to minimize the potential for rainfall events to transport sediment to the river. If these activities must take place during the late fall, winter, or spring, temporary erosion and sediment control structures will be in place and operational at the end of each construction day and maintained until permanent erosion control is in place.</li> </ul>			

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<ul style="list-style-type: none"> <li>▪ If on-site erosion control devices are found to be nonfunctional, they will be repaired or replaced immediately or by the end of the work day. In cases where repairs cannot be made immediately for safety reasons, the repairs should be completed as soon as the work can safely be performed.</li> <li>▪ Disturbed areas will be revegetated with either native grass planting (hydroseeding) or willow cuttings immediately following construction.</li> </ul> <p>The Service will also be responsible for implementation of erosion control and water quality protection measures during restoration activities, including using erosion and sediment control structures, minimizing bare soil, implementing activities during dry periods as feasible, and revegetating disturbed areas, as listed above.</p>			
<p><b>Mitigation Measure WR-2: Implement measures during construction and restoration activities to prevent accidental discharge of potentially hazardous materials.</b></p> <p>The construction contractor will be responsible for implementing the construction measures listed below to prevent hazardous materials from entering the water column during all construction activities, and the Service will be responsible for ensuring all herbicide use in the project area complies with the herbicide-related measures listed below. Construction measures include:</p> <ul style="list-style-type: none"> <li>▪ Equipment and materials will be stored a minimum of 200 feet away from wetland and surface water features.</li> <li>▪ Vehicles and equipment used during construction will receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of hazardous materials.</li> <li>▪ All construction equipment will be inspected daily for leaks prior to the start of any activities. Steam cleaning will be used to remove any oil, grease, or hydraulic fluid prior to making contact with the waters of the Sacramento River. Untreated wash and rinse water must be adequately treated prior to discharge into the river if that is the desired disposal option.</li> <li>▪ Hazardous materials, including fuels, oils, and solvents, will</li> </ul>	<p>During construction and maintenance</p>	<p>Construction contractors (implementation) PCGID-PID (monitoring for bank protection activities) Service (monitoring for restoration activities)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>not be stored or transferred within 150 feet of the active Sacramento River channel. Areas for fuel storage, refueling, and servicing will also be located at least 150 feet from the active river channel or within an adequate secondary fueling containment area. In addition, the construction contractor will be responsible for maintaining spill containment booms on-site at all times during construction operations and staging of equipment or fueling supplies. Fueling trucks will maintain a spill containment boom at all times.</p> <ul style="list-style-type: none"> <li>▪ The contractor will develop and implement site-specific best management practices, a water pollution control plan, and emergency spill control plan and will be responsible for immediate containment and removal of any toxins released into the Sacramento River or project area.</li> </ul> <p>Herbicide application measures include:</p> <ul style="list-style-type: none"> <li>▪ To control drift during spray applications, spray applications will follow a site-specific prescription that accounts for terrain and identifies spray exclusion areas, buffer areas, formulation, equipment, droplet size, spray height, application pattern, flow rate, limiting factors of wind speed and direction, temperature, and relative humidity.</li> <li>▪ An herbicide spill contingency plan will be developed and implemented for the use of any herbicides.</li> <li>▪ The application of herbicides will strictly adhere to the manufacture’s instructions, the Service’s Pesticide Use Proposal process, and the Sacramento River NWR Complex Integrated Pest Management Plan(Appendix F to U.S. Fish and Wildlife Service 2009).</li> <li>▪ All herbicides will be mixed and used according to their labeled specifications, and the mixing or storage of herbicides will take place more than 100 feet from the Sacramento River. Basal and foliar application of herbicides will also be prohibited within 100 feet of the Sacramento River. Removal of weeds within 100 feet of the Sacramento River will be restricted to mechanical methods, including</li> </ul>			

