EXECUTIVE SUMMARY

ES.1 Introduction

The Contra Costa Water District (CCWD) and the U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation) have prepared this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to evaluate the potential environmental effects of the Los Vaqueros Reservoir Expansion Project (reservoir expansion project) in accordance with the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CCWD is the lead agency under CEQA and Reclamation is the lead agency under NEPA. The Draft EIS/EIR provides information about the project alternatives and the potential direct, indirect, and cumulative environmental effects of the project alternatives. Federal decision making will be based on information in the Federal Feasibility Report, currently under development, in addition to the information in this document.

The San Francisco Bay/Sacramento–San Joaquin Delta Estuary is the largest estuary on the West Coast and provides essential habitat for a diverse array of fish and wildlife. It is also the critical hub in the conveyance of drinking water supplies to more than two-thirds of the California population and irrigation supplies to seven million acres of agricultural lands.

In response to worsening ecological conditions and increasing risk to water supplies, the Governor of California has assembled a task force to develop "a durable vision for sustainable management of the Delta" with the goal of "…managing the Delta over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well-being of the people of the state." The first recommendation in the task force report states that: "Delta ecosystem and a reliable water supply for California are the primary, co-equal goals for sustainable management of the Delta" (Delta Vision Blue Ribbon Task Force, 2007). This state-initiated planning process, known as Delta Vision, builds and expands upon the work of the CALFED Bay-Delta Program (CALFED), which included twelve program areas including ecosystem restoration, water supply reliability, water quality, storage, conveyance and the Environmental Water Account (EWA). Expansion of the existing Los Vaqueros Reservoir (the reservoir), owned and operated by CCWD, is one of five surface water storage projects identified for further investigation by CALFED.

The Los Vaqueros Reservoir is an off-stream storage reservoir near the Delta. CCWD currently pumps water from the Delta through state-of-the-art fish screens into this 100-thousand acre-foot (TAF) capacity reservoir. Having this storage capacity allows CCWD to improve the water

quality delivered to its customers and to adjust the timing of its Delta water diversions to accommodate the life cycles of Delta aquatic species, thus reducing species impact and providing a net benefit to the Delta environment.

Expanding the reservoir and related facilities presents an opportunity to expand these benefits, furthering the goals of Delta Vision and CALFED through a cooperative effort among CCWD and project participants, and through coordinated operations with the California Department of Water Resources' (DWR) State Water Project (SWP) and Reclamation's Central Valley Project (CVP). Through the use of the expanded reservoir and existing, new, and expanded facilities, substantial new benefits can be generated for fishery protection, environmental water management, and Bay Area water supply reliability.

This Draft EIS/EIR evaluates four alternatives for expanding the reservoir; three alternatives would increase the capacity to 275 TAF; the fourth would increase capacity to 160 TAF. Under the largest two alternatives studied, CCWD would expand the existing reservoir and add a new South Bay Connection to use the Los Vaqueros system to provide water to South Bay water agencies – Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7), Alameda County Water District (ACWD), and Santa Clara Valley Water District (SCVWD) – that otherwise would receive all of their Delta supplies through the existing SWP and CVP export pumps. The new and expanded facilities would be operated in coordination with Reclamation and DWR to shift Delta pumping for the three South Bay water agencies from the CVP and SWP Delta export pumps to the expanded Los Vaqueros reservoir system. The expanded storage coupled with shifting the pumping location to state-of-the-art fish screens would provide substantial benefits of protecting fish and reducing fish losses, developing and storing environmental water supplies, and improving Bay Area water supply reliability.

Studies of the reservoir expansion project began in 2001, managed by CCWD and supported and funded by Reclamation and DWR. Following preliminary planning studies that demonstrated the expansion project could result in environmental, water supply reliability and water quality benefits, voters in CCWD's service area were asked whether CCWD should consider expansion of its reservoir. The 2004 advisory ballot measure won approval of 62 percent of the voters. Since the vote, the proposed expansion project has been further developed and refined through detailed studies and extensive public outreach.

This Draft EIS/EIR describes the objectives, purpose and need, alternatives, benefits, and effects of the proposed reservoir expansion project. Four action alternatives that present different combinations of facility and water delivery options for expanding Los Vaqueros Reservoir and the No Project/No Action Alternative are evaluated. The emphasis of this document and the underlying analysis is on evaluating a range of alternatives to fully characterize the potential environmental effects and identify appropriate mitigation measures. Brief summaries of the potential environmental water management, water supply reliability, and water quality benefits that the project alternatives would provide are also included in this Executive Summary.

ES.1.1 Project Objectives

The Los Vaqueros Reservoir Expansion Project objectives are to use an expanded Los Vaqueros Reservoir system to:

Primary Objectives:

- Develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs.

- Increase water supply reliability for water providers within the San Francisco Bay Area, to help meet municipal and industrial water demands during drought periods and emergencies or to address shortages due to regulatory and environmental restrictions.

Secondary Objective:

- Improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area, without impairing the project's ability to meet the environmental and water supply reliability objectives stated above.

ES.1.2 Project Purpose and Need

The project purpose is to use an expanded Los Vaqueros Reservoir system to develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs in the Delta and tributary river systems, and to improve water supply reliability for urban users in the San Francisco Bay Area.

The need for this project is driven by the following conditions:

- The Delta ecosystem is in a state of serious decline, with primary productivity very low and fish populations decreasing to record low levels, putting at least one species (the delta smelt) on the brink of extinction.

- Insufficient quantities of water and lack of storage and flexibility in managing the timing and location of diversions for environmental and municipal water supplies are contributing to the ecosystem's decline.

- Ecosystem decline has put other beneficial uses of water supplies conveyed through the Delta at risk, leading to court-ordered limits on Delta pumping and greatly reducing water supply reliability for millions of people.

Improved storage and conveyance of environmental water supplies can help improve the Delta ecosystem conditions and reduce conflict among beneficial uses of Delta water supplies.

ES.2 Project Background

The Sacramento–San Joaquin Delta is an area of transition between the freshwater runoff from the Sacramento and San Joaquin Rivers and the tidally driven saltwater flows from the Pacific Ocean and San Francisco Bay. The Delta serves as habitat for a rich ecosystem of aquatic, terrestrial, and avian species, including more than 30 species protected under federal and state

regulations. The aquatic habitat supports anadromous fish such as chinook salmon and steelhead trout that pass through the Delta on their way to the ocean and back to upstream rivers to spawn, as well as many resident species such as delta smelt that live their entire lives in the Delta. All these species are susceptible to flow and water quality conditions in the Delta. The Delta also supports an extensive sport and commercial fishery.

The Delta is also critical to California's economy, supplying drinking water for more than two-thirds of Californians and irrigation water for 7 million acres of highly productive agricultural land. The Delta is also a key component of California's two largest water distribution systems: the CVP, operated by Reclamation, and the SWP, operated by DWR. Both the federal and state systems pump water out of the southwestern Delta to agricultural and urban contractors in the Bay Area and in central and southern regions of the state.

ES.2.1 Delta Challenges

The following critical elements of the Delta crisis are closely related to the project purpose, objectives, and need for the reservoir expansion project.

Declining Delta Ecosystem. Annual monitoring of fish abundance since 2000 includes record lows of delta smelt and young striped bass, and near-record lows of longfin smelt and threadfin shad (Resources Agency, 2007). Many factors have been cited for the decline of the Delta ecosystem generally, and for fish species in particular[1]. On December 14, 2007, U.S. District Court Judge Oliver Wanger issued an Interim Order curtailing water exports from the Delta to protect delta smelt (Delta Export Restrictions) until a new biological opinion is issued by the U.S. Fish and Wildlife Service (USFWS) (NRDC, et al., 2007).

Insufficient Water Supply for Environmental Purposes. The Central Valley Project Improvement Act (CVPIA, Public Law 102-575) was enacted in 1992 to "protect, restore, and enhance fish, wildlife and associated habitats in the Central Valley and Trinity River basins of California" as well as to improve the operations flexibility of the CVP. It contains numerous requirements to modify CVP operations and acquire water to protect and restore fisheries, Central Valley wildlife refuges, and other habitats and species. Reclamation has not been able to consistently provide the water needed to achieve the CVPIA goals. For example, Reclamation has been able to secure some, but not all, of the supplemental refuge water supply for these wetland habitat areas (Reclamation, 2006). Constraints in meeting the CVPIA targets include cost and availability of water, pumping capacity, storage and conveyance infrastructure.

Lack of Management Flexibility. The existing federal and state water systems lack flexibility in terms of when, where, and how water is pumped from the Delta. This lack of flexibility adds to the difficulty of addressing fish impacts, ecosystem decline, and supply reliability problems.

[1] Invasive species; low primary productivity (phytoplankton); increasing temperatures; reduced and altered timing of inflows to the Delta; increased and altered timing of exports from the Delta; declining water quality due to increased discharges from wastewater treatment plants, agricultural drains, industrial operations, and non-point sources; changes in physical and chemical parameters such as flow and salinity; and loss of wetlands and floodplains to urbanization and agricultural land conversion (Healey, 2007 and Baxter, et al., 2008).

CALFED's EWA Program is an example of an environmental water program aimed at protecting Delta fish species by increasing flexibility in SWP and CVP operations. The EWA has operated since 2001 to provide water "to augment streamflows, Delta outflows, to modify exports to provide fishery benefits and to replace the regular project water supply interrupted by the changes to project operations" (CALFED, 2000). A 2007 CALFED evaluation of the existing EWA Program found that the lack of storage for EWA water assets south of the Delta is a serious constraint on EWA management and affects the ability to make the best use of the water for environmental purposes (CALFED, 2007).

Decreasing Supply Reliability. Bay Area water agencies rely heavily on water supplies conveyed through the Delta to meet their normal year demands and prepare them for drought periods. CCWD customers receive almost 90 percent of their supply from the Delta. The three South Bay water agencies that receive SWP water - ACWD, SCVWD and Zone 7 - each receive 40 to 65 percent of their supply from the Delta (ACWD, 2005; SCVWD, 2005; Zone 7, 2005). Delta water supply reliability can be adversely affected by both dry year conditions and regulatory actions to protect Delta fish that constrain Delta pumping. Meeting the flow requirements in the federal-court issued Delta Export Restrictions to protect delta smelt has necessitated CVP and SWP Delta export pumping curtailments that reduce the reliability of water supplies delivered to urban and agricultural water users dependent on these pumps. For example, in February 2008, DWR notified SWP contractors that they would receive just 35 percent of their requested supplies in 2008, which is significantly less than the 60 percent of requested supplies initially projected for calendar year 2008. Catastrophic emergency events such as earthquakes, chemical spills, or levee failures also could affect the Delta and the delivery of Delta water supplies.

Declining Drinking Water Quality. Delta water quality for drinking water supplies has generally declined because of saltwater intrusion resulting from water resources management actions; polluted runoff from urban, agricultural, and other land development; and changes in the physical environment. Seasonal variations as well as longer-term degradation of Delta water quality result in elevated salinity, total dissolved solids, bromide, total organic carbon, and algae concentrations, and high levels of hardness and turbidity, which can affect treatment cost and effectiveness, taste and odor, and health considerations.

ES.2.2 Planning Process and Potential Participants

Since 1995, federal, state, and local agencies and stakeholders have been exploring water storage as one of the potential solutions to numerous water resource challenges in the Bay-Delta system. The CALFED Record of Decision (ROD) includes the expansion of Los Vaqueros Reservoir as one of five water storage projects identified for further investigation as part of the CALFED Storage Program. CALFED also identified the need to provide environmental water in the Delta and its tributaries to improve fish habitat and protection, particularly related to the impacts of pumping at the SWP and CVP Delta export facilities.

Los Vaqueros Reservoir Expansion Planning

The planning phase of the Los Vaqueros Reservoir Expansion Project began in January 2001. Since 2001, extensive public outreach has been conducted and numerous studies of the reservoir expansion project have been completed to identify project alternatives, evaluate project benefits and costs, and assess potential environmental effects. These studies have been documented in the following project reports, which are available on the project web site at www.lvstudies.com (Reclamation, 2006; Reclamation; 2005; CCWD, 2004; CCWD, 2002).

- Initial Economic Evaluation for Plan Formulation Report, July 2006
- Initial Alternatives Information Report, September 2005
- Final Draft Planning Report, April 2004
- Project Concept Report, August 2002

Other studies are in progress to develop more detailed information on the potential project benefits and costs, and the allocation of costs to potential project beneficiaries, and project participants. Such efforts will result in reports to support federal and state decision making.

- Federal Feasibility Report
- State Feasibility Report

Potential Project Participants and Interests

Since 2001, CCWD and Reclamation have worked with DWR and other potential project beneficiaries to develop and refine the alternatives to meet project objectives while minimizing or avoiding impacts and causing no harm to other water users. Alternatives development has been guided by the following interests and principles:

Federal – The potential federal interest in the reservoir expansion project includes the protection and restoration of Delta fisheries, water supplies for environmental purposes, including fisheries and wetland habitat, and the reliability of Bay Area CVP contract supplies. The type and extent of federal interest will be determined by the appropriate decision makers based on the separate Federal Feasibility Report and other pertinent information.

State – The potential state interest in the reservoir expansion project includes the protection and restoration of Delta fisheries, water supplies for environmental purposes, and the reliability and quality of Bay Area SWP contract supplies. The type and extent of state interest will be determined by the appropriate decision makers based on the separate State Feasibility Report and other pertinent information.

Regional and Local – Should they choose to participate, the three South Bay water agencies' interest in the reservoir expansion project includes the protection and restoration of Delta fisheries and the reliability and quality of South Bay water supplies. The greater Bay Area interest in the project includes the addition of local emergency storage.

CCWD – CCWD's interest in the reservoir expansion is to maintain and expand the water quality benefits of the reservoir for its customers, gain water supply reliability benefits, and coordinate reservoir operations with federal and/or state water operations to protect and restore Delta fisheries and provide other environmental benefits. CCWD Board of

Directors' Resolution No. 03-24 (June 25, 2003) provides further guidance for formulating alternatives for expanding the reservoir (see Sidebar). An advisory vote was held on March 2, 2004 and customers within CCWD's service area voted 62% in favor of reservoir expansion.