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>disking, floating, mowing, and chopping prior to seed set.</p> <ul style="list-style-type: none"> <li>▪ The cleaning and disposal of herbicide containers will be completed in accordance with federal, state, and local laws, regulations, and guidance.</li> </ul>			
<b><i>Fishery Resources</i></b>			
<p><b>Mitigation Measure FR-1: Implement measures to minimize the injury or mortality of rearing and migratory juvenile anadromous and resident fishes.</b></p> <p>The construction contractor retained by PCGID-PID for installation of the bank protection measures will be required to minimize in-water activities and to operate equipment slowly and deliberately to alert and scare adult and juvenile salmonids away from the work area. The contractor will be instructed that, before submerging an excavator bucket or laying riprap below the water surface, the excavator bucket will be operated to “tap” the surface of the water, or a person will wade ahead of the equipment to scare fish away from the work area. To avoid impacts to mobile life stages of salmonids that may be present in the water column, the first layers of clean materials that are being placed into the wetted channel will be added slowly and deliberately to allow fish to move from the work area. These measures will avoid or minimize potential injury to and mortality of fish during in-water activities.</p>	During construction	Construction contractor (implementation) PCGID-PID (monitoring for bank protection activities)	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<b><i>Vegetation, Wildlife, and Sensitive Biological Resources</i></b>			
<p><b>Mitigation Measure VW-2: Compensate for the loss of jurisdictional wetlands in the riparian restoration designs.</b>                      The Service will be responsible for ensuring that the riparian restoration plan for the site-specific plantings at the Riparian Sanctuary incorporates measures to protect riparian wetlands in place, where feasible, and to restore similar quality riparian wetlands on-site if avoidance is not feasible. On-site mitigation is encouraged by the Corps and CDFW, and the restoration activities would restore riparian habitat on 400 acres of the Riparian Sanctuary. A wetlands mitigation and monitoring plan would need to be prepared and submitted to the Corps and CDFW for review and approval as part of their permitting processes; the riparian restoration plan prepared by River Partners may be submitted in place of a separate wetlands plan if the information required by the agencies is included in it. The plan will need to discuss the restoration plans to compensate for the loss of riparian wetlands and identify monitoring parameters and performance criteria for each parameter to ensure the success of the restored wetlands. The riparian restoration or wetlands plan will include the following measures:</p> <ul style="list-style-type: none"> <li>▪ The total acreage of impacts to jurisdictional wetlands will be calculated based on the final design of the bank protection measure and the delineation of waters of the United States, once verified by the Corps. This acreage will be used to determine the total acreage of replacement wetlands needed.</li> <li>▪ All replacement wetlands will be restored on-site, which may include areas at the Riparian Sanctuary, particularly along the river, or on Llano Seco Island 2 (Service-managed lands). Riparian wetlands lost will be replaced to provide similar function (e.g., planted within the OHWM to provide instream cover for fish and other aquatic wildlife).</li> <li>▪ Jurisdictional wetlands affected by the bank protection measures will be replaced at a 1:1 ratio of acres permanently lost to acres of on-site replacement wetlands. This ratio is subject to the final recommendations made by the Corps and CDFW. It is based on the assumption that the overall</li> </ul>	<p>Prior to and during construction</p>	<p>Service (planning)                      Construction contractor (implementation)                      Service/Corps/CDFW (monitoring for restoration activities)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>restoration design provides a substantial benefit by restoring approximately 400 acres of mixed density riparian habitat.</p> <ul style="list-style-type: none"> <li>▪ Planted species will consist of the same species as those removed (e.g., red willow, narrow leaved willow). Stems will be planted at three (3) stems per planting to help ensure successful establishment of at least one vigorous plant for each plant removed.</li> <li>▪ Impacts to herbaceous cover in the jurisdictional wetlands will be offset by reseeding any unvegetated and disturbed areas with a suitable seed mixture after construction; by using plugs of rushes, sedges, or other native vegetation taken by hand from plants in adjacent riparian wetland habitat; or from CDFW-approved nursery sources.</li> <li>▪ The restored wetlands will be monitored according to performance criteria identified in the plan and per the conditions of the Corps permit. Typical performance criteria may include ensuring species diversity is equal to or greater than that for selected reference areas (e.g., existing riparian woodlands located in or adjacent to the project area) and that density (stems per acre) of woody riparian species is equal to or greater than that for selected reference areas (e.g., existing riparian woodlands located in or adjacent to the project area).</li> <li>▪ Construction fencing will be erected along the outer edges of the construction zone where needed to prevent accidental entry into existing riparian habitat.</li> <li>▪ Equipment and materials will be stockpiled or stored outside of existing or restored riparian habitat.</li> </ul>			
<p><b>Mitigation Measure VW-4a: Protect preserved elderberry shrubs during construction.</b>                      The construction contractor retained by PCGID-PID or the Service will be required to implement protection measures around elderberry shrubs that are to be preserved in the project area during construction activities. These measures will be verified and refined, as necessary, by the Service during ESA consultation and may include the following:</p>	<p>Prior to and during construction</p>	<p>Service (Section 7 consultation)                      Construction contractor (implementation)                      PCGID-PID (monitoring for bank protection activities)                      Service (monitoring for restoration activities)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<ul style="list-style-type: none"> <li>▪ The locations of elderberry shrubs to be preserved will be clearly identified on construction plans.</li> <li>▪ Plywood boxes will be constructed around all preserved elderberry shrubs in areas where bank protection measures would be installed. A biological monitor will be present during construction of the plywood boxes to ensure that all elderberry shrubs intended for preservation are identified and adequately protected prior to vegetation clearing or any ground disturbing activities.</li> <li>▪ Exclusionary fencing will be installed 20 feet from the dripline of elderberry shrubs that are not protected by plywood boxes and that will be preserved elsewhere in the project area during construction and restoration activities. This buffer may be modified at the discretion of the Service for site-specific plantings near existing elderberry shrubs.</li> <li>▪ Signs and fencing will be erected in accordance with the Service's Conservation Guidelines for the Valley Elderberry Longhorn Beetle (U.S. Fish and Wildlife Service 1999).</li> <li>▪ A qualified biologist will conduct worker environmental awareness training to ensure that construction workers are able to identify and appropriately avoid elderberry shrubs.</li> </ul>			
<p><b>Mitigation Measure VW-4b: Implement a mitigation plan for elderberry shrubs that must be removed.</b></p> <p>The Service (Sacramento River NWR) will be responsible for preparing a mitigation plan to identify measures to replace or replant elderberry shrubs that must be removed during construction. This plan may be incorporated into the riparian restoration plan and will be reviewed and approved by the Service as part of the ESA consultation process. The measures identified in the mitigation plan may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>▪ The locations of elderberry shrubs to be removed or transplanted will be clearly identified on construction plans.</li> <li>▪ As part of the restoration design, elderberry stems removed will be mitigated in accordance with the Service's Conservation Guidelines for the Valley Elderberry Longhorn</li> </ul>	<p>Prior to and during construction</p>	<p>Service (planning) Construction contractor (implementation) Service (monitoring for restoration activities)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>Beetle (U.S. Fish and Wildlife Service 1999). A qualified biologist will record the number of stems to be removed so that the design can incorporate appropriate replacement ratios of elderberries and associated riparian plants.</p> <ul style="list-style-type: none"> <li>▪ All transplant and replacement shrubs will be planted within the restoration area of the Riparian Sanctuary and will be incorporated into the restoration design.</li> </ul>			
<p><b>Mitigation Measure VW-5: Conduct pre-construction surveys for nesting bank swallows and install netting along the bank.</b>            All construction and restoration activities that involve ground disturbance and use of equipment near the banks of the Sacramento River between RM 177 and RM 178.2 will be scheduled outside of the nesting period for bank swallows (i.e., schedule these activities between August 1 and March 31), to the extent possible. If these activities must take place during the nesting period, PCGID-PID, the Service, or the construction contractors retained by PCGID-PID and the Service will be responsible for retaining a qualified biologist to conduct a pre-construction survey in potential bank swallow habitat along the banks of the Sacramento River adjacent to the Riparian Sanctuary at about RM 178.2 (for bank protection measures) and at about RM 177 (for restoration activities) prior to bank swallows arriving in the area (see River Partners 2011 for map of potential habitat locations). The survey will be conducted in February of the same year that construction is scheduled for the bank protection measure and site preparation is scheduled for restoration activities; multiple surveys may be necessary if these activities are scheduled in different years. The biologist will assess the suitability of the habitat for nesting bank swallows and determine if bank swallows could occupy the habitat during the nesting period. If the habitat is determined to be unsuitable for bank swallow nesting, no additional construction measures are necessary. However, if the habitat has become suitable, the contractor will be responsible for installing netting along the bank prior to bank swallows arriving in the area (i.e., during the first week of March) and under the supervision of a qualified biologist. The netting will consist of a plastic net or poultry wire with a mesh size of about 3/4 to 1 inch. The netting will remain in place until construction</p>	<p>Prior to and during construction</p>	<p>Construction contractor, PCGID-PID, and/or the Service (implementation)            CDFW (monitoring)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>activities commence for the bank protection measure, and it can be removed once construction of the bank protection starts. For restoration activities, the netting will remain in place until the end of the nesting period. A qualified biologist will monitor the netting weekly between the time it is installed and construction commences and conduct a survey the day prior to the start of construction to ensure no bank swallows have occupied the habitat.</p>			
<p><b>Mitigation Measure VW-6: Conduct pre-construction surveys for nesting special-status bird species, raptors, special-status mammals, and special-status reptiles.</b>            PCGID-PID or the construction contractor retained by PCGID-PID or the Service will be responsible for retaining a qualified biologist to conduct pre-construction surveys prior to any activities scheduled during the nesting season (February 15 through September 15) and implementing measures to avoid activities near active nest sites. Surveys will be repeated each year if activities would commence in subsequent years during the nesting period. The following specific measures will be implemented:</p> <ul style="list-style-type: none"> <li>▪ All construction activities (e.g., construction of spur dikes, site-specific planting preparation), including pruning and trimming of vegetation, will be supervised by a qualified biologist.</li> <li>▪ For Swainson's hawk, a qualified biologist will conduct a pre-construction survey of accessible areas within a 0.5-mile radius of the area where activities would be implemented on the Riparian Sanctuary and upstream peninsula between March 1 and September 15; the required survey radius may be reduced (on a case-by-case basis) if approved in advance by CDFW, but in no case will be less than 500 feet. At least one survey will be conducted no more than 1 week prior to the initiation of the activities. If no active nests are located, no further measures are necessary to avoid impacts to active Swainson's hawk nests. If active nests are identified, the following measures will be implemented:               <ul style="list-style-type: none"> <li>○ A no-disturbance buffer zone will be established around the nest site. The width of the buffer zone will be determined by</li> </ul> </li> </ul>	<p>Prior to and during construction</p>	<p>Construction contractor or PCGID-PID (implementation)            PCGID-PID (monitoring for bank protection activities)            Service (monitoring for restoration activities)            CDFW (consultation)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>a qualified biologist in coordination with CDFW. Determination of the required width of the buffer zone will consider the distance of the nest site from construction activities, the line of sight from the nest site to construction activities, the existing level of disturbance, and other factors established with CDFW on a case-by-case basis.</p> <ul style="list-style-type: none"> <li>○ A qualified biologist will monitor active nests within 500 feet (or the width of the buffer zone) of construction activities. The first monitoring event will coincide with the initial implementation of construction activities and monitoring will continue a minimum of once a week until the young have fledged. If the biologist determines that construction activities are disturbing the birds and nest failure is possible, CDFW will be immediately notified. Measures to avoid nest failure will be implemented in coordination with CDFW and may include halting some or all construction activities until the young have fledged. For monitored nest sites, a monitoring report will be submitted to CDFW within 2 weeks after termination of monitoring activities.</li> <li>▪ For special-status migratory birds, a qualified biologist will conduct a pre-construction survey no more than 2 weeks prior to commencement of construction or restoration activities scheduled between March 1 and August 31. The pre-construction survey will be used to determine if active nests of these species are present in or within 250 feet of where construction activities would take place. If an active nest is found, a qualified biologist in consultation with CDFW will determine the extent of a construction-free buffer zone to be established around the nest. If no active nests are identified, no further mitigation is necessary.</li> <li>▪ For common raptors, a qualified biologist will conduct a pre-construction survey in all suitable upland and riparian habitat no more than 2 weeks prior to commencement of construction or restoration activities scheduled between February 15 and August 31. If an active nest is found, a qualified biologist, in consultation with CDFW, will determine a construction-free buffer zone to be established around the</li> </ul>			

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>nest until the young have fledged. In consultation with CDFW, a plan will be developed to monitor whether construction activity is disturbing the reproductive process and to determine when the young have fledged. If no active nests are identified, no further mitigation is necessary.</p> <ul style="list-style-type: none"> <li>▪ If a western pond turtle is observed in the project area during construction activities, the contractor will temporarily halt construction until the turtle has moved itself to a safe location outside of the construction limits. If construction is to occur during the nesting season (late June–July), a pre-construction survey will be conducted by a qualified biologist to locate any western pond turtles or their nests. This survey will be conducted within 660 feet of the northwestern portion of the Riparian Sanctuary no more than 2 days prior to the start of construction or restoration activities in suitable habitat. If a pond turtle nest is found, the biologist will flag the site and determine whether construction activities can avoid affecting the nest. If the nest cannot be avoided, in consultation with CDFW, a no-disturbance buffer zone may be established around the nest until the young have left the nest.</li> </ul>			

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<b><i>Cultural Resources</i></b>			
<p><b>Mitigation Measure CR-1a: Provide an archaeological monitor during all activities at the Riparian Sanctuary near site CA-BUT-2658.</b>                      The Service will be responsible for retaining a qualified professional archaeologist to monitor all activities near site CA-BUT-2658 during all phases of the project. Daily monitoring of the site will take place during the initial restoration activities, especially during preparation and planting activities. Periodic monitoring will take place during maintenance and monitoring activities, such as mowing and herbicide application, over the long term to ensure resources at the site are adequately protected and no alterations to the site take place. A representative from the Mechoopda Tribe may monitor any activities that could disturb the site, including maintenance activities, in order to help prevent any unnecessary disturbance or impacts to the resources, and a cultural resource member of the tribe will be present during restoration activities in order to collect and re-bury any culturally significant materials that are brought to the surface during this activity. Monitoring will help reduce accidental damage due to project activities and prevent movement of individual artifacts from the site though casual or purposeful collection.</p>	During and following construction	Service (implementation and monitoring)	
<p><b>Mitigation Measure CR-1b: Allow only native grass restoration and minimal maintenance within the boundaries of site CA-BUT-2658.</b>                      The Service will modify the restoration plans to only include native grass restoration within the boundaries of site CA-BUT-2658 and to restrict maintenance activities at the site. If the effects of native grass seeding and maintenance can be shown to have no effect on site CA-BUT-2658, the restoration plans will allow for limited application of native grasses on the site. In consultation with the Mechoopda Tribe, the following activities will be allowed for site preparation and application of seeds: prescribed burn, herbicide application, and use of a no-till drill for seed application. Other treatment methods, such as hand pulling of invasive species, will be allowed at the discretion of the Service archaeologist. The following activities will not be allowed:</p>	During and following construction	Service (implementation and monitoring)	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>disking for site preparation, mechanical mowing for maintenance over the long term, and other ground disturbance that might damage resources at the site. The site will be fenced or marked off during restoration activities, and an archaeological monitor will be present during seeding and maintenance activities. Any fencing or other boundary markings will be removed at completion of the restoration plantings.</p>			
<p><b>Mitigation Measure CR-2a: Implement treatment measures and record previously undiscovered resources.</b>            The construction contractor will comply with relevant measures in the Sacramento River NWR CCP and Cultural Resources Overview and Management Plan if potential cultural resources are discovered during construction or restoration activities. If a discovery is made, the Service archaeologist will be notified immediately, and the resource will be examined by a qualified professional archaeologist to determine if it is a cultural resource. Any cultural resources discovered during construction will be recorded according to accepted contemporary standards and evaluated to determine their eligibility for listing in the National Register and CRHR. Impacts on the resources, if any, will be evaluated, and specific treatment measures will be identified in consultation with the State Historic Preservation Officer and the Service to determine the appropriate course of action if eligible resources would be adversely affected. Specific measures may be implemented to reduce adverse impacts, such as data recovery and curation of recovered materials or protection in place by avoiding the resource.</p>	<p>During construction</p>	<p>Construction contractors (implementation)            Service (monitoring and consultation)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p><b>Mitigation Measure CR-2b: Implement treatment measures for human remains.</b>                      The construction contractor will comply with appropriate measures in the Sacramento River NWR CCP and Cultural Resources Overview and Management Plan if human remains are discovered during construction or restoration activities. Regarding human remains, “any individual who has knowingly and inadvertently discovered human remains on Federal lands must provide immediate telephone notification of the inadvertent discovery, with written confirmation, to the responsible Federal agency official” (White 2003: 125). In addition, all activity in the area must stop. The appropriate steps are laid out in the Cultural Resource Overview and Management Plan for the Sacramento River Conservation Area (White 2003: 124-127). If a discovery is made, the Service archaeologist and County coroner will be notified immediately, and the Service will notify local Native American tribes and the Native American Heritage Commission, as appropriate. Discoveries on federal lands are subject to the Native American Graves Protection and Repatriation Act. The ancestry of the remains will be determined if feasible and with minimal disturbance of the remains. All human remains and associated burial artifacts encountered will be protected and assessed in a respectful and dignified manner. If removal is necessary, it will be undertaken with a Native American representative present (if appropriate), and the remains will be treated according to the provisions set forth in Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the California Public Resources Code.</p>	<p>During construction</p>	<p>Construction contractors (implementation)                      Service (monitoring and consultation)</p>	
<p><b><i>Air Quality</i></b></p>			
<p><b>Mitigation Measure AQ-1: Implement a fugitive dust and emissions reduction plan.</b>                      The construction contractor will be responsible for preparing and implementing a fugitive dust and emissions reduction plan to limit fugitive dust, particulate matter, and GHG emissions. The plan will identify measures to be implemented during construction activities and will be reviewed and approved by the local air districts, the Service, and PCGID-PID. The Service and PCGID-PID will be responsible for</p>	<p>Prior to and during construction and maintenance</p>	<p>Construction contractors (planning and implementation)                      Service and PCGID-PID (plan approval)                      PCGID-PID (monitoring for bank protection activities)                      Service (monitoring for restoration activities)</p>	