In Resolution No. 03-24 the CCWD Board determined "that the District will not participate in or support the CALFED Bay-Delta Program proposal for expansion of Los Vaqueros Reservoir unless the Board determines that the CALFED Bay-Delta Program proposal meets the following conditions:

1. Improves drinking water quality for CCWD customers beyond that available from the existing Los Vaqueros Project;
2. Improves the reliability of water supplies for CCWD customers during droughts;
3. Enhances Delta habitat and protects endangered Delta fisheries and aquatic resources by installing state-of-the-art fish screens on all new intakes and creating an environmental asset through improved location and timing of Delta diversions and storage of water for environmental purposes;
4. Increases the protected land and managed habitat for terrestrial species in the Los Vaqueros Watershed and the surrounding region;
5. Improves and increases fishing, boating, hiking, and educational opportunities in the Los Vaqueros Watershed, consistent with the protection of water quality and the preservation of the watershed and the watershed's unique features;
6. CCWD continues as owner and manager of the Los Vaqueros Watershed;
7. CCWD maintains control over recreation in the Los Vaqueros Watershed;
8. CCWD continues as operator of the Los Vaqueros Reservoir system;
9. CCWD will be reimbursed for the value of the existing Los Vaqueros Project assets shared, replaced, rendered unusable or lost with the expansion project and said reimbursement will be used to purchase additional drought supply and water quality benefits or reduce debt on the existing Los Vaqueros Project;
10. Water rates for CCWD customers will not increase as a result of the expansion project."

Other Related Planning Processes

There are several ongoing planning processes underway with the potential to affect the future of the Delta. These processes are intended to identify long-term programs and projects to restore a sustainable Delta. The expansion of Los Vaqueros Reservoir would contribute to creating a sustainable Delta and can be coordinated with these parallel planning processes.

Delta Vision and Strategic Plan. The Delta Vision and Strategic Plan were formulated by the Blue Ribbon Task Force appointed by Governor Schwarzenegger to develop a durable vision for sustainable management of the Delta. In December 2007, the Task Force released its report "Delta Vision: Our Vision for the California Delta" (Delta Vision Blue Ribbon Task Force, 2007). The Delta Vision Strategic Plan was completed in November 2008 (Delta Vision Blue Ribbon Task Force, 2008). The Strategic Plan concluded that the Delta must be managed according to two coequal goals: "Restore the Delta ecosystem and create a more reliable water supply for California". Then, at the end of 2008 the Delta Vision Committee submitted its final implementation plan to the Governor with recommended actions to manage the Delta to fulfill its coequal goals of water supply reliability and ecosystem restoration. The Delta Vision Committee Implementation Report sets priorities based on the Strategic Plan and was released to the public in January 2009 (Delta Vision Committee, 2008). Although consistent with recommendations in the Delta Vision (e.g., Recommendations 7, 8, and 9) and the Strategic Plan, the Los Vaqueros Reservoir Expansion Project is independent of this planning effort. Decisions on whether and how to proceed with any of the alternatives evaluated in this Draft EIS/EIR are not tied to implementation of the Delta Vision Strategic Plan.

Bay Delta Conservation Plan. The Bay Delta Conservation Plan (BDCP) is being developed consistent with section 7 and section 10 of the Federal Endangered Species Act, and either section 2835 or section 2081 of the State Fish and Game Code to result in the issuance of incidental take permits for covered activities. The covered activities would include, among others, operation of the CVP and SWP, facility improvements for the CVP and SWP, new Delta conveyance facilities, and habitat conservation measures included in the BDCP. The reservoir expansion project is not a covered activity in the BDCP; decisions on whether and how to proceed with any of the project alternatives evaluated in this Draft EIS/EIR are not tied to completion or implementation of the BDCP.

Operations Criteria and Plan. USFWS and the National Marine Fisheries Service (NMFS) have been required by federal court orders in *Pacific Coast Federation of Fishermen's Associations v. Gutierrez* (*PCFFA*, 2008) and *Natural Resources Defense Council, et al. v. Kempthorne* (*NRDC et al.*, 2007) to issue new biological opinions based on the 2008 Operations Criteria and Plan (OCAP) for operating the SWP and CVP. USFWS issued its biological opinion on December 15, 2008. NMFS is currently preparing its biological opinion with a target for completion by mid-summer 2009.

The analyses pertaining to operations of the SWP and CVP in this document are based on the Interim Order issued by Judge Wanger and the 2004 OCAP. Because NMFS has not yet issued its biological opinion, it is not yet possible to assess the changes to SWP and CVP operations that may occur due to the combined effects of the USFWS and NMFS biological opinions for the 2008 OCAP. Reclamation and DWR intend to complete an analysis of the effects that the new biological opinions will have on the operations of SWP and CVP. It is possible that the new opinions may result in moderate to severe fishery restrictions being imposed on Delta exports, depending on annual hydrologic conditions, above and beyond those caused by the Interim Order. The analysis of the effects of the new biological opinions on the operations of the SWP and CVP will be described in the Final Federal Feasibility Report and Final EIS/EIR for this project.

The 2008 OCAP biological opinions will cover the effects of the joint operations of the SWP and CVP on federally listed threatened and endangered species and their critical habitat and will not include operations of the Los Vaqueros Reservoir Expansion Project. The reservoir expansion project would be subject to its own biological opinions, which are expected to take into account the 2008 OCAP.

Agency Planning and Coordination

CCWD is the lead agency under CEQA and has been managing the reservoir expansion project studies with funding from both Reclamation and DWR. Reclamation is the lead agency under NEPA. Reclamation's involvement is authorized by Congress through Public Laws 108-7 and 108-361, which authorized Reclamation to undertake a feasibility study of expanding the reservoir and to pursue its development, along with other ongoing environmental and storage projects, in a balanced manner. DWR's interest in the reservoir expansion project started with the state's commitment to the CALFED Storage Program and continues based on recognized needs to

restore reliability to SWP contractors in the Bay Area while meeting CALFED goals of ecosystem restoration in the Delta.

These three agencies have coordinated project planning and the environmental review with the other potential project beneficiaries and regulatory agencies, which include the following agencies:

- The South Bay water agencies who receive contract supplies from the SWP and/or the CVP and would benefit from increased water supply reliability – ACWD, SCVWD, and Zone 7
- Federal and state natural resource management agencies, who along with Reclamation and DWR plan, manage, regulate, and acquire environmental water for fisheries and wildlife refuges – California Department of Fish and Game (CDFG), USFWS, and NMFS
- The Western Area Power Administration (Western), a federal agency that delivers hydroelectric power to the CVP and to CCWD's existing Los Vaqueros facilities

Several of the federal, state and local agencies described above have participated and provided input on the planning process through the Agency Coordination Work Group (ACWG). The interagency coordination process is described in the Memorandum of Understanding (Los Vaqueros MOU) among the agencies that was completed in April 2001 and extended through 2010 (DWR et al., 2001). In addition, Western formally agreed to participate in the environmental review as a federal cooperating agency as a result of its potential role approving power transmission facilities for the reservoir expansion project.

Evaluation of Potential Benefits

The evaluation of benefits described in this report is intended to provide information for potential project participants and to provide a basis for evaluating potential environmental impacts. If the lead agencies decide to pursue the project following this environmental analysis, additional analyses of the extent of these benefits will be necessary for potential project partners, including state and federal government agencies, to determine their level of interest and willingness to make a financial commitment to the proposed project.

Benefits referred to in this Draft EIS/EIR are not the same as benefits used to justify federal interest in a Federal Feasibility Report; rather benefits indicate than an effect is beneficial instead of detrimental to the environment.

ES.3 Description of Project Alternatives

The action alternatives evaluated in this Draft EIS/EIR involve an expansion of Los Vaqueros Reservoir to increase the flexibility of Delta operations serving CCWD and the South Bay water agencies (ACWD, SCVWD, and Zone 7) to improve Delta conditions for fish, provide additional environmental water for fish and/or wildlife refuges, and improve water supply reliability and water quality for Bay Area water agencies. The alternatives reflect a potential range of facility configurations and operations.

The No Action Alternative is required pursuant to NEPA (40 CFR 1502.14.d) and a No Project Alternative is required for CEQA compliance (CEQA Guidelines Sections 15125 and 15126.e). Hereafter called the No Project/No Action Alternative, this alternative assumes the existing and likely future conditions in the project area without implementation of any of the action alternatives. Under the No Project/No Action Alternative, it is assumed that the existing reservoir and conveyance system would remain in place, although operations may change. From the federal planning perspective, the No Action Alternative is the default choice unless federal involvement is demonstrated to be feasible, justified, and in the federal interest.

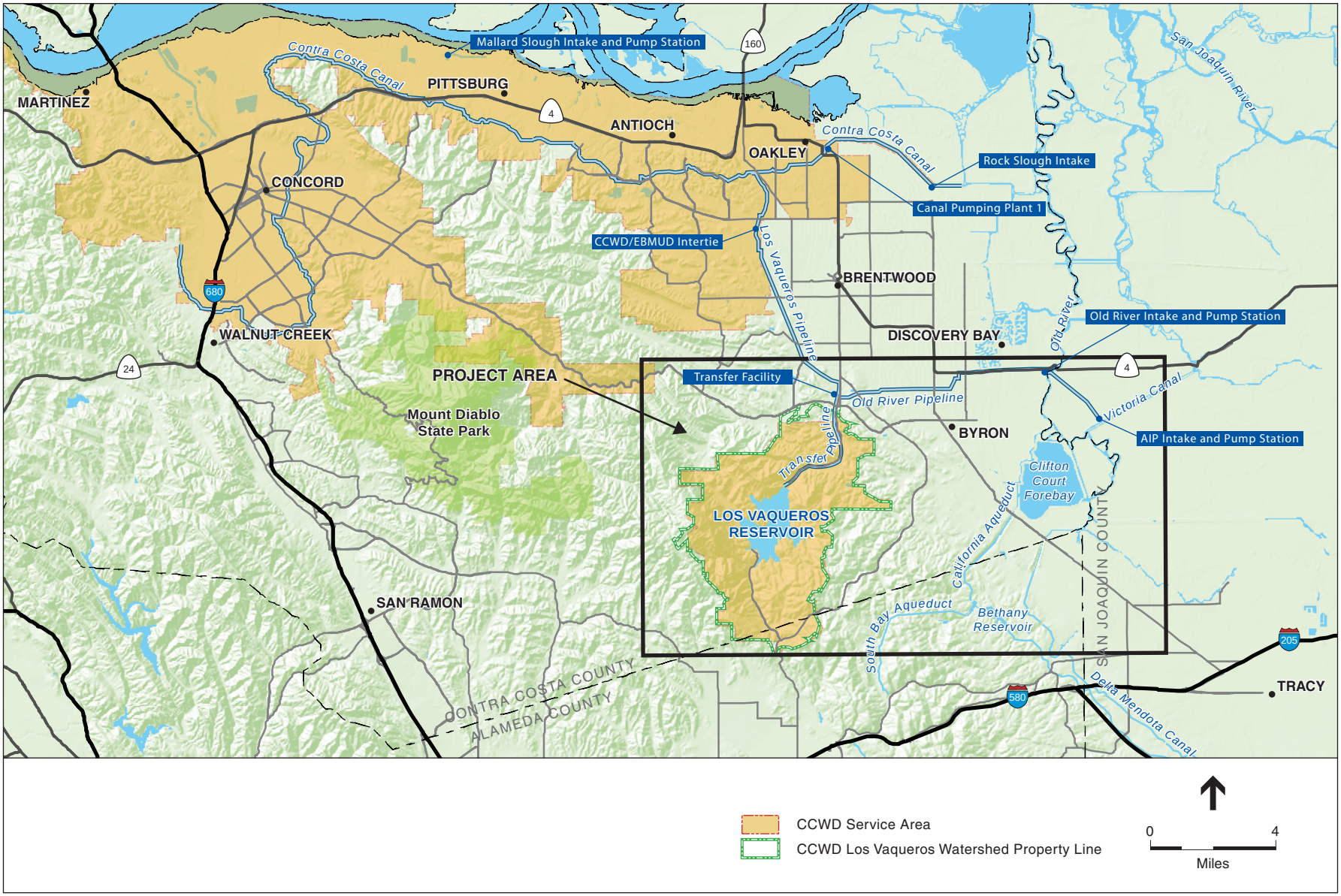
The four action alternatives described below could provide a combination of environmental water management, water supply reliability, and drinking water quality improvements, depending on the alternative selected and the final project participants. Alternative 1 is considered the Proposed Project for purposes of CEQA and it is treated as the Proposed Action for purposes of NEPA. Alternative 1 includes the largest reservoir expansion and greatest extent of associated facilities considered in this Draft EIS/EIR and is designed to meet both of the primary project objectives. At the other end of the range, Alternative 4 represents the smallest reservoir expansion with the fewest new or expanded facilities. At this stage of planning and evaluation, none of the alternatives has been designated as the Preferred Alternative under NEPA or the Least Environmentally Damaging Practicable Alternative (LEDPA) under Section 404(b)(1) of the federal Clean Water Act because related engineering, economic, and financial feasibility analyses are not yet complete.

Regardless of the alternative, the expanded reservoir system would create a new level of flexibility to respond to Delta conditions that change from season to season and year to year. The Draft EIS/EIR alternatives frame and analyze the range of potential operations and thus the range of potential impacts. Actual operations would fall within the range analyzed but would vary from the scenarios analyzed and would likely vary from year to year. The expanded reservoir could be managed to further optimize reservoir operations to maximize the benefits without causing adverse impacts beyond the range identified in this Draft EIS/EIR.

ES.3.1 Project Location

Los Vaqueros Reservoir lies in the foothills west of the Delta in Contra Costa County at the eastern edge of the Bay Area (**Figure ES-1**). It is an off-stream reservoir, meaning that it relies on water being pumped into it from another location (in this case, the Delta), rather than being located on a river and intercepting natural flows.