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<p>ensuring the contractor implements the measures during construction activities. Applicable measures will also be implemented during longer term maintenance activities, as appropriate. Measures identified in the plan may include, but are not limited to, the following from the Butte County Air Quality Handbook (Butte County Air Quality Management District 2008):</p> <ul style="list-style-type: none"> <li>▪ A water truck will be on-site at all times. Water will be applied to disturbed areas a minimum of two times per day or more as necessary, and all visibly dry disturbed areas and unpaved roads will be watered to minimize dust emission.</li> <li>▪ Soil pile surfaces will be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic, or other material may be required to further reduce dust emissions.</li> <li>▪ Water will be applied by means of truck(s), hoses, and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission.</li> <li>▪ Unpaved roads may be graveled to reduce dust emissions at the discretion of the Service.</li> <li>▪ Haul roads will be sprayed down at the end of the work shift to form a thin crust. This application of water will be in addition to the minimum rate of application.</li> <li>▪ Haul vehicles transporting soil into or out of the property will be covered pursuant to California Vehicle Code Section 23114.</li> <li>▪ On-site vehicles will be limited to a speed that minimizes dust emissions on unpaved roads.</li> <li>▪ Vehicles entering or exiting the construction area will travel at a speed that minimizes dust emissions.</li> <li>▪ Construction workers will park in designated parking area(s) to help reduce dust emissions.</li> <li>▪ A publicly visible sign with the telephone number and person to contact regarding dust complaints will be posted in a publicly accessible area near the project area (such as along SR 45). This person will respond to complaints and take corrective action within 24 hours. The telephone number of the Butte and Glenn County air districts will also be visible.</li> </ul>			

**Table 1. Mitigation Measures and Monitoring Requirements**

Mitigation Measure	Timing	Responsible Parties	Verification (Date/Initials)
<ul style="list-style-type: none"> <li>▪ Unnecessary vehicle idling will be limited to 5 minutes.</li> <li>▪ All construction equipment will be maintained in proper tune according to manufacturer’s specifications.</li> <li>▪ Contractors will commit to using the best available emissions control technology. The use of diesel construction equipment meeting ARB’s 1996 or newer certification standard for off-road heavy-duty diesel engines and having Tier 4 engines will be maximized to the extent feasible. Equipment may be electrified if feasible, and gasoline-powered equipment should be substituted for diesel-powered equipment where feasible, unless alternatively fueled construction equipment can be used. If the use of all equipment with Tier 4 engine standards is not feasible, the contractor should commit to using ARB and EPA-verified particulate traps, oxidation catalysts, and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants during construction.</li> <li>▪ Onroad heavy-duty haul trucks shall be model year 2000, or newer, or shall meet equivalent model year emissions standards.</li> <li>▪ All construction equipment shall be electrified, when feasible, and gasoline-powered equipment shall be substituted for diesel-powered equipment, where feasible, unless alternatively fueled construction equipment can be used.</li> <li>▪ A construction traffic and parking management plan will be developed and implemented to maintain traffic flow and minimize vehicle trips.</li> </ul> <p>Additional measures to reduce GHG emissions include:</p> <ul style="list-style-type: none"> <li>▪ To the extent feasible, reuse and/or recycle a minimum of 50 percent of construction and demolition waste including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard.</li> <li>▪ To the extent feasible, water-efficient irrigation systems shall be used for the riparian restoration area.</li> </ul>			

## APPENDIX B

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Air Quality Modeling Report for the Riparian Sanctuary Project





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Paso Robles, CA 93446  
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November 11, 2012

Leslie Perry (Wagner)  
Environmental Analyst  
North State Resources, Inc.  
5000 Bechelli Lane, Suite 203  
Redding, CA 96002

**RE: Air Quality Modeling Report for the Riparian Sanctuary Project, Butte County, California.**

Dear Ms. Perry:

This report has been prepared to provide quantification of criteria air pollutant and greenhouse gas emissions associated with the proposed Riparian Sanctuary Project located in Butte County, California. The modeling was conducted for both unmitigated and mitigated conditions for each construction phase attributable to the proposed project.

In addition, please be aware that the recommended mitigation measures identified in the previous draft environmental document have been revised. The previous environmental document identified mitigation that would require the project to utilize offroad equipment meeting Tier 4 emissions standards. Tier 4 standards are being phased in from 2008 through 2015. Tier 4 standards have been divided into "Interim" and "Final" standards. The Interim Tier 4 requirements allow manufacturers additional time to develop technologies sufficient to achieve the Tier 4 oxides of nitrogen (NO<sub>x</sub>) requirements. Diesel-exhaust particulate (DPM) standards are the same for both Tier 4 Interim and Final. Because Tier 4 emissions standards have not yet been fully implemented, the availability of equipment meeting these standards is somewhat limited. As a result, I would recommend that this mitigation measure be revised to reflect the use of equipment meeting Tier 3, or newer, emissions standards. A summary of tier emissions standards for offroad equipment has been included in Appendix B of this report.

As noted in the report, a large percentage of the construction generated emissions is attributable to the use of heavy-duty haul trucks for transporting of quarry stone and soil. A recommended mitigation measure has been included to reduce emissions from this source. Recommended mitigation measures have also been included to reduce GHG emissions attributable to the proposed project.

Please feel free to call me if you have any questions.

Thank you,

A handwritten signature in black ink, appearing to read "K. Legleiter".

Kurt Legleiter  
Principal



## AIR QUALITY

### REGULATORY FRAMEWORK

Air quality within the NSVAB is regulated by several jurisdictions including the US Environmental Protection Agency (EPA), California Air Resources Board (CARB), the Butte County Air Quality Management District (BCAQMD) and the Glenn County Air Pollution Control District (GCAPCD). Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation. Although US EPA regulations may not be superseded, both state and local regulations may be more stringent.

#### FEDERAL

##### U.S. Environmental Protection Agency

At the federal level, the US EPA has been charged with implementing national air quality programs. The US EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

##### Federal Clean Air Act

The FCAA required the US EPA to establish National Ambient Air Quality Standards (NAAQS), and also set deadlines for their attainment. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. NAAQS are summarized in **Table 3**.

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The US EPA has responsibility to review all state SIPs to determine conformance with the mandates of the FCAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If the US EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures.

##### National Emission Standards for Hazardous Air Pollutants

Pursuant to the FCAA of 1970, the US EPA established the National Emission Standards for Hazardous Air Pollutants (NESHAP). These are technology-based source-specific regulations that limit allowable emissions of HAPs.



**Table 1**  
**Summary of Ambient Air Quality Standards & Attainment Designations**

Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary	Attainment Status
Ozone (O <sub>3</sub> )	1-hour	0.09 ppm	Non- Attainment	–	Non-Attainment (Extreme)**
	8-hour	0.070 ppm		0.075 ppm	
Particulate Matter (PM <sub>10</sub> )	AAM	20 µg/m <sup>3</sup>	Non-Attainment	–	Attainment
	24-hour	50 µg/m <sup>3</sup>		150 µg/m <sup>3</sup>	
Fine Particulate Matter (PM <sub>2.5</sub> )	AAM	12 µg/m <sup>3</sup>	Non-Attainment	15 µg/m <sup>3</sup>	Non-Attainment
	24-hour	No Standard		35 µg/m <sup>3</sup>	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Maintenance
	8-hour	9 ppm		9 ppm	
Nitrogen Dioxide (NO <sub>2</sub> )	AAM	0.030 ppm	Attainment	0.053 ppm	Attainment/ Unclassified
	1-hour	0.18 ppm		0.100 ppb	
Sulfur Dioxide (SO <sub>2</sub> )	AAM	–	Attainment	0.03 ppm	Attainment/ Unclassified
	24-hour	0.04 ppm		0.14 ppm	
	3-hour	–		0.5 ppm (1300 µg/m <sup>3</sup> )***	
	1-hour	0.25 ppm		75 ppb	
Lead	30-day Average	1.5 µg/m <sup>3</sup>	Attainment	–	No Designation/ Classification
	Calendar Quarter	–		1.5 µg/m <sup>3</sup>	
	Rolling 3-Mo.Avg.	–		0.15 µg/m <sup>3</sup>	
Sulfates	24-hour	25 µg/m <sup>3</sup>	Attainment	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m <sup>3</sup> )	Unclassified		
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m <sup>3</sup> )	Attainment		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer- visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70%.	Unclassified		

\* For more information on standards visit :<http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>

\*\* No federal 1-hour standard. Reclassified extreme nonattainment for the federal 8-hour standard May 5, 2010.

\*\*\*Secondary Standard

Source: CARB 2012



## STATE

### California Air Resources Board

The CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act of 1988. Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing California Ambient Air Quality Standards (CAAQS), which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles. The CAAQS are summarized in **Table 3**. The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel and engine used.

### California Clean Air Act

The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO<sub>2</sub>, and NO<sub>2</sub> by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

### BCAQMD & GCAPCD

The BCAQMD and the GCAPCD are the agencies primarily responsible for ensuring that NAAQS and CAAQS are not exceeded within their respective counties. Responsibilities of the BCAQMD and the GCAPCD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA.

## **REGULATORY ATTAINMENT DESIGNATIONS**

Under the CCAA, the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. Depending on the frequency and



severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data does not support either an attainment or nonattainment designation. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The US EPA designates areas for ozone, CO, and NO<sub>2</sub> as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For SO<sub>2</sub>, areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used. The US EPA uses the same sub-categories for nonattainment status: serious, severe, and extreme. In 1991, US EPA assigned new nonattainment designations to areas that had previously been classified as Group I, II, or III for PM<sub>10</sub> based on the likelihood that they would violate national PM<sub>10</sub> standards. All other areas are designated “unclassified.”

Butte County is currently designated as a nonattainment area with respect to the state ozone, PM<sub>2.5</sub>, and PM<sub>10</sub> standards and nonattainment of the national 8-hour ozone and PM<sub>2.5</sub> standards. Glenn County is designated nonattainment of the state ozone and PM<sub>10</sub> standards. Both counties are designated either attainment or unclassified for all remaining state and national ambient air quality standards.

## METHODOLOGY

Short-term construction emissions associated with the proposed project were calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1. Emissions were quantified based on the estimated duration of construction activities, equipment use, and vehicle trips provided by the project engineer. Emissions of ROG, NO<sub>x</sub>, PM<sub>10</sub>, were compared to the CCAPCD’s recommended significance thresholds for determination of impact significance. For informational purposes, emissions of PM<sub>2.5</sub> were also quantified. Because a detailed construction schedule has not yet been identified, construction-generated emissions were quantified for both summer and winter conditions. Modeling assumptions and output files are included in **Appendix A** of this report.

## THRESHOLDS OF SIGNIFICANCE

The evaluation of project-related air quality impacts was based on thresholds of significance developed by the Butte County Air Quality Management District (BCAQMD), as identified in the BCAQMD’s *CEQA Air Quality Handbook, Guidelines for Assessing Air Quality Impacts for Projects Subject to CEQA Review* (January 2008). Applicable thresholds are summarized in **Table 2**.



**Table 2  
 Recommended Thresholds of Significance  
 for Criteria Air Pollutants of Primary Concern**

Pollutant	Level A	Level B	Level C
NO <sub>x</sub>	≤ 25 lbs/day	> 25 lbs/day	> 137 lbs/day
ROG	≤ 25 lbs/day	> 25 lbs/day	> 137 lbs/day
PM <sub>10</sub>	≤ 80 lbs/day	> 80 lbs/day	> 137 lbs/day

**Level A:** Any project which has the potential to emit up to the Level A thresholds would be considered to have a potentially significant impact and should implement Standard Mitigation Measures.