Los Vaqueros Reservoir is strategically located adjacent to the Delta and near state and federal water supply facilities including the South Bay Aqueduct (SBA), providing an opportunity to convey Delta water to the South Bay water agencies through the Los Vaqueros system rather than through the SWP and CVP Delta export pumps.



SOURCE: USGS, 1993 (base map); and ESA, 2008

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure ES-1

Project Area Location

ES.3.2 Overview of Alternatives

This Draft EIS/EIR evaluates four action alternatives that represent different combinations of facility and water system operations for expanding Los Vaqueros Reservoir and associated water conveyance. A No Project/No Action Alternative is also evaluated as required by CEQA and NEPA. As summarized below, Alternatives 1 and 2 include the largest reservoir expansion (to 275 TAF) and the South Bay Connection to serve the three South Bay water agencies (ACWD, SCVWD and Zone 7). Alternatives 1 and 2 differ in the operational emphasis between environmental water management and water supply reliability. Alternatives 3 and 4 have no South Bay Connection, and differ as to the size of the expanded reservoir (a 275 TAF versus a 160 TAF reservoir); Alternative 3 and 4 also differ in operational emphasis. Alternative 4 represents the smallest reservoir expansion with the fewest new or expanded facilities.

All four alternatives provide improvements and benefits for environmental water management, water supply reliability, and water quality to varying degrees in comparison to the No Project/No Action Alternative. The operational assumptions analyzed for the alternatives are intended to provide information about the changes in environmental impacts or project benefits that might result from both differing water management scenarios and differing facilities. Assumptions regarding operations were chosen to bracket a range of potential operations and associated impacts. The project benefits, on the other hand, could be greater than those identified in this Draft EIS/EIR because operation of any selected alternative could be adaptively managed to maximize project benefits without increasing adverse environmental effects.

The Los Vaqueros Reservoir Expansion Project is intended to provide a broad variety of benefits, including Delta fisheries protection and enhancement, Bay Area water supply reliability, and water quality improvement. The EIS/EIR's discussion of these benefits is necessarily based on facts and reasonable projections of future conditions available when the analysis was conducted. The extent of the benefits achieved in each of these areas will depend on several factors, including future Delta conveyance and habitat improvements, Delta operations requirements, and the project's precise environmental water management actions as further developed in project permits and agreements with project partners.

Several analyses were performed to evaluate the benefits and impacts of the Los Vaqueros Reservoir Expansion Project on Delta fisheries under a range of project operations, as described in Section 4.3 of the Draft EIS/EIR. Each of the methods used in the Draft EIS/EIR for evaluating fishery effects provides useful information, but each method also has limitations; the suite of methods were used together to develop a comprehensive understanding of project impacts and benefits. The analyses universally show that the project (Alternatives 1, 2 and 4) has no adverse impacts on fish, and provides a range of benefits for fish, including changing the timing of water diversions, improvement in flow conditions, temperature, or other benefits that contribute to restoration of aquatic ecosystems and native fish and wildlife. The actual level of benefits achieved would ultimately depend on the project alternative selected and its final permits, including federal and state endangered species act permits, and any other requirements under state or federal law.

Table ES-1 summarizes the key distinctions among the four action alternatives. The project alternatives could be constructed and in operation by 2014 if required approvals, authorizations, appropriations, and permits are obtained.

TABLE ES-1
RESERVOIR EXPANSION ALTERNATIVES
WITH KEY DISTINGUISHING CHARACTERISTICS

Project Characteristic	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Expanded Reservoir Storage Capacity	275 TAF	275 TAF	275 TAF	160 TAF
Operational Emphasis	Environmental Water/Benefits & Water Supply Reliability	Environmental Water/Benefits	Environmental Water/Benefits	Water Supply Reliability
New South Bay Connection?	Yes, 470 cfs	Yes, 470 cfs	No	No
Intake Facilities	Construct new 170 cfs intake facility on Old River	Construct new 170 cfs intake facility on Old River	Expand existing CCWD intake facilities by 70 cfs	No changes to existing intake facilities
Pipeline Capacity from Intake to Expanded Reservoir	Expand pipeline capacity from 320 cfs to 670 cfs	Expand pipeline capacity from 320 cfs to 670 cfs	Expand pipeline capacity from 320 cfs to 570 cfs	No changes to pipeline capacity

Project Facilities

Alternatives 1 and 2 include increasing the existing 100 TAF reservoir storage capacity to 275 TAF and a new South Bay Connection with a capacity of up to 470 cubic feet per second (cfs) to connect the expanded reservoir to the SBA facilities at Bethany Reservoir. Alternatives 3 and 4 do not include the South Bay Connection and Alternative 4 includes a smaller reservoir expansion to 160 TAF.

System Operations

Alternatives 1 and 2 would shift a major portion of the Delta supply diversion location and timing for the three South Bay water agencies from the SWP and CVP export pumps to the expanded Los Vaqueros system. When operated in coordination with the SWP and CVP systems, the expanded Los Vaqueros system's screened intakes and reservoir can provide substantial improvement and flexibility for fish protection, environmental water supplies, and Bay Area water supply reliability. Fish protection benefits result from improved fish screening through state-of-the-art fish screens, application of a no-diversion period during the most critical times for fish, multiple intake locations to avoid fish, and added flexibility in timing the pumping curtailment at SWP and CVP Delta export facilities to provide greater fish benefits.

Alternatives 1 and 2 vary the use of the expanded storage between environmental water management and supply and water supply reliability. Water supply reliability would be provided by restoring some Delta supplies lost due to current regulatory restrictions on SWP and CVP

export pumping, storing water in wet years for use in dry years, and increasing available storage for emergencies. Alternative 2 includes dedicated storage for environmental water supplies. Alternatives 1 and 2 also would provide incidental improvements in the water quality delivered to three South Bay water agencies by providing higher quality water from the reservoir instead of the Delta when salinity increases in the Delta and by reducing the amount of time that water is delivered through Clifton Court Forebay where warm, shallow, slow-moving water often results in algae growth and a resulting increase in organic carbon content and taste and odor issues. Additional storage also improves water quality for CCWD in dry years. Alternatives 3 and 4 would be operated to provide fish protection, environmental water supply, and water supply reliability benefits without the South Bay Connection. These two alternatives would also provide incidental water quality improvements.

Water Rights and Coordinated Operations

None of the alternatives would involve diverting more water from the Delta than allowed under existing water rights or changing the ownership or priority of those water rights. The project alternatives would change the timing and location of diversions such that fish protection, environmental water supplies, and Bay Area water supply reliability would improve. It is anticipated that existing water right permits held by CCWD, Reclamation, and/or DWR may need to be modified.

In addition to its long-term contract with Reclamation, CCWD has separate water rights for the Los Vaqueros Reservoir. CCWD's separate Los Vaqueros water rights are subject to permit terms and conditions to ensure they do not adversely affect the CVP and SWP operations under the water rights held by Reclamation and DWR, respectively. Under all these water system operations, the use of the collective water rights of the project participants would be coordinated to operate the existing and new facilities in a manner designed to accomplish the project objectives without adversely affecting CVP or SWP operations. This would be achieved through agreements among the parties and permit changes as necessary.

No Project/No Action Alternative

Under this alternative, CCWD and Reclamation would not implement the Los Vaqueros Reservoir Expansion Project. However, CCWD, Reclamation, and others potentially served by the project would proceed with other activities and projects to maintain, modify and/or expand their existing water systems in accordance with their respective plans and active project proposals. No environmental water management supplies would be provided, and existing diversions to the three South Bay water agencies would continue through the existing SWP and CVP export pumps as they do now. No additional water supply reliability or emergency supplies would be provided.

To maintain supply reliability to its customers, CCWD would implement actions identified in its Future Water Supply Study (CCWD, 1998), including acquisition of water transfers as needed to provide reliable dry-year water supply. CCWD would also operate its approved Alternative Intake Project (AIP; a new intake on Victoria Canal), which is currently under construction.

Under this alternative, no new South Bay Connection to the Bethany Reservoir would be constructed. The approved enlargement of the SBA, now in progress, would be completed but no other changes to the SBA conveyance system or operation are anticipated at this time. The No Project/No Action Alternative also does not include changes to SWP or CVP facilities. Other Bay Area water agencies would continue to operate under their current plans.

DWR and Reclamation are beginning studies on potential modifications to the existing water conveyance system through the Delta (DWR Notice of Preparation for Bay Delta Conservation Plan (BDCP) EIR/EIS, issued March 17, 2008) but no specific project(s) can yet be considered a likely part of the No Action/No Project future scenario. No other new projects sponsored by Reclamation on the CVP system are included in this alternative.

Alternative 1: Expanded 275-TAF Reservoir, South Bay Connection, Environmental Water Management and Water Supply Reliability Dual Emphasis

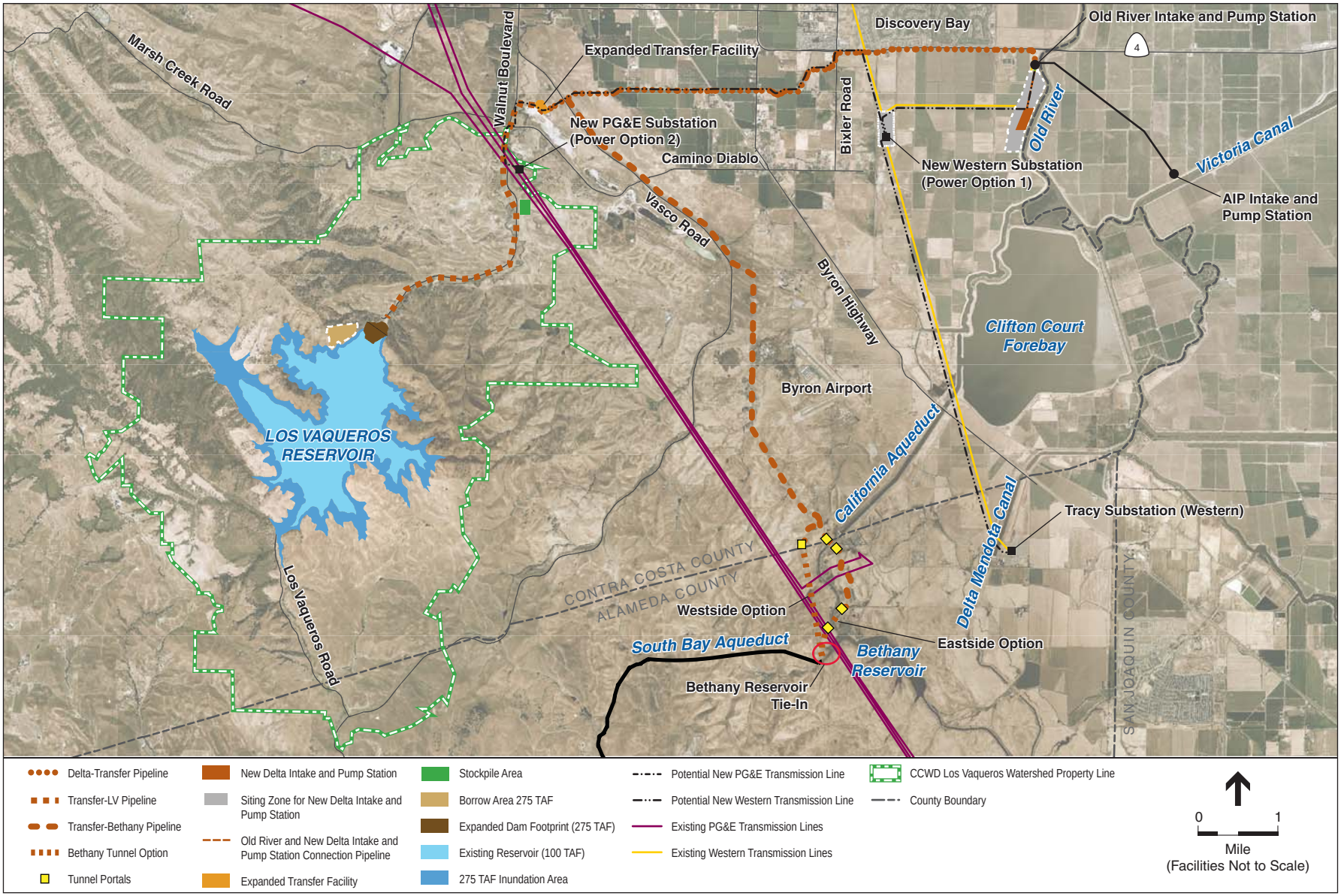
Key Features

- Expanded 275 TAF Reservoir
- Dual Emphasis on Environmental Water Management and Water Supply Reliability
- South Bay Connection of up to 470 cfs
- New Delta Intake Facility of up to 170 cfs
- Expanded Pipeline from Delta to Reservoir, to allow a total capacity of 670 cfs

Alternative 1 is designed to emphasize both of the primary objectives (environmental water management *and* water supply reliability improvement for the Bay Area) and include the largest number of potential beneficiaries of the reservoir expansion. This alternative would protect Delta fish through improved screening of diversions and coordinated operations with Reclamation's CVP system and DWR's SWP system. It would also include storage to improve water supply reliability and emergency water supplies for Bay Area water agencies. This alternative includes the largest proposed expansion of the reservoir, a new intake in the Delta, increased conveyance capacity from the Delta to the reservoir, and a South Bay Connection. Under Alternative 1, water would be moved through the expanded reservoir system into the SWP system at Bethany Reservoir, which serves all three South Bay water agencies (ACWD, and SCVWD, and Zone 7), and into San Luis Reservoir, which provides SCVWD its CVP contract water. **Figure ES-2** shows the existing and new facilities for Alternative 1.