**Level B:** Projects which exceed Level B thresholds should select as many best available mitigation measures (BAMM), in addition to the recommended list of standard mitigation measures.

**Level C:** Projects which exceed the Level C thresholds would be considered to have a significant impact.

Source: BCAQMD 2008

The GCAPCD has not yet adopted recommended thresholds of significance. In the interim, the GCAPCD recommends use of the above thresholds of significance, as recommended by the BCAQMD. Accordingly, construction impacts associated with the proposed project would be considered significant if project-generated emissions would exceed BCAQMD-recommended significance thresholds, as identified in **Table 2**, and recommended control measures are not incorporated.

**CONSTRUCTION-GENERATED EMISSIONS: PREFERRED ALTERNATIVE (ALTERNATIVE 4)**

The construction of the proposed project would result in the temporary generation of emissions associated with site preparation, grading, excavation, quarry stone installation, and motor vehicle trips. Estimated construction-generated daily emissions associated with the various construction phases and activities are summarized in **Tables 3 and 4** for summer and winter conditions, respectively.

Based on the modeling conducted, maximum daily emissions exceeding the BCAQMD's recommended significance thresholds would largely occur during Phase I of the proposed project associated with the installation of quarry stone and backfill/soil cover. Emissions would be largely attributable to the use of onroad heavy-duty trucks for the hauling of construction materials. As indicated in **Table 4**, construction-generated emissions would be slightly higher during the winter months due to changes in onroad vehicle emission rates. As depicted in Table 4, maximum daily emissions occurring during Phase I of the proposed project would total approximately 14.06 pounds per day (lbs/day) of ROG, 162.48 lbs/day of NO<sub>x</sub>, 174.63 lbs/day of PM<sub>10</sub>, and 6.85 lbs/day of PM<sub>2.5</sub>. Estimated construction-generated emissions would exceed the BCAQMD's Level C significance thresholds of 137 lbs/day for NO<sub>x</sub> and PM<sub>10</sub>. Estimated daily emissions of NO<sub>x</sub> during Phase II would exceed the BCAQMD's Level B significance threshold of 25 lbs/day for NO<sub>x</sub>. No exceedance of BAAQMD's significance thresholds is estimated to occur during Phase III of the proposed project.



**Table 3  
 Construction-Generated Emissions (Unmitigated) - Summer Conditions**

Construction Phase/Activity	Maximum Daily Emissions (lbs/day) <sup>1</sup>			
	ROG	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Phase I</b>				
Mobilization	0.15	1.88	0.34	0.07
Site Preparation/Grading	7.06	55.03	2.54	2.18
Excavation/Fill	4.69	39.20	8.03	1.79
Quarry Stone Installation	13.84	158.81	174.60	6.82
Soil Filled Quarry Stone Installation	13.58	155.48	79.23	6.69
Backfill/Soil Cover	12.23	138.21	63.50	5.96
<b>Maximum Daily Emissions:</b>	<b>13.84</b>	<b>158.81</b>	<b>174.60</b>	<b>6.82</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>Yes/Yes</b>	<b>Yes/Yes</b>	<b>--</b>
<b>Phase II</b>				
Mobilization	0.15	1.88	0.25	0.07
Site Preparation	5.42	40.1	2.71	1.87
Rock Removal	4.41	38.66	41.33	1.90
Excavation	3.83	35.72	11.42	1.56
Quarry Stone Installation	5.15	50.38	24.10	2.24
Soil Cover	3.50	26.41	1.40	1.17
<b>Maximum Daily Emissions:</b>	<b>5.42</b>	<b>50.38</b>	<b>41.33</b>	<b>2.24</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>Yes/No</b>	<b>No/No</b>	<b>--</b>
<b>Phase III</b>				
Site Preparation	1.18	6.41	0.68	0.52
Irrigation System Installation	2.46	17.52	1.44	1.01
Planting	1.24	6.98	0.72	0.50
Maintenance & Monitoring	1.09	5.82	0.53	0.46
<b>Maximum Daily Emissions:</b>	<b>2.46</b>	<b>17.52</b>	<b>1.44</b>	<b>1.01</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>No/No</b>	<b>No/No</b>	<b>--</b>
<p><i>Based on CalEEMod computer modeling. Refer to Appendix A for modeling results and assumptions.            Activities within each phase are anticipated to occur sequentially.  <b>Level B:</b> Projects which exceed Level B thresholds should select as many best available mitigation measures (BAMM), in addition to the recommended list of standard mitigation measures.  <b>Level C:</b> Projects which exceed the Level C thresholds would be considered to have a significant impact.</i></p>				



**Table 4  
 Construction-Generated Emissions (Unmitigated) - Winter Conditions**

Construction Phase/Activity	Maximum Daily Emissions (lbs/day) <sup>1</sup>			
	ROG	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Phase I</b>				
Mobilization	0.16	1.92	0.34	0.07
Site Preparation/Grading	7.06	55.06	2.54	2.18
Excavation/Fill	4.71	39.52	8.03	1.79
Quarry Stone Installation	14.06	162.48	174.63	6.85
Soil Filled Quarry Stone Installation	13.80	159.07	79.26	6.72
Backfill/Soil Cover	12.42	141.33	63.53	5.99
<b>Maximum Daily Emissions:</b>	<b>14.06</b>	<b>162.48</b>	<b>174.63</b>	<b>6.85</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>Yes/Yes</b>	<b>Yes/Yes</b>	<b>--</b>
<b>Phase II</b>				
Mobilization	0.16	1.92	0.25	0.07
Site Preparation	5.42	40.13	2.71	1.87
Rock Removal	4.47	39.04	41.34	1.91
Excavation	3.89	36.14	11.43	1.57
Quarry Stone Installation	5.20	51.19	24.10	2.24
Soil Cover	3.51	26.43	1.40	1.17
<b>Maximum Daily Emissions:</b>	<b>5.42</b>	<b>51.19</b>	<b>41.34</b>	<b>2.24</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>Yes/No</b>	<b>No/No</b>	<b>--</b>
<b>Phase III</b>				
Site Preparation	1.18	6.42	0.68	0.52
Irrigation System Installation	2.47	16.56	1.44	1.01
Planting	1.25	7.02	0.72	0.50
Maintenance & Monitoring	1.09	5.83	0.53	0.46
<b>Maximum Daily Emissions:</b>	<b>2.47</b>	<b>16.56</b>	<b>1.44</b>	<b>1.01</b>
<b>Level B/C Thresholds:</b>	<b>25/137</b>	<b>25/137</b>	<b>80/137</b>	<b>None</b>
<b>Exceeds Level B/C Thresholds?</b>	<b>No/No</b>	<b>No/No</b>	<b>No/No</b>	<b>--</b>
<p><i>Based on CalEEMod computer modeling. Refer to Appendix A for modeling results and assumptions.            Activities within each phase are anticipated to occur sequentially. Totals may not sum due to rounding.  <b>Level B:</b> Projects which exceed Level B thresholds should select as many best available mitigation measures (BAMM), in addition to the recommended list of standard mitigation measures.  <b>Level C:</b> Projects which exceed the Level C thresholds would be considered to have a significant impact.</i></p>				



Implementation of construction activities during each of the proposed phases are anticipated to occur sequentially. However, some overlap of construction activities could potentially occur, particularly during Phase III, or prior to completion of the preceding phase, such as mobilization of subsequent phases. However, maximum daily emissions associated with these activities would not be anticipated to exceed the maximum daily emissions anticipated to occur during Phase I, as discussed above. Because emissions of  $\text{NO}_x$  and  $\text{PM}_{10}$  exceed the BCAQMD's significance thresholds, this impact would be considered ***potentially significant***.

### **Mitigation Measures**

#### **AQ-1: Construction-Generated Emissions**

The construction contractor will be responsible for preparing and implementing a fugitive dust and emissions reduction plan to limit fugitive dust, particulate matter, and GHG emissions. The plan will identify measures to be implemented during construction activities and will be reviewed and approved by the local air districts, the Service, and PCGID-PID. The Service and PCGID-PID will be responsible for ensuring the contractor implements the measures during construction activities. Applicable measures will also be implemented during longer term maintenance activities, as appropriate. Measures identified in the plan may include, but are not limited to, the following from the Butte County Air Quality Handbook (Butte County Air Quality Management District 2008):

- a. A water truck will be on-site at all times. Water will be applied to disturbed areas a minimum of two times per day or more as necessary, and all visibly dry disturbed areas and unpaved roads will be watered to minimize dust emission.
- b. Soil pile surfaces will be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic, or other material may be required to further reduce dust emissions.
- c. Water will be applied by means of truck(s), hoses, and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission.
- d. Unpaved roads may be graveled to reduce dust emissions at the discretion of the Service.
- e. Haul roads will be sprayed down at the end of the work shift to form a thin crust. This application of water will be in addition to the minimum rate of application.
- f. Haul vehicles transporting soil into or out of the property will be covered pursuant to California Vehicle Code Section 23114.
- g. On-site vehicles will be limited to a speed that minimizes dust emissions on unpaved roads.
- h. Vehicles entering or exiting the construction area will travel at a speed that minimizes dust emissions.
- i. Construction workers will park in designated parking area(s) to help reduce dust emissions.
- j. A publicly visible sign with the telephone number and person to contact regarding dust complaints will be posted in a publicly accessible area near the project area.



(such as along SR 45). This person will respond to complaints and take corrective action within 24 hours. The telephone number of the Butte and Glenn County air districts will also be visible.

- k. Unnecessary vehicle idling will be limited to 5 minutes.
- l. All construction equipment will be maintained in proper tune according to manufacturer's specifications.
- m. Offroad construction equipment shall meet Tier 3, or newer, certification standards for off-road heavy-duty diesel engines.
- n. To the extent available, offroad heavy-duty diesel-fueled construction equipment shall be fitted with ARB-verified diesel-exhaust control devices (e.g., diesel particulate filters), in accordance with manufacturer recommendations.
- o. Onroad heavy-duty haul trucks shall be model year 2000, or newer, or shall meet equivalent model year emissions standards.
- p. All construction equipment will be electrified if feasible, and gasoline-powered equipment will be substituted for diesel-powered equipment where feasible, unless alternatively fueled construction equipment can be used.

**Significance after Mitigation**

With implementation of the above mitigation measures maximum daily emissions would be reduced to below BCAQMD's Level C significance thresholds. Maximum daily emissions, with mitigation, are summarized in **Table 5**.

**Table 5  
 Short-term Construction-Generated Emissions (Mitigated)**

Construction Phase/Activity	Maximum Daily Emissions (lbs/day) <sup>1</sup>			
	ROG	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Phase I	12.10	101.86	120.98	4.91
Phase II	4.38	32.66	29.99	1.80
Phase III	3.65	12.60	1.35	0.93

*Assumes implementation of fugitive dust control measures, offroad equipment meeting Tier 3, or newer, emissions standards, and use of 2007, or newer, onroad haul trucks, or equivalent.*



## GREENHOUSE GASES AND CLIMATE CHANGE

### REGULATORY FRAMEWORK

#### FEDERAL

International and federal legislation has been enacted to deal with global climate change issues. The Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol governs compounds that deplete ozone in the stratosphere, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform. The Protocol provided that these compounds were to be phased out by 2000 (2005 for methyl chloroform).

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess "the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation."

On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change. Under the Convention, governments do the following: gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

A particularly notable result of the United Nations Framework Convention on Climate Change efforts was a treaty known as the Kyoto Protocol. When countries sign the treaty, they demonstrate their commitment to reduce their emissions of greenhouse gases or engage in emissions trading. More than 160 countries, representing 55 percent of global emissions—are currently participating in the protocol. In 1998, United States Vice President Al Gore symbolically signed the Protocol; however, in order for the Protocol to be formally ratified, it must be ratified by the United States Senate. The Senate has not ratified the Protocol and, furthermore, in anticipation of the Protocol, approved a nonbonding "Sense of the Senate" resolution in July 1997 by a margin of 95-0 that expressed opposition to the treaty's provisions, most notably the disparity in greenhouse gas emissions reduction obligations between industrialized nations and developing nations. In 2001, President George W. Bush indicated that he would not submit the treaty for ratification, which effectively tabled the Protocol indefinitely.

In October 1993, President Bill Clinton announced his Climate Change Action Plan, which had a goal to return greenhouse gas emissions to 1990 levels by the year 2000. This was to be accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in greenhouse gas emissions.

Massachusetts v. US EPA (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that the US EPA regulate four



greenhouse gases, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act. A decision was made on April 2, 2007, in which the Court held that petitioners have a standing to challenge the US EPA and that the US EPA has statutory authority to regulate emissions of greenhouse gases from new motor vehicles.

STATE

Senate Bill 1771 - Greenhouse Gas Emission Reductions: Climate Change

Senate Bill 1771, chaptered in September of 2000, specified the creation of the non-profit organization, the California Climate Action Registry. The Registry helps various California entities establish greenhouse gas (GHG) emissions baselines. Also, the Registry enables participating entities to voluntarily record their annual GHG emissions inventories.