Environmental Water Management

When operated in coordination with Reclamation's CVP system and DWR's SWP system, the expanded reservoir would be operated to divert and deliver a major portion of the South Bay water agencies' contracted state and federal system water through the expanded Los Vaqueros system and new South Bay Connection instead of through the existing SWP and CVP Delta export pumping facilities. These water system operations would improve Delta fish protection in the following ways:



SOURCE: USGS, 1993 (base map); and ESA, 2008

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Figure ES-2

Proposed Facilities – Alternatives 1 and 2

1. *Improved Fish Screening*. The expanded reservoir system would only divert water through state-of-the-art, positive barrier fish screens designed and operated to regulatory agency specifications. These fish screens would provide superior fish protection for the diversions to meet South Bay water agency needs. CVP and SWP Delta export pumping would be reduced to correspond with the use of the Los Vaqueros Reservoir pumping system for the South Bay water agencies. Shifting this water diversion to the more effectively screened Los Vaqueros Reservoir system intakes would have fewer impacts to fish than the same amount of water diverted from either the SWP or CVP export facilities. As analyzed in this EIS/EIR, this reduction takes place at the same time as the shift to Los Vaqueros Reservoir system intakes, but DWR, Reclamation and the state and federal fisheries agencies could optimize the timing of the reduction to further benefit fish. For example, the SWP and CVP Delta export pumps could be operated at minimal levels in April to improve salmon migration or to allow delta smelt larvae to move out of the South Delta, or they could be operated at minimal levels in February to allow longfin smelt larvae to move out of the South Delta. Initial estimates indicate that such operations could yield about 100 to 150 TAF of water per year to use in this manner.

2. *No-Diversion Period*. The additional storage also would provide operational flexibility to reduce or eliminate diversions into the expanded Los Vaqueros system during the most sensitive fish period without disrupting supplies. Current regulations for Los Vaqueros include a no-diversion period during the most critical spring fish period. During this period, water needs are met with stored water in Los Vaqueros Reservoir. Shifting the South Bay water agency diversion to the expanded Los Vaqueros system allows the application of this no-diversion period to approximately three times the current amount (existing CCWD diversions plus South Bay water agency diversions), while still making the water deliveries to the participating agencies.

3. *Multiple Delta Intake Locations*. Water would be diverted by the expanded Los Vaqueros system through three separate Delta intakes (Old River, AIP, and the new Delta Intake). Multiple points of diversion, coupled with additional storage capacity would enable coordination with CVP and SWP operations and pumping facilities to improve flexibility to respond to changing fishery conditions in the Delta to best protect fish.

Water Supply Reliability

The water delivery operations for Alternative 1 also provide three types of water supply reliability for Bay Area water agencies:

1. *Delta Supply Restoration*. Stored water supplies would be used to partially restore the delivery reductions to South Bay water agencies that have occurred and are expected to continue to occur due to regulatory restrictions at the SWP and CVP Delta export pumps. The state-of-the-art fish screen operations with multiple locations described above also could increase reliability for those agencies by making the deliveries less subject to the uncertainty associated with regulatory restrictions on the SWP and CVP Delta export pumps. With additional storage, demands can be met with releases from the reservoir even when Delta export diversions are curtailed to avoid sensitive fish periods and protect environmental resources.

2. *Dry Year Storage*. The additional storage would increase the amount of water available in dry years to South Bay water agencies and CCWD, reducing the need to purchase supplemental dry-year supplies.

3. *Emergency Storage*. Increased stored water supplies would be available for delivery to Bay Area water agencies through the South Bay Connection or existing interties in the event of a Delta levee failure or spill or other emergency.

Water Quality

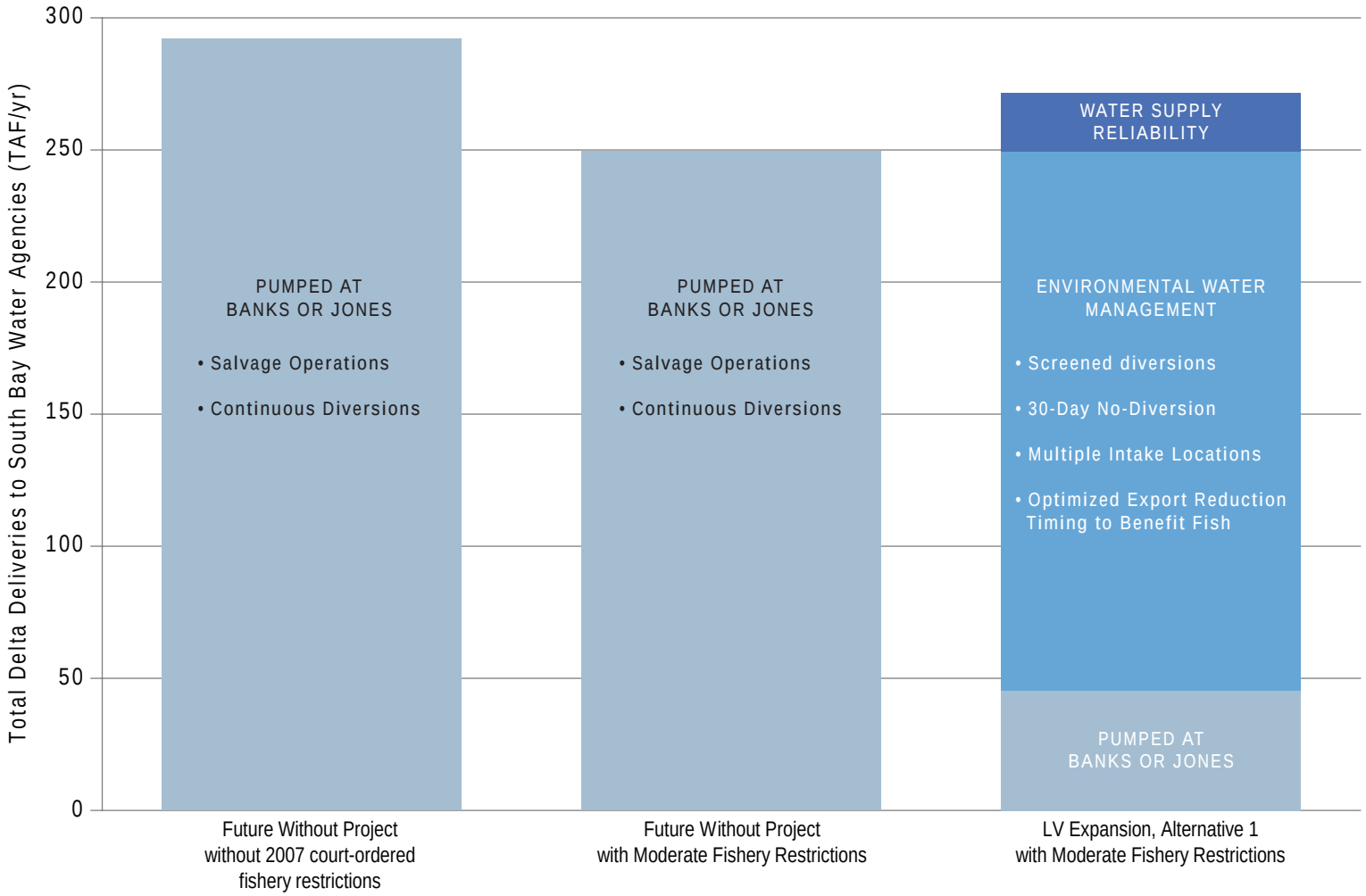
Alternative 1 would result in some water quality improvements with reduced salinity levels in dry periods and improvements in temperature and turbidity because a substantial portion of supplies to the SBA would no longer pass through Clifton Court Forebay. The expanded reservoir would also improve water quality for CCWD by providing a larger supply of high quality water stored in the reservoir to blend with Delta supplies in dry years.

Table ES-2 shows the potential improvements for environmental water management, Bay Area water supply reliability, and water quality for Alternative 1. **Figure ES-3** illustrates the environmental water management benefits and the water supply benefits for the South Bay water agencies graphically.

TABLE ES-2
ALTERNATIVE 1 – SUMMARY OF BENEFITS

Operations	Benefits[1]		
	Long-term Average Yield	6-Year Drought	
		Annual Average Yield	Total
Environmental Water Management[4]	205 TAF/year	135 TAF/year	820 TAF
South Bay Water Agencies Water Supply Reliability	20 TAF/year	30 TAF/year	170 TAF
CCWD Water Supply Reliability[2]	NA	3 TAF/year	20 TAF
Emergency Water Storage[3]	225 TAF	170 TAF	NA
Additional Real-time Operating Benefits	Multiple intake locations to further avoid fish impacts; increased water supply reliability by reducing regulatory pumping restrictions Timing of pumping reductions at SWP/CVP Delta export facilities to further benefit fish		
South Bay Water Agencies Water Quality	Incidental taste & odor improvements Incidental salinity improvements		
CCWD Water Quality	Incidental improvement in CCWD's ability to meet its delivered water quality goal		

1 Long-term average and 6-year drought values based on 2030 level of development, moderate fishery restrictions.
2 Assumes 20 TAF of additional storage for CCWD.
3 Average amount of water available in the reservoir for a single-year emergency.
4 Environmental Water Management in Alternative 1 includes screened intakes, a 30-day No-Diversion period, multiple intake locations, and possible optimization of export reduction timing to benefit Delta fish. See description in Section ES.3.2 for details on these operations and benefits.



SOURCE: CCWD, 2008

Figure ES-3
Alternative 1 Benefits

Alternative 2: Expanded 275-TAF Reservoir, South Bay Connection, Environmental Water Management Emphasis

Key Features

- Expanded 275 TAF Reservoir
- Environmental Water Management Emphasis
- South Bay Connection of up to 470 cfs
- New Delta Intake Facility of up to 170 cfs
- Expanded Pipeline from Delta to Reservoir, to allow a total capacity of 670 cfs

This alternative includes the same facilities as Alternative 1, but would be operated to maximize environmental water management improvements. The water delivery operations for this alternative were designed to identify the effects and benefits associated with using an expanded Los Vaqueros Reservoir primarily to improve environmental water management. This alternative results in some increases in water supply reliability for Bay Area water agencies, but not to the same extent as Alternative 1.

Environmental Water Management

The water system operations for Alternative 2 would also shift Delta diversions for South Bay water agencies to the expanded Los Vaqueros system, resulting in the same fish protection improvements as described for Alternative 1. In addition, Alternative 2 would use the expanded storage to provide additional dedicated environmental water supplies:

1. *Fish Protection*. The fish protection benefits would be achieved in the same manner and similar magnitude as Alternative 1 – shifting South Bay water agencies' Delta diversions to the expanded Los Vaqueros system provides improved fish screening, a no-diversion period, and multiple intake locations to better protect Delta fish.

2. *Dedicated Storage for Environmental Water*. The expanded Los Vaqueros system would dedicate storage capacity for environmental water thereby creating an additional long-term water supply asset reserved for environmental purposes. The new stored environmental water supply assets could be used by the resource agencies in several ways, including environmental water supplies for Central Valley refuges, in-stream flows, additional SWP/CVP Delta export pumping curtailment, or other environmental purposes. For example, water from the expanded Los Vaqueros Reservoir system could be transferred downstream to San Luis Reservoir where it would be available for delivery to San Joaquin Valley wildlife refuges. It could also be used directly or by exchange to reduce Delta diversions during fish sensitive periods, to reduce direct take at other diversions, or to provide river flows for fishery purposes.

Water Supply Reliability

This alternative would provide some water supply reliability for Bay Area water agencies:

1. *Dry Year Storage*. The additional storage would increase the amount of water available in dry years to CCWD, reducing the need to purchase supplemental dry-year supplies. This alternative would not provide dry year water supply reliability to South Bay water agencies.

2. *Emergency Storage*. As with Alternative 1, increased stored water supplies would be available in emergencies for delivery to Bay Area water agencies through the South Bay Connection or existing interties.

The state-of-the-art fish screen operations described above would increase reliability for South Bay water agencies by making the deliveries less subject to the uncertainty associated with regulatory restrictions on the SWP and CVP Delta export pumps. However, under Alternative 2, additional Delta Supply Restoration deliveries would not be provided to restore water supplies to the South Bay water agencies that have been reduced due to export pumping restrictions.

Water Quality

Alternative 2 would also result in modest water quality improvements with reduced salinity levels in dry periods and improvements in temperature and turbidity because a substantial portion of supplies to the SBA would no longer pass through Clifton Court Forebay. The expanded reservoir would also improve water quality for CCWD by providing a larger supply of high quality water stored in the reservoir to blend with Delta supplies in dry years.

New and expanded facilities to increase the storage capacity of Los Vaqueros Reservoir are shown on Figure ES-2. **Table ES-3** shows the range of potential improvements for environmental water management, Bay Area water supply reliability, and water quality for Alternative 2.

TABLE ES-3
ALTERNATIVE 2 – SUMMARY OF BENEFITS

Operations	Benefits[1]		
	Long-term Average Yield	6-Year Drought	
		Annual Average Yield	Total
Environmental Water Management[4]	245 TAF/year	190 TAF/year	1,140 TAF
CCWD Water Supply Reliability[2]	NA	3 TAF/year	20 TAF
Emergency Water Storage[3]	215 TAF	145 TAF	NA
Additional Real-time Operating Benefits	Multiple intake locations to further avoid fish impacts; increased water supply reliability by reducing regulatory pumping restrictions Timing of pumping reductions at SWP/CVP Delta export facilities to further benefit fish		
South Bay Water Agencies Water Quality	Incidental taste & odor improvements Incidental salinity improvements		
CCWD Water Quality	Incidental improvement in CCWD's ability to meet its delivered water quality goal		

1 Long-term average and 6-year drought values based on 2030 level of development, moderate fishery restrictions.
2 Assumes 20 TAF of additional storage for CCWD.
3 Average amount of water available in the reservoir for a single-year emergency.
4 Environmental Water Management in Alternative 2 includes screened intakes, a 30-day No-Diversion period, multiple intake locations, dedicated storage for environmental water, and possible optimization of export reduction timing to benefit Delta fish. See description in Section ES.3.2 for details on these operations and benefits.

Alternative 3: Expanded 275-TAF Reservoir, No South Bay Connection, Environmental Water Management Emphasis

Key Features

- Expanded 275 TAF Reservoir
- Environmental Water Emphasis
- No South Bay Connection
- Expand Existing CCWD Intake Facilities by 70 cfs
- Expanded Pipeline from Delta to Reservoir, to allow a total capacity of 570 cfs

Alternative 3 includes the 275 TAF expanded reservoir like Alternatives 1 and 2, but does not include a South Bay Connection to Bethany Reservoir. The water system operations for this alternative were designed to evaluate whether it would be possible to achieve the project objectives without constructing the South Bay Connection and the associated new Delta Intake and Pump Station. Alternative 3 water system operations emphasize the use of an expanded Los Vaqueros Reservoir to improve Environmental Water Management. **Figure ES-4** shows the existing and new facilities for Alternative 3.

Environmental Water Management

Because Alternative 3 would not include the South Bay Connection, CVP and SWP supplies would not be delivered to South Bay water agencies through the expanded Los Vaqueros Reservoir system and the associated fish protection benefits would not be achieved. Alternative 3 would be operated to achieve environmental water management improvements in two ways:

1. *No-Diversion Period*. CCWD would cease pumping from the Delta during the most critical fish period in the spring and instead rely on releases from the expanded Los Vaqueros Reservoir.

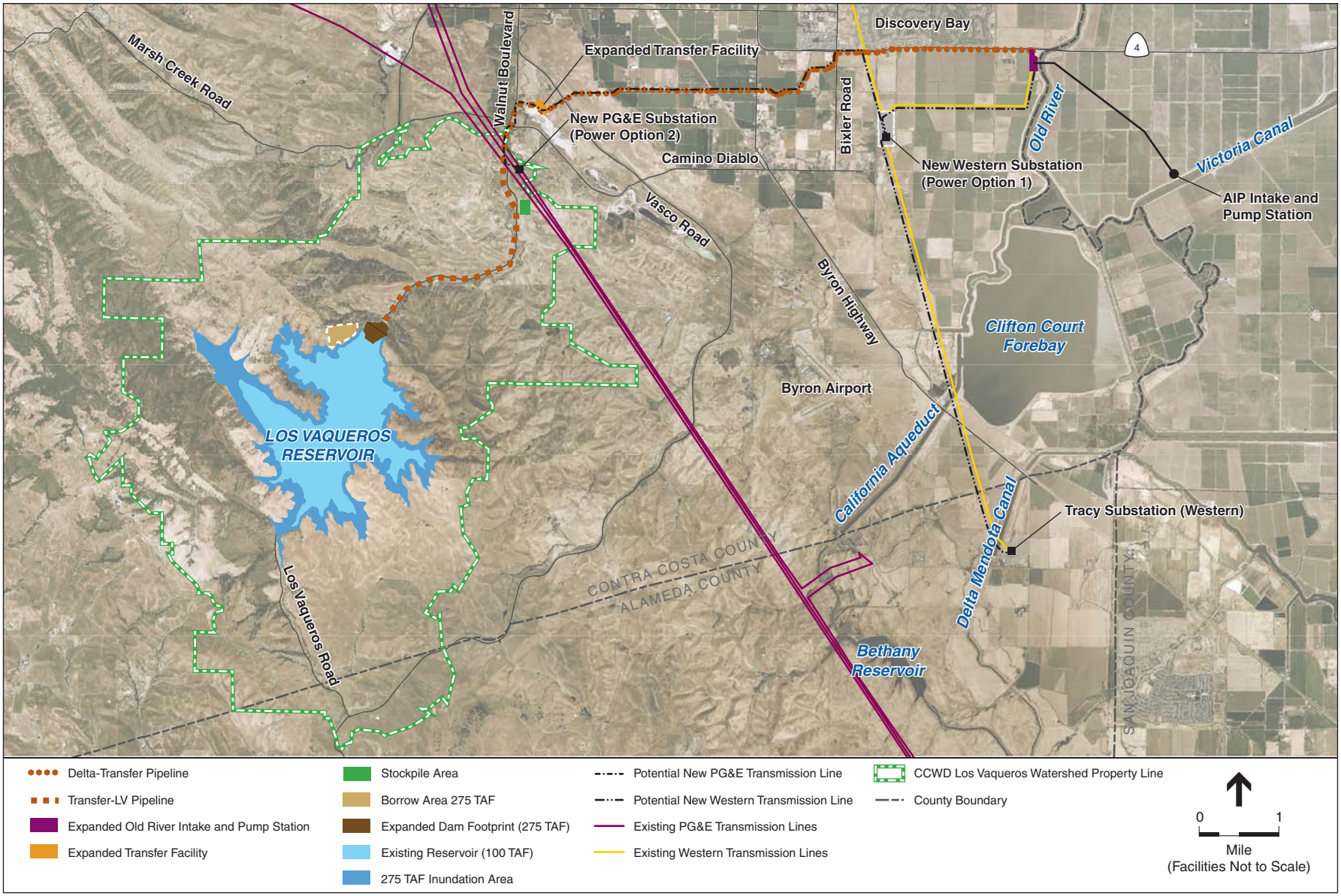
2. *Dedicated Storage for Environmental Water*. Additional stored water in the expanded reservoir would be reserved for environmental purposes. This could be accomplished through coordinated operations with Reclamation's CVP system. For example, when Reclamation has a need to retain cold water stored in upstream reservoirs, CCWD could refrain from pumping its CVP supply from the Delta and instead draw from the stored Los Vaqueros Reservoir supplies to serve its customers. The water stored upstream of the Delta in CVP reservoirs that had been reserved for delivery to CCWD could then be reallocated for environmental purposes, including cold water releases to support salmon spawning, pulse flow releases to support salmon migration, or water for wildlife refuges or other environmental purposes. The CVP water supply foregone by CCWD in this manner could also be conveyed through the Delta by existing export facilities for environmental purposes south of the Delta.

Water Supply Reliability

This alternative would provide water supply reliability improvements for CCWD and other Bay Area water agencies through existing interties or by exchange:

1. *Dry Year Storage*. The additional storage would increase the amount of water available in dry years to CCWD, reducing the need to purchase supplemental dry-year supplies.

2. *Emergency Storage*. Increased stored water supplies would be available in emergencies for delivery to Bay Area water agencies through existing interties or by exchange, but it would not be as flexible compared to alternatives with the South Bay Connection.



SOURCE: USGS, 1993 (base map); and ESA, 2008

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Figure ES-4

Proposed Facilities – Alternative 3

Water Quality

With no South Bay Connection, the expanded reservoir would only improve water quality for CCWD. The water quality benefit to CCWD under Alternative 3 is estimated to be similar to that provided in Alternatives 1 and 2, based on an additional 20 TAF of dry year storage. CCWD could receive additional incidental water quality benefits under Alternative 3 if releases of the Dedicated Storage for Environmental Water are made to reduce CCWD diversion of Delta water at times when Delta salinity is high. Such operations would not necessarily occur at times of high Delta salinity, so they do not guarantee additional water quality benefit for CCWD.

Table ES-4 shows the range of potential improvements for environmental water management, Bay Area water supply reliability, and water quality for Alternative 3.

TABLE ES-4
ALTERNATIVE 3 – SUMMARY OF BENEFITS

Operations	Benefits[1]		
	Long-term Average Yield	6-Year Drought	
		Annual Average Yield	Total
Environmental Water Management[4]	20 TAF/year	65 TAF/year	385 TAF
CCWD Water Supply Reliability[2]	NA	3 TAF/year	20 TAF
Emergency Water Storage[3]	235 TAF	130 TAF	NA
CCWD Water Quality	Incidental improvement in CCWD's ability to meet its delivered water quality goal		

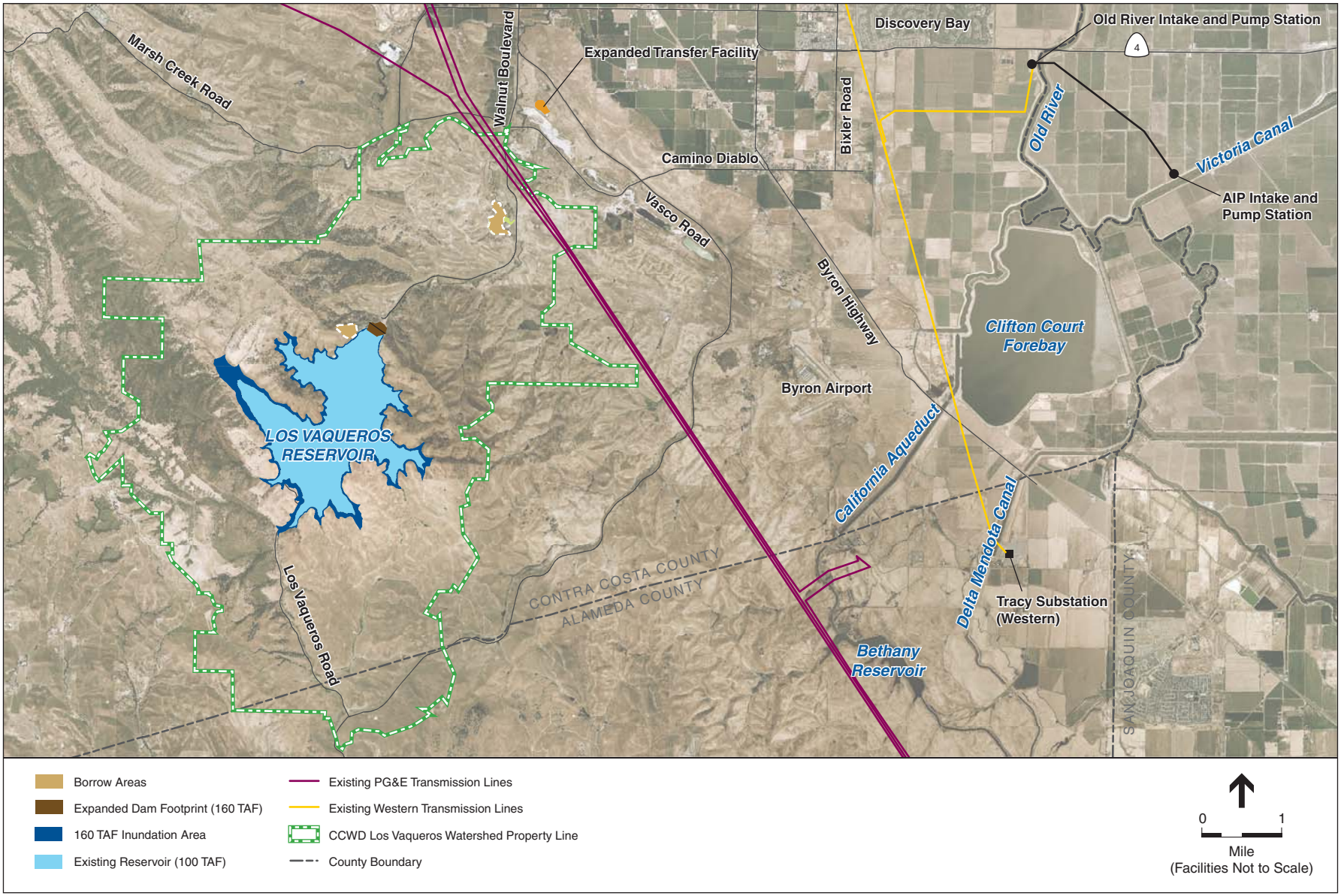
1 Long-term average and 6-year drought values based on 2030 level of development, moderate fishery restrictions.
2 Assumes 20 TAF of additional storage for CCWD.
3 Average amount of water available in the reservoir for a single-year emergency.
4 Environmental Water Management in Alternative 3 includes screened intakes, a 30-day No-Diversion period, and dedicated storage for environmental water. See description in Section ES.3.2 for details on these operations and benefits.

Alternative 4: Expanded 160-TAF Reservoir, No South Bay Connection, Water Supply Reliability Emphasis

Key Features

- Expanded 160 TAF Reservoir
- Water Supply Reliability Emphasis
- No South Bay Connection
- No change to Existing Intake Facilities
- No change to Pipeline from Delta to Reservoir

Alternative 4 includes a smaller reservoir expansion (from 100 TAF to 160 TAF) than Alternatives 1 through 3. No South Bay Connection connecting Los Vaqueros Reservoir to the South Bay water agencies would be constructed. There would be no changes to Delta intake facilities and no expansion of conveyance from the Delta to the reservoir. This alternative is included to evaluate the ability of a smaller reservoir expansion to improve water supply reliability for CCWD and participating Bay Area water agencies that could be served, directly or by exchange, through existing interconnections with CCWD. **Figure ES-5** shows the existing and new facilities for Alternative 4.



SOURCE: USDA, 2006; and ESA, 2008

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Figure ES-5

Proposed Facilities – Alternative 4

Environmental Water Management

Like Alternative 3, this alternative does not include a South Bay Connection, so CVP and SWP supplies could not be delivered directly to South Bay water agencies through the expanded Los Vaqueros Reservoir system and the associated fish protection benefits would not be achieved. Alternative 4 environmental water management improvements would result from water management flexibility at CCWD facilities:

1. *No-Diversion Period*. CCWD would cease pumping from the Delta during the most critical fish period in the spring and instead rely on releases from the expanded Los Vaqueros Reservoir.

Water Supply Reliability

This alternative would provide water supply reliability improvements for CCWD and other Bay Area water agencies through existing interties or by exchange:

1. *Dry Year Storage*. The additional storage would increase the amount of water available in dry years to CCWD and any other participating Bay Area water agencies, reducing the need to purchase supplemental dry-year supplies.

2. *Emergency Storage*. Increased stored water supplies would be available in emergencies for delivery to Bay Area water agencies through existing interties or by exchange.

Water Quality

With no connection to the South Bay water agencies, the expanded reservoir would only improve water quality for CCWD by providing a larger supply of high quality water stored in the reservoir to blend with Delta supplies in dry years.

Table ES-5 shows the range of potential improvements for environmental water management, Bay Area water supply reliability, and water quality for Alternative 4.