A.B. 1493 – Reduction of GHGs from Passenger Vehicles/Light Duty Trucks

California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light-duty trucks. Regulations adopted by the CARB would apply to 2009 and later model year vehicles. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Executive Order No. S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following greenhouse gas emission reduction targets:

1. By 2010, reduce greenhouse gas emissions to 2000 levels;
2. By 2020, reduce greenhouse gas emissions to 1990 levels; and
3. By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the California Environmental Protection Agency (CalEPA) to lead a Climate Action Team made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The Climate Action Team's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

Assembly Bill 32 - California Global Warming Solutions Act of 2006

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes a cap on statewide greenhouse gas emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emissions levels. AB 32 charges the CARB, the state agency charged with regulating statewide air quality, with implementation of the act. The regulatory steps laid out in AB 32 require CARB to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping



plan to identify how best to reach the 2020 limit. The reduction measures to meet the 2020 target are to be adopted by the start of 2011.

The Board identified nine discrete early action measures including regulations affecting landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations and other sources in 2007 that included ship electrification at ports and reduction of high global warming potential (GWP) gases in consumer products. Regulatory development for the remaining measures is ongoing. In December 2007, the Board adopted a regulation requiring the largest industrial sources to report and verify their greenhouse gas emissions. The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels. In February 2008, the Board approved a policy statement encouraging voluntary early actions and establishing a procedure for project proponents to submit quantification methods to be evaluated by CARB. CARB, along with California's local air districts and the California Climate Action Registry (CCAR), is working to implement this program. In December 2008, a Scoping Plan was approved by CARB, which provides the outline for actions to reduce greenhouse gases in California (CARB 2008).

#### Senate Bill 97 - CEQA: Greenhouse Gas Emissions

Senate Bill 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Resources Agency is required to certify or adopt those guidelines by January 1, 2010. This bill also protected projects until January 1, 2010 that were funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E) from claims of inadequate analysis of GHG as a legitimate cause of action. Thus, this "protection" is highly limited to a handful of projects and for a short time period (CAPCOA 2008).

#### Governor's Office of Planning and Research

The Governor's Office of Planning and Research (OPR) published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to "...recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify GHG emissions
- Determine significance
- Mitigate impacts

#### Executive Order S-01-07

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's



transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

## METHODOLOGY

Short-term construction emissions associated with the proposed project were calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1. Emissions were quantified based on the estimated duration of construction activities, equipment use, and vehicle trips provided by the project engineer. GHG emissions were quantified for each of the major construction phases. Maximum annual emissions were quantified assuming that all construction activities would occur sequentially. Modeling assumptions and output files are included in **Appendix A** of this report.

## THRESHOLDS OF SIGNIFICANCE

CEQA Guidelines Amendments became effective March 18, 2010. Included in the Amendments are revisions to the Appendix G Initial Study Checklist that address GHG emissions. In accordance with these Amendments, a project would be considered to have a significant impact to climate change if it would:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or,
- b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Neither the BCAQMD nor the GCAPCD have adopted recommended significance thresholds for evaluation of greenhouse gas emissions.

## CONSTRUCTION-GENERATED EMISSIONS: PREFERRED ALTERNATIVE (ALTERNATIVE 4)

Based on the modeling conducted maximum annual GHG emissions associated with construction of the proposed project would total approximately 913 MTCO<sub>2e</sub>. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. With implementation of the proposed mitigation measures maximum annual GHG emissions would total approximately 873 MTCO<sub>2e</sub>. GHG emissions are summarized in **Table 6**. The BCAQMD and GCAPCD recommend implementation of available control measures to reduce short-term emissions of GHGs. Without implementation of available control measures, this impact would be considered potentially significant.

### **Mitigation Measures**

**MM GHG-1:** The following measures shall be implemented to reduce GHG emissions:

- a. To the extent feasible, reuse and/or recycle a minimum of 50 percent of construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).
- b. To the extent feasible, water-efficient irrigation systems should be used.
- c. Implement Mitigation Measure AQ-1,k-p.



**Table 6  
 Operational GHG Emissions (Unmitigated)**

Source	Annual Emissions (MTCO <sub>2e</sub> /year)	
	2013	2014
<b>Without Mitigation</b>		
Phase I	591.9	0
Phase II	241.1	0
Phase III	80.5	2.7
<b>Maximum Annual Emissions:</b>	<b>913.4</b>	<b>2.7</b>
<b>With Mitigation</b>		
Phase I	559.0	0
Phase II	233.3	0
Phase III	80.5	2.5
<b>Maximum Annual Emissions:</b>	<b>872.8</b>	<b>2.5</b>

*Based on CalEEMod computer modeling. Refer to Appendix A for modeling results and assumptions.*

## ALTERNATIVES EVALUATION

### ALTERNATIVE 1 : NO ACTION ALTERNATIVE

Alternative 1 entails continuation of current maintenance and management practices for the existing revetment along the Sacramento River and on the Riparian Sanctuary. The State (Department of Water Resources) would coordinate with the Corps on any maintenance required on the existing revetment. PCGID-PID would continue to maintain their pumping plant and fish screen facility as they have in the past. The Service would continue to implement weed control practices on the Riparian Sanctuary and rely on natural recruitment for restoration. No construction-generated emissions would be generated under this alternative.

### ALTERNATIVE 2: SPUR DIKES AND SITE-SPECIFIC PLANTINGS

Alternative 2 includes construction of spur dikes along the northwest bank of the Riparian Sanctuary and site-specific plantings across 400 acres of the Riparian Sanctuary. Eight rock spur dikes would be installed along approximately 2,000 feet of the river and would extend 75 feet out from the bank, primarily along an existing gravel bar that is exposed at low water levels just off the natural bank. The dikes would require approximately 12,160 total tons of riprap. In comparison to the preferred alternative, this alternative would require less importation of material. As a result, construction-generated emissions attributable to this alternative would likely be slightly less.



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### ALTERNATIVE 3: TRADITIONAL RIPRAP AND SITE-SPECIFIC PLANTINGS

Alternative 3 includes construction of traditional riprap with or without a low berm along the northwest bank of the Riparian Sanctuary and site-specific plantings as described for Alternative 2. The traditional riprap with a low berm would extend approximately 2,700 feet along the bank and 150 feet out from the bank, with some of the riprap extending beyond the gravel bar into the river. Approximately 44,400 tons of quarry stone and 24,750 tons of soil-filled quarry stone would be required for the riprap with berm. Approximately 89,100 tons of material would be excavated for the toe trench (in lieu of a low berm), and the riprap and backfill would require approximately 36,000 tons of quarry stone and 20,000 tons of soil-filled quarry stone. In comparison to the preferred alternative, this alternative would require the importation of more construction materials. As a result, construction-generated emissions attributable to this alternative would likely be higher.



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## REFERENCES

- Butte County Air Quality Management District (BCAQMD). January 2008. *CEQA Air Quality Handbook, Guidelines for Assessing Air Quality Impacts for Projects Subject to CEQA Review*. Available at website url: <http://www.bcaqmd.org/page/files/CEQA-Handbook-and-Appxs-08.pdf>.
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