TABLE ES-5
ALTERNATIVE 4 – SUMMARY OF BENEFITS

Operations	Benefits[1]		
	Long-term Average Yield	6-Year Drought	
		Annual Average Yield	Total
Environmental Water Management[4]	NA	2 TAF/year	14 TAF
Water Supply Reliability[2]	NA	10 TAF/year	60 TAF
Emergency Water Storage[3]	120 TAF	80 TAF	NA
CCWD Water Quality	Percent of time that CCWD meets its delivered water quality goal increased by 5% (from 88% to 93%)		

1 Long-term average and 6-year drought values based on 2030 level of development, moderate fishery restrictions.
2 Assumes 60 TAF of additional storage for CCWD and any other participating Bay Area water agencies.
3 Average amount of water available in the reservoir for a single-year emergency.
4 Environmental Water Management in Alternative 4 includes screened intakes and a 30-day No-Diversion period. See description in Section ES.3.2 for details on these operations and benefits.

ES.4 Summary of Potential Environmental Impacts and Mitigation Measures

While the project alternatives are designed to provide benefits in the areas of fishery protection in the Delta, Bay Area water supply reliability and Bay Area drinking water quality, as described above, these alternatives also would result in some short-term and long-term impacts to the environment. **Table ES-7**, included at the end of this section, summarizes the environmental impacts associated with each of the project alternatives. For impacts determined to be significant, mitigation measures are presented and the impact significance after mitigation is shown. The environmental impacts associated with the project alternatives can be generally categorized as follows: project construction; facility siting / footprint; project operations; climate change; and growth-inducement.

ES.4.1 Construction

Most environmental impacts identified for the project alternatives would be associated with project construction; these impacts would occur for up to three years and would cease once project construction is completed. Construction impacts include effects associated with transport of construction materials and equipment and carrying out construction activities such as excavation, grading, foundation development, paving, and building of structures. Construction activities generate impacts such as noise, dust, indirect habitat disruption, temporary effects on agricultural activities, construction traffic and access disruption, increased erosion, or increased potential for spill of hazardous materials used in construction (such as fuel, or paint) and related water quality issues. In some cases, construction effects were found to be less than significant and in other cases they were determined to be significant. In all cases, feasible mitigation measures have been identified to reduce construction impacts to less than significant levels. There would be no significant and unavoidable construction impacts.

ES.4.2 Facility Siting / Footprint

Facility siting or footprint effects are the permanent effects that result from locating a facility on a specific site and removing or altering what was on the site previously. These types of impacts include conversion of farmland to non-agricultural uses, and effects on biological resources and habitats, cultural resources, visual resources, or other land uses as well as the potential for increased exposure to hazards. In some cases these types of impacts identified for the project alternatives were considered to be significant and in most cases, feasible mitigation measures were identified to reduce these significant effects to less than significant levels. Two footprint impacts were found to be significant and unavoidable: loss of important farmland and loss of a potential regional movement corridor for the San Joaquin kit fox.

Most of the significant footprint effects would be associated with expansion of the reservoir, which would result in adverse effects on biological and cultural resources.

Under Alternatives 1, 2 and 3 the reservoir would be expanded from 100 TAF to 275 TAF, which would increase the area of reservoir inundation by approximately 1,000 acres, from 1,500 acres to

2,500 acres. Under Alternative 4, reservoir expansion from 100 TAF to 160 TAF would inundate an additional 400 acres, increasing the area of inundation from 1,500 acres to 1,900 acres. The expanded reservoir would inundate existing habitat for biological resources, including various sensitive plant and animal species; inundation primarily would affect grassland habitat but also some oak woodland, scrub, and wetland habitats. The effects of reservoir expansion on biological resources would be mitigated to less than significant levels through implementation of a habitat compensation and enhancement program that would preserve, restore and enhance habitats of the type affected. However, one effect of reservoir expansion is considered significant and unavoidable, despite habitat mitigation. Reservoir expansion would inundate an area of grassland along the west side of the reservoir that could be used as a movement corridor by the San Joaquin kit fox, an endangered species. While there is no documented use of this grassland area by kit fox (surveys for kit fox activity within the Los Vaqueros Watershed were conducted prior to reservoir construction and have been conducted annually following reservoir completion since 1998). However, because it is suitable habitat for the kit fox, the grassland corridor along the west side of reservoir is considered to be a potential movement corridor and loss of much or all of this grassland due to reservoir inundation is, therefore, considered to be a significant and unavoidable impact of the project.

Dam modification and reservoir expansion would also affect cultural resources; mitigation measures have been identified to reduce these effects to less than significant levels. Relocation of existing recreation facilities and the addition of new recreation facilities proposed under all alternatives would result in relatively small footprint effects on habitats within the watershed. These effects would be reduced to less than significant levels through the habitat mitigation program.

Significant effects on agricultural resources would occur outside the watershed. Construction of the new Delta Intake and Pump Station, proposed under Alternatives 1 and 2, would result in loss of up to 22 acres of farmland that is designated as important farmland by the state. The entire area along Old River is designated as such, thus the impact to this farmland is unavoidable. Although this facility would occupy a relatively small amount of land, the impact on important farmland is considered significant and unavoidable.

Construction of new pipelines would result in only very limited footprint impacts. Pipelines would be buried and the surface area restored.

Under Alternative 4, use of the proposed borrow area to extract material for expanding the dam core could result in a permanent effect on the visual quality and character of the surrounding area in the lower Kellogg Valley but this effect would be mitigated to less than significant level through implementation of a site restoration plan.

ES.4.3 Project Operations

Project operation effects relate primarily to the proposed diversion of water from the Delta for delivery to the potential project participants: the South Bay water agencies and CCWD. By design, the project alternatives are intended to benefit Delta fishery resources. Therefore, impacts

to Delta resources have been minimized as part of the design of the proposed project operations. The one exception is associated with project operations under Alternative 3. Under this alternative, additional water would be diverted through the expanded Los Vaqueros Reservoir system and, unlike conditions under Alternatives 1 and 2, this water diversion would not be offset by a commensurate reduction in Delta water diversion from the CVP and SWP Delta export pumps. Consequently, additional fish could be adversely affected by the increased Delta diversion. This would be a significant and unavoidable impact of Alternative 3. By contrast, Alternatives 1 and 2 would provide a substantial benefit for Delta fishery resources. Use of improved fish screens for diversion of water for South Bay water agencies would improve conditions for Delta fishery resources; benefits could be further increased through adaptive management of the timing of offsetting pumping reductions.

Also by design, water diversion operations under each of the project alternatives would not result in significant adverse effects on water supplies for other Delta water users.

Operation of individual project facilities within the expanded system would not result in significant long-term impacts such as noise, air quality pollutant emissions, or public safety risks.

ES.4.4 Climate Change

This Draft EIS/EIR examines the potential for the project alternatives to increase greenhouse gas emissions, which in turn would contribute to global climate change effects. As a global concern, increases in greenhouse gases contribute to cumulative impacts, rather than constituting a direct impact associated with a single project. This Draft EIS/EIR also reviews changes in water supply availability, sea level rise and the potential for increased flooding caused by climate change to assess how the project might affect or be affected by these environmental changes.

Project construction and operation would result in increased greenhouse gas emissions. Construction emissions would be short-term, ceasing after three years upon project completion. Greenhouse gas emissions associated with project operation would result primarily from the purchase and use of additional electrical energy to support water diversion and delivery pumping through the expanded Los Vaqueros Reservoir system. Under Alternatives 1 and 2, the increase in water diversion and delivery pumping proposed under the project would be partially offset by reductions in water pumping elsewhere, specifically through the state and/or federal Delta water export systems. The project alternatives would not conflict with any measures adopted by the state or other agencies to implement the California Global Warming Solutions Act of 2006 (AB 32), the state law that requires the Air Resources Board to design and implement measures to reduce greenhouse gas emissions to 1990 levels by 2020. Further, the project alternatives include the following features designed to minimize energy consumption and greenhouse gas emissions: on-site borrow areas to supply dam construction materials; local acquisition of construction materials; efficient pumping facilities; incorporation of solar panels in the roof of the Marina Complex and new interpretive center; in-system energy recovery in the Transfer-Bethany Pipeline; and use of CCWD's low emission, fuel efficient vehicle fleet. The Draft EIS/EIR finds that the project would not result in a cumulatively considerable increase in greenhouse gas emissions.

With respect to the potential effects of climate change, the project increases the flexibility of local and regional water supply systems to adapt to changes in water supply availability. Increasing water storage capacity and flexibility to adjust the timing and location of water diversion from the Delta improves the ability of local, regional and state water managers to adjust water supply operations to respond to potential changes in water supply availability as well as to respond to changing environmental conditions in the Delta.

ES.4.5 Growth-Inducement

None of the project alternatives would be directly growth inducing. The project alternatives are designed to improve water supply reliability for select Bay Area water agencies. Alternative 1 is designed to provide the greatest level of water supply reliability for the South Bay water agencies. This alternative would restore an increment of Delta water supply deliveries that the South Bay water agencies previously anticipated receiving in the future but would not receive because of court-ordered restrictions imposed in 2007. These restrictions reduce the delivery reliability of both the CVP and SWP Delta export systems.

While each of the project alternatives would improve water supply reliability for CCWD and/or the South Bay water agencies, none would provide a substantial new or additional source of supply. Each of these agencies has prepared a long-term future water supply plan; Delta water supply is a central component in each. These long-term water supply plans have been designed to provide adequate water supply to meet the needs of both existing customers and the growth that has been planned in each service area by the respective city and county land use agencies. The potential environmental effects of this future planned growth have been evaluated and fully disclosed previously in the CEQA environmental documents prepared on the long-term water supply plans for CCWD and the South Bay water agencies.

ES.4.6 Significant and Unavoidable Impacts

As shown in Table ES-7, all action alternatives (Alternatives 1, 2, 3, and 4) would result in the following significant and unavoidable impacts:

- Loss of grassland area along the west side of the reservoir that is a potential (although undocumented) movement corridor for the endangered San Joaquin kit fox.

Alternatives 1 and 2 would result in the following additional significant and unavoidable impact:

- Loss of up to 22 acres of important farmland as designated by the state. This is both a direct project impact and a cumulative effect of the project.

Alternative 3 would result in the following additional significant and unavoidable impact:

- Increased adverse impact of Delta fishery resources due to increased water diversion from the Delta. This is both a direct project impact and a cumulative effect of the project.

Mitigation has been included where feasible to reduce these direct, indirect, and cumulative impacts but would not be sufficient to reduce them to a less-than-significant level.

ES.5 Issues of Known of Controversy and Issues to be Resolved

ES.5.1 Issues of Known Controversy

Based on public and agency comments received throughout the project planning process, Reclamation and CCWD have identified the following areas of controversy related to the proposed expansion of Los Vaqueros Reservoir. Appendix A-1, Scoping Report, summarizes all of the issues raised by agencies and the public during the public scoping process in December 2006 through February 2006.

Delta Sustainability

As described above, the Delta is critically important to the health of California's economy and environment. Conflicts and controversy have defined water operations in the Delta for decades. Significant efforts are underway to identify plans and operations for a sustainable Delta in the future. The expansion of Los Vaqueros Reservoir can be a near-term action to alleviate some of the conflict and controversy regarding water diversions and environmental protection. The reservoir expansion project can also be coordinated with the long-term solutions as they are developed. For any reasonably foreseeable solutions, the reservoir expansion enhances the flexibility and benefits.

Delta Fisheries

The health and sustainability of Delta fisheries populations and habitat has been of high concern with recent species decline. The benefits and effects of the reservoir expansion project for Delta fisheries are described in this Draft EIS/EIR.

Water Supply

The reliability of water supplies from the Delta is highly important for Bay Area water agencies, particularly in light of recent court orders and regulatory changes affecting Delta exporting pumping.

Other Environmental Effects

The following potential environmental effects of the reservoir expansion and any necessary mitigation are of interest and concern to agencies and the public. These issues are evaluated and addressed in this Draft EIS/EIR:

- **Delta Hydrology and Water Quality** – The potential effects on Delta hydrology, water quality, and water operations, including the cumulative effects of Delta diversions and operations.

- **Terrestrial Impacts** – The potential terrestrial species and habitats effects of the increased reservoir inundation area and new or expanded intakes and conveyance facilities

- **Cultural/Historical Resources** – The effects on important cultural resources in and around the Los Vaqueros Watershed.

- **Recreation** – The equivalent replacement and enhancement of recreational resources in the Los Vaqueros Watershed is an important public issue and commitment by the CCWD Board of Directors.

ES.5.2 Issues to be Resolved

Reclamation and CCWD will need to identify a preferred alternative. The decision will be based on project benefits, potential environmental effects, and numerous factors including the type of financing available, permitting requirements, and implementation schedule. Other issues to be resolved include:

- Further discussion and negotiation is necessary to determine the level of participation by other beneficiaries. These discussions would lead to agreements among all participants on project benefits and financial participation.

- The CCWD Board of Directors will be reviewing the alternatives to determine the ability to meet the principles the Board established for participation in the reservoir expansion.

- The selection of an alternative will determine the overall project benefits for the environment, Bay Area water supply reliability and water quality. Project design and operations will also be refined through the environmental permitting process, in particular compliance with the federal and state Endangered Species Acts, which will also affect the overall project benefits. The selection of an alternative also determines the level and type of environmental impacts, as described in this Draft EIS/EIR.

- Regardless of which alternative is selected for implementation, detailed design of project features and planning of construction will need to be coordinated with mitigation requirements so that sensitive resources in the project areas are avoided where practicable. The methods for achieving required mitigation would be determined during detailed project design through consultation and coordination with the permitting agencies.

- Completion and conclusions of the Federal Feasibility Report including related engineering design, economic (costs and benefits), and financial analyses as a basis for determining the type and extent of federal interest in project implementation.

- Completion and conclusions of the State Feasibility Report as a basis for determining the type and extent of state interest in project implementation.

- Completion and conclusions of public review of this Draft EIS/EIR and the subsequent Final EIS/EIR as a basis for determining mitigation commitments, the Environmentally Superior Alternative per CEQA, and the LEDPA per Clean Water Act (CWA), Section 404(b)(1).

ES.6 Relationship to Environmental Protection Statutes, Plans, and Other Requirements

This Draft EIS/EIR has been prepared in consideration of NEPA, CEQA, and other pertinent federal, state, and local environmental regulations. NEPA requires that environmental consequences of a Proposed Action and project alternatives be considered before the decision making for implementation of a federal project. CEQA requires that environmental consequences of a Proposed Project and project alternatives be considered before approval, financing, or participation by the lead agency pursuant to CEQA. Chapter 7 of this Draft EIS/EIR presents the applicable environmental laws, regulations, and alternative plans being considered and the intended uses and users of the document. This Draft EIS/EIR is not a decision document and is not serving as public notice for any permit actions.

Table ES-6 summarizes the status of consultation for the requirements that must be met by Reclamation and CCWD before the Los Vaqueros Reservoir Expansion Project can be built and operation of facilities implemented.

ES.7 Public Involvement and Next Steps

During the Public Scoping process, CCWD met with potentially interested agencies and stakeholders from January through June 2006 to provide an overview of the proposed project alternatives and solicit their input. The objective of this effort was to obtain public input about issues as early as possible in the environmental review process.

Outreach activities have included continuous coordination with and input from public agencies including DWR, USFWS, CDFG, NMFS, and local Bay Area water agencies through regularly held ACWG meetings and additional briefings. CCWD has presented at various CALFED-related public meetings including environmental justice workshops and tribal forums. Meetings have been held with agency staff working as part of multi-agency CALFED workgroups, as well as staff working only for their respective agencies on non-CALFED-related activities. CCWD regularly participates in the CALFED Bay-Delta Public Advisory Committee, Water Supply Subcommittee together with representatives from Reclamation, DWR, CALFED Bay-Delta Authority, statewide water agencies, and stakeholders.

In accordance with CEQA and NEPA review requirements, this Draft EIS/EIR will be circulated for public and agency review and comment for a 60-day period following the date when the U.S. Environmental Protection Agency publishes the Notice of Availability of Weekly Receipt of Environmental Impact Statements in the Federal Register, and the filing of the Notice of Completion with the California State Clearinghouse. Five public hearings have been scheduled in Concord, Dublin, Livermore, Oakley, and Sacramento to receive public input on the Draft EIS/EIR. These hearings will be held during the public review and comment period so that any comments received at the hearings can be addressed in the Final EIS/EIR. In addition, written comments from the public, reviewing agencies, and stakeholders will be accepted during the public comment period.

TABLE ES-6
SUMMARY OF ENVIRONMENTAL COMPLIANCE FOR THE PROPOSED PROJECT

Requirements	Status of Compliance/Expected Completion
National Environmental Policy Act	Ongoing until this EIS/EIR Record of Decision published.
California Environmental Quality Act	Ongoing until this EIS/EIR document certified and mitigation met.
Federal Endangered Species Act and California Endangered Species Act	Ongoing until project Biological Opinion issued (see Sec. 4.6 Biological Resources).
Magnuson-Stevens Fishery Conservation and Management Act	Ongoing until project Biological Opinion issued (see Sec. 4.3 Delta Fisheries and Aquatic Resources).
Fish and Wildlife Coordination Act	Ongoing until Fish and Wildlife Coordination Act Report issued (see Sections 4.3 Delta Fisheries and Aquatic Resources and 4.6 Biological Resources).
Clean Water Act Section 401	CCWD will apply for Water Quality Certification after EIS/EIR is approved and project design underway (see Sec. 4.5 Local Hydrology, Drainage, and Groundwater).
Clean Water Act Section 404	CCWD will apply for Wetland Permit after the EIS/EIR is approved and project design underway (see Sec. 4.6 Biological Resources).
Clean Air Act	In compliance. Conformity analysis is not required. (see Sec. 4.10 Air Quality).
National Historic Preservation Act and Native American Consultation	Ongoing. Once Section 106 review process is completed, the project will proceed in accordance with conditions stipulated in the agreement with the State Historic Preservation Officer and appropriate agencies (see Section 4.16 Cultural and Paleontological Resources).
Executive Order 11988 - Floodplain Management	Ongoing. The project complies by using this EIS/EIR to identify and assess project effects (see Section 4.5 Local Hydrology, Drainage, and Groundwater).
Executive Order 11990 - Protection of Wetlands	CCWD will apply for Wetland Permit after the EIS/EIR is approved and project design underway (see Sec. 4.6 Biological Resources).
Executive Order 12898 - Environmental Justice	In compliance based on EIS/EIR Sec. 4.18 Environmental Justice.
Migratory Bird Treaty Act	Reclamation and CCWD will comply with provisions of the Migratory Bird Treaty Act (see Sec.4.6 Biological Resources).
California Fish and Game Code (Section 1600 Lake or Streambed Alteration Agreement Program)	Ongoing. The project complies with Section 1600 by using this EIS/EIR to identify and address expected project effects (Sec. 4.6 Biological Resources).
Caltrans Encroachment Permit	As needed, CCWD will apply for a Caltrans Encroachment Permit to construct within Caltrans right-of-way prior to construction (see Sec. 4.9 Transportation and Circulation).
Disabilities Regulations - Americans with Disabilities Act, Rehabilitation Act, and Architectural Barriers Act	Project will adhere to the construction guidelines of the Uniform Federal Accessibility Standards and comply with regulations proposed for incorporation into the Americans With Disabilities Act Accessibility Guidelines as a part of design for individual facilities.
Farmland Protection Policy Act	Ongoing. (see 4.8 Agriculture).
Section 10 of the Rivers and Harbors Act of 1899	Ongoing. This regulation is addressed in coordination with wetlands regulations (see Clean Water Act, Section 404, above).
NPDES Construction Stormwater Permit	CCWD will comply by preparing and using a Storm Water Pollution Prevention Plan at the time of construction (see Sec. 4.5 Local Hydrology, Drainage and Groundwater).
General Order for Dewatering and Other Low Threat Discharge to Surface Waters	CCWD will comply by preparing and using a permit at the time of construction (see Sec. 4.5 Local Hydrology, Drainage and Groundwater).

A Final EIS/EIR that will include responses to all comments will be prepared and circulated in accordance with NEPA and CEQA requirements. The Final EIS/EIR will be circulated for 30 days prior to taking action on the project and issuance of a ROD.

CCWD Decision Making Process

Following lead agency (Reclamation and CCWD) consideration of all comments received during public review of the Draft EIS/EIR and circulation of the Final EIS/EIR, the CCWD Board of Directors will hold a public meeting to consider certification of the Final EIR and to decide whether to approve the Proposed Action or an alternative. A Notice of Determination documenting the decision will then be issued. To support a decision on the project, the CCWD Board of Directors must prepare and adopt written findings of fact for each significant environmental impact identified in the Final EIS/EIR; a Statement of Overriding Considerations, if needed; and a Mitigation Monitoring and Reporting Program to ensure implementation of the mitigation measures and project revisions, if any, identified in the Final EIS/EIR.

The EIS/EIR is intended to be used by the CCWD Board of Directors when considering approval of the project. The CCWD Board of Directors will use the Final EIS/EIR to consider approval of the entire project. If necessary CCWD will use the Final EIS/EIR to petition the State Water Resources Control Board for water rights changes.

Federal Decision Making Process

Federal decision making will be based on the information contained in the Federal Feasibility Report, in compliance with the Federal Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (federal P&Gs), and information analyzed in compliance with NEPA (U.S. Water Resources Council, 1983). These documents will present the results of the feasibility study authorized by Public Law 108-7 and reaffirmed by Public Law 108-361.

Integral to the federal decision process are other legally required processes and information, such as biological opinions from the Federal Endangered Species Act consultation process and permits required by federal, state and local laws. The federal decision process also includes consideration of input from other federal, state, and local agencies, concerned stakeholders, tribes, and the general public.

The final federal decision is documented in a ROD. The ROD will address the decision and the alternatives considered; the alternative(s) considered to be environmentally preferable; the factors that were considered; whether or not all practicable means to avoid or minimize environmental harm for the alternative selected have been adopted, and if not, why; any monitoring and enforcement program established to ensure identified mitigation measures are accomplished; and any significant comments received on the Final EIS/EIR.

Reclamation. Reclamation is the federal lead agency, as delegated by the Secretary of the Interior, and therefore is responsible for the preparation and processing of the Federal Feasibility

Report and EIS. For efficiency, the EIS has been combined with an EIR, prepared by CCWD for compliance with the CEQA.

While the NEPA compliance process is a subset of the federal feasibility study process, there are important distinctions to make. The purpose of the NEPA process is to analyze and disclose the impacts of a range of alternatives, and to provide an opportunity for public review and comment prior to the final federal decision. The purpose of a Federal Feasibility Report is to address engineering, economic, environmental and financial aspects of alternatives, determine the potential benefits and costs, and determine if there is a federal interest in the implementation of a project.

Upon completion of the Final Federal Feasibility Report and the Final EIS/EIR, Reclamation's Mid-Pacific Regional Director will make a recommendation that will be submitted to the Commissioner of Reclamation for consideration. Then, the Commissioner will concur or modify the recommendation and forward the Final Federal Feasibility Report, Final EIS/EIR, and Draft ROD to the Secretary of the Interior.

Secretary of the Interior. The Secretary will review the Federal Feasibility Report and sign the ROD if he concurs with the recommendation and then send the Final Federal Feasibility Report, Final EIS/EIR, and signed ROD to Office of Management and Budget (OMB) for review.

OMB. In accordance with Executive Order 12322, OMB will review the Federal Feasibility Report for consistency with the policy and programs of the President, the federal P&Gs, and other applicable laws, regulations and requirements relevant to the federal planning process.

Congress. Congress will review the information provided by the Secretary and OMB, and then decide whether to authorize the recommended project. Congress is responsible for authorizing projects for construction and providing appropriations to construct projects.

Other Uses and Users of the EIS/EIR

Western will use the Final EIS/EIR to evaluate the environmental effects of approving provision of additional power supply to the new/expanded facilities – including construction and operation of new facilities and sale of additional energy supply to CCWD. Other cooperating, responsible and participating agencies will use the Final EIS/EIR when taking actions on the project including decisions to participate in the project, issuance of permits, and regulatory approvals.

TABLE ES-7
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.2: Delta Hydrology and Water Quality				
4.2.1: The project alternatives would not adversely alter deliveries of water to other users.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.2.2: The project alternatives would not result in significant adverse changes in Delta water quality causing the violation of a water quality standard.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.2.3: The project alternatives would not result in changes to Delta water quality that would result in significant adverse effects on beneficial uses.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.2.4: Diversions of Delta water under the project alternatives would not result in a significant reduction of Delta water levels.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.2.5: The project alternatives would not result in a cumulatively considerable contribution to significant adverse cumulative effects on deliveries of water to other users, changes in Delta water quality, or change in Delta water levels.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.3: Delta Fisheries and Aquatic Resources				
4.3.1: In-channel construction activities associated with the proposed new Delta Intake structure would increase short-term localized suspended sediment, turbidity, and possibly contaminant concentrations within Old River, which would increase exposure of various life stages and species of fish to temporarily degraded water quality conditions.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM NI NI	**Implementation of Hazardous Materials Mitigation Measure 4.13.2:** This mitigation measure involves implementation of best management practices to keep hazardous materials from accidental release. See Section 4.13 for description of this measure. **Implementation of Hydrology Mitigation Measure 4.5.1a:** This mitigation measure involves implementation of a storm water pollution prevention plan. See Section 4.5 for description of this measure.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.3: Delta Fisheries and Aquatic Resources (continued)				
(4.3.1 continued)			**Measure 4.3.1:** To minimize sediment, turbidity, and contaminants in Old River during construction of the new Delta Intake (primarily excavation and cofferdam installation), CCWD or its contractors will obtain and comply with RWQCB Section 401 water quality certification, CDFG streambed alteration agreement, USACE Clean Water Act Section 404 permit, as needed, and adhere to the following requirements: • Monitor periods of construction activity and coordinate with the contractor to identify periods when localized increases in turbidity may occur. • Install a silt curtain to reduce the dissipation of suspended sediments during dredging and cofferdam installation. • Ensure that cofferdam(s) installation occurs during the designated construction window of August 1 through November 30 to avoid the potential risk of adverse impacts on chinook salmon, steelhead, delta smelt, and other aquatic species which are more abundant in the area during fall, winter, and spring. This construction window may be shifted through consultation with USFWS, NMFS, and CDFG if the best available fish survey data indicate that a different construction window for cofferdam installation will avoid or minimize effects on special-status species. • Minimize substrate disturbance during construction activities. • Ensure project construction activities will not cause significant turbidity increases in surface waters, as follows: - Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTU), increases will not exceed 1 NTU. - Where natural turbidity is between 5 and 50 NTU, increases will not exceed 20 percent. - Where natural turbidity is between 50 and 100 NTU, increase will not exceed 10 NTU. - Where natural turbidity is greater than 100 NTU, increases will not exceed 10 percent. • These limits will be eased during in-water working periods to allow a turbidity increase of 15 NTU over background turbidity as measured in surface waters 300 feet downstream from the working area. In determining compliance with the above limits, appropriate averaging	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.3: Delta Fisheries and Aquatic Resources (continued)				
(4.3.1 continued)			periods may be applied, provided that Delta fisheries and aquatic resources would be fully protected. • Ensure project construction activities will not cause settleable matter to exceed 0.1 milliliters per liter in surface waters, as measured in surface waters 300 feet downstream from the project. • In the event that project construction activities create a visible plume in surface waters, initiate monitoring of turbidity levels at the discharge site and 300 feet downstream, taking grab samples for analysis of NTU levels twice per day during the work period while the visible plume persists. • Notify the RWQCB, CDFG, USFWS, and NMFS if the above criteria for turbidity are exceeded. • Notify the RWQCB, CDFG, USFWS, and NMFS of any spill of petroleum products, oil/grease, or other organic or earthen materials. • If the required permits from RWQCB, CDFG, USFWS or NMFS include conditions equivalent to any mitigation measure set forth above, substitute the permit condition for the equivalent mitigation measure.	
4.3.2: Underwater sound-pressure levels generated during cofferdam installation for the new Delta Intake could result in behavioral avoidance or migration delays for special-status fish species.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM NI NI	**Measure 4.3.2:** As discussed in Mitigation Measure 4.3.1, construction of the cofferdam for the new Delta Intake will be limited to the seasonal period between August 1 and November 30. This measure will also help avoid potential impacts to special-status fish species due to underwater sound pressure levels generated during coffer dam installation. To further reduce and avoid impacts to resident fish present in the south Delta in the immediate vicinity, the cofferdam would be installed using a vibration hammer that minimizes underwater sound pressure levels. If it is determined that a higher intensity percussion hammer would be required for installing the cofferdam, underwater sound pressure level monitoring would be performed by an acoustic expert to document sound pressure levels during cofferdam construction. Limiting construction related underwater sound pressure levels during cofferdam installation to less than 160 dB would reduce potential fishery impacts to a less-than-significant level. If monitoring indicates higher sound pressure levels than 160 dB, in-water construction activity would be suspended and avoidance of potential adverse effects would be achieved by consulting with USFWS, NMFS, and CDFG to determine and implement the appropriate actions, which would include one or more of the following:	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.3: Delta Fisheries and Aquatic Resources (continued)				
(4.3.2 continued)			• Surveying Old River at the intake site to determine fish presence before installation, and modifying the work window accordingly; • Use of an air bubble curtain to deflect and absorb sound pressure; • Use of lower intensity underwater sounds to repel fish from the immediate construction area before use of a high-pressure hammer; • Limiting the duration and frequency of high-pressure underwater sound levels during cofferdam installation.	
4.3.3: Dewatering of the cofferdam for the new Delta Intake could result in stranding of fish.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM NI NI	**Measure 4.3.3:** As discussed in Mitigation Measure 4.3.1, construction of the cofferdam for the new Delta Intake will be limited to the seasonal period between August 1 and November 30. This measure will also help avoid potential impacts to special-status fish species due to coffer dam dewatering. Additionally, CCWD will implement a fish rescue plan acceptable to CDFG, USFWS, and NMFS. CCWD shall ensure that a qualified fishery biologist designs and conducts the fish rescue and relocation effort to collect fish (all species) from the area behind the cofferdam. The fish rescue would be implemented during the dewatering of the area behind the cofferdam for the new Delta Intake and would involve capturing and relocating the fish to suitable habitat within Old River. To ensure compliance, a fisheries biologist shall be present onsite during initial dewatering activities. CCWD shall monitor progress of installation of the cofferdam and the schedule for dewatering. CCWD shall coordinate the dewatering schedule with the construction contractor and fishery biologist to allow for the fish rescue to occur before completely closing the cofferdam, and again during dewatering when water is about 2 feet deep at the shallowest point within the cofferdam. USFWS, NMFS, and CDFG shall be notified at least 48 hours before the fish rescue. Information on the species and sizes of fish collected in the rescue and estimates of survival just before release would be recorded during the time of the fish rescue and provided in a letter report to be submitted within 30 days after the fish rescue to USFWS, NMFS, and CDFG.	No Impact Less Than Significant
4.3.4: The new Delta Intake structure and associated fish screens in Old River would physically exclude fish from a small area of existing aquatic habitat and modify existing aquatic habitat.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM NI NI	**Implementation of Biological Resources Mitigation Measure 4.6.2b:** This mitigation measure provides for compensatory mitigation for the permanent impacts to habitat. See Section 4.6 for description of this measure.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.3: Delta Fisheries and Aquatic Resources (continued)				
4.3.5: The new Delta Intake structure and associated fish screens in Old River would modify hydraulic conditions next to the intake structure, but would not disorient special-status fish or attract predatory fish.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS NI NI	None Required.	No Impact Less Than Significant
4.3.6: Operation of the project alternatives would not result in changes to Delta hydrologic conditions that affect Delta fish populations or quality and quantity of aquatic habitat within the Sacramento-San Joaquin River system, including the Delta.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required.	No Impact Less Than Significant
4.3.7: Operation of the new screened intake, or changes to diversions at existing intakes, could affect direct entrainment or impingement of fish.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI B B SU LS	None Required.	No Impact Beneficial Significant & Unavoidable Less Than Significant
4.3.8: Fish screen maintenance activities would not significantly increase fish entrainment at the new Delta Intake or the expanded Old River Intake.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS NI	None Required.	No Impact Less Than Significant
4.3.9: The project, when combined with other planned project alternatives, or projects under construction in the area, could cumulatively contribute to substantial adverse impacts to Delta fisheries and aquatic resources.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM SU LS	**Mitigation for Cumulative Impacts:** Implementation of Delta Fisheries and Aquatic Resources Mitigation Measures (Measures 4.3.1, 4.3.2 and 4.3.3), together with Hazardous Materials Mitigation Measure 4.13.2, Hydrology Mitigation Measure 4.5-1a and Biological Resources Mitigation Measure 4.6.2b, will reduce potential impacts to less-than-significant levels. No additional measures will be required.	No Impact Less Than Significant Significant & Unavoidable
Section 4.4: Geology, Soils and Seismicity				
4.4.1: The project facilities would be designed and engineered in accordance with seismic code requirements. As a result, the project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking or seismic-related ground failure, including liquefaction and landslides.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.4: Geology, Soils and Seismicity (continued)				
4.4.2: During construction and operations, the project could result in substantial soil erosion or the loss of topsoil.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Implementation of Hydrology Mitigation Measures** (Measures 4.5.1a and 4.5.1b) and Biological Resources Mitigation Measures (Measures 4.6.2a and 4.6.2b) would reduce potential impacts of soil erosion and topsoil loss to a less-than-significant level. No additional measures would be required.	No Impact Less Than Significant
4.4.3: Project components could be located on expansive or corrosive soils or on a geologic unit or soil that is unstable or could become unstable as a result of the project or construction activities; however, those components would not likely result in onsite or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse, and would not create substantial risks to life or property.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.4.4: The proposed project would not make a cumulatively considerable contribution to cumulative effects associated with erosion, topsoil loss or increased exposure to seismic or other geohazard risks.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.5: Local Hydrology, Drainage and Water Quality				
4.5.1: During construction, the project alternatives could violate water quality standards through increased erosion and sedimentation to local waterways, release of fuels or other hazardous materials during construction, or dewatering of excavated areas that could result in substantial water quality degradation.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.5.1a:** CCWD shall ensure that a Storm Water Pollution Prevention Plan (SWPPP) is prepared in accordance with the requirements of the RWQCB's NPDES General Construction Permit requirements. The SWPPP will be designed to identify and control pollutant sources that could affect the quality of stormwater discharges from the construction sites through the development of best management practices (BMPs). BMPs will include those that effectively target pollutants in stormwater discharges to prevent or minimize the introduction of contaminants into surface waters. To protect receiving water quality, the BMPs will include, but are not limited to, the following: • Temporary erosion control measures (fiber rolls, staked straw bales, detention basins, check dams, geofabric, sandbag dikes, or temporary revegetation or other ground cover) will be employed for disturbed areas.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.5: Local Hydrology, Drainage and Water Quality (continued)				
(4.5.1 continued)			• No disturbed surfaces will be left without erosion control measures in place during the winter and spring months. • Sediment will be retained onsite by a system of sediment basins, traps, or other appropriate measures. • The construction contractor will prepare standard operating procedures for the handling of hazardous materials on the construction site to prevent discharge of materials to stream or storm drains. This will include the contractor establishing specific fueling areas for construction vehicles and equipment located at least 200 feet from drainages. Grading areas must be clearly marked and equipment and vehicles must remain within graded areas. The contractor will also identify and implement as appropriate specific procedures for handling and containment of hazardous materials, including catch basins and absorbent pads. • Wherever construction work is performed near a creek, reservoir, or drainage area (excluding work that is permitted for working in the drainage itself), a 100 foot vegetative or engineered buffer will be maintained between the construction zone and surface water body. Specific water bodies to be protected through implementation of this BMP include but are not limited to: Los Vaqueros Reservoir, Kellogg and Brushy Creeks, Bethany Reservoir, the South Bay Aqueduct, and/or other seasonal drainages. • Native and annual grasses or other vegetative cover will be established on construction sites immediately upon completion of work causing disturbance. **Measure 4.5.1b:** If groundwater cannot be contained onsite during construction, the construction contractor(s) will ensure that the water is pumped into multiple Baker tanks or approved equivalent with either a filter or gel coagulant system or other containment to remove sediment. The remaining water will then be discharged to a designated receiving water body or via land application in accordance with the requirements of RWQCB Order No. 5-00-175. On upland areas, sprinkler systems may be used to disperse the water in support of revegetation efforts. BMPs, as described in the SWPPP, will also be implemented to retain, treat, and dispose of groundwater. Measures will include but are not limited to:	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.5: Local Hydrology, Drainage and Water Quality (continued)				
(4.5.1 continued)			• Retaining pumped groundwater in surface facilities to reduce turbidity and suspended sediment concentrations; • Treating (i.e., flocculating) pumped groundwater to reduce turbidity and concentrations of suspended sediments if turbidity exceeds RWQCB effluent limitations as defined in General Order 5-00-175; • Directly conveying pumped groundwater to a suitable land disposal area capable of percolating flows; • If contamination is suspected, water collected during dewatering will be tested for contamination prior to disposal; • Discharges will comply with the RWQCB's requirements.	
4.5.2: Construction and operation of the project alternatives would not deplete local groundwater supplies or interfere with groundwater recharge.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.5.3: Project alternatives would not substantially alter drainage patterns but reservoir expansion would increase the reservoir shoreline area subject to erosion.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.5.4: Project alternatives would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff during operation.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.5.2:** CCWD shall design facilities with introduced impervious surfaces with stormwater control measures that are consistent with the Regional Water Quality Control Board's NPDES municipal stormwater runoff requirements. The stormwater control measures shall be designed and implemented to reduce the discharge of stormwater pollutants to the maximum extent practical. Stormwater controls such as bioretention facilities, flow-through planters, detention basins, vegetative swales, covering pollutant sources, oil/water separators, retention ponds, shall be designed to control stormwater quality to the maximum extent practical. In addition, CCWD shall prepare and implement a Stormwater Facility Operation and Management Plan that assigns responsibility for maintenance of stormwater facilities for the life of the project.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.5: Local Hydrology, Drainage and Water Quality (continued)				
4.5.5: Project Alternatives 1, 2, and 3 could place structures within a 100-year flood hazard area as mapped on a federal Flood Insurance Rate Map, which could impede or redirect flood flows.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.5.6: The project alternatives would not substantially increase the exposure of people and/or structures to risks associated with inundation by dam or levee failure.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.5.7: Construction and operation of the project alternatives would not make a cumulatively considerable contribution to cumulative effects on drainage, flooding, groundwater recharge or water quality degradation in the project area.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.6: Biological Resources				
4.6.1: Project construction would affect the following NCCP habitat types (CDFG sensitive plant communities in parentheses): Natural Seasonal Wetland (i.e., bulrush-cattail series, northern claypan vernal pool, bush seepweed and saltgrass series), Valley/Foothill Riparian (i.e., Fremont cottonwood series and valley oak series), Grassland (i.e., purple needlegrass series) and Valley/Foothill Woodland Forest (i.e., blue oak series).	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	The distribution and extent of sensitive plant communities has been mapped and documented for all project facilities, both within and outside the watershed. Mitigation Measures 4.6.1a and 4.6.1b include sensitive resource avoidance, impact minimization, restoration of temporarily disturbed sensitive plant communities, and compensation for permanent, unavoidable losses through restoration, enhancement, creation, and preservation; implementation of these measures would reduce the impacts on sensitive plant communities from construction of all facilities to a less-than-significant level. Compensation measures presented in this section have been integrated into a comprehensive biological resources mitigation and compensation program, which is presented in Section 4.6.3. **Measure 4.6.1a:** Based on the documented distribution of sensitive plant communities, CCWD shall implement avoidance and minimization measures to minimize impacts on sensitive plant communities during project construction. To the extent feasible, project design shall minimize impacts on sensitive plant communities. Exclusion and/or silt fencing shall be installed to buffer avoided areas. Natural Seasonal Wetland habitat (bush seepweed) shall be avoided within the Western substation study area by siting facilities to avoid to this plant community.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.1 continued)			**Measure 4.6.1b:** Where avoidance of sensitive plant communities is not possible, CCWD shall provide compensation through habitat creation, enhancement, and preservation, both within and outside the watershed, for temporary and permanent impacts on the following sensitive plant communities that will be affected by the project: *Natural Seasonal Wetland (Bulrush-cattail Series, Northern Claypan Vernal Pool, Bush Seepweed, and Saltgrass Series)* • CCWD shall implement Mitigation Measure 4.6.2, presented below, to minimize, and compensate for impacts to sensitive plant communities associated with jurisdictional wetlands and other waters of the United States. *Valley Oak, Blue Oak Woodlands, and Fremont Cottonwood Series* • CCWD shall develop an oak woodland mitigation and monitoring plan to outline mitigation and monitoring obligations for impacts resulting from increased reservoir levels and construction activities. This plan shall include restoration, enhancement, and/or preservation sites; thresholds of success; monitoring and reporting requirements; site-specific designs for site restoration/enhancement activities; and long-term maintenance activities as set forth in the following bullets. • Under the oak woodland mitigation and monitoring plan, CCWD shall acquire or dedicate land suitable for blue oak woodland and riparian woodland (valley oak and Fremont cottonwood series) restoration, enhancement, and preservation. If restoration is feasible, then a ratio of at least 2:1 shall be used. If preservation (with enhancement) is used, at least a 3:1 ratio shall be implemented to offset losses. • Due to the limited availability of suitable mitigation lands in the watershed, CCWD shall purchase blue oak mitigation lands outside of the watershed. • CCWD shall coordinate acquisition of woodland mitigation lands with USFWS to minimize potential conflicts with regional San Joaquin kit fox planning efforts, which seek to maintain open grasslands movement corridors. • CCWD shall submit the mitigation and monitoring plan to the appropriate regulatory agencies for approval.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.1 continued)			*Purple Needlegrass Grasslands* • CCWD shall seed disturbed areas within this habitat area with native grass seed collected within or in the vicinity of impacts. Additional seed could be used to supplement seed mixes, but seed shall be from locally collected (within the ecoregion) source material and shall be appropriately selected for site conditions. • Consistent with MSCS guidance (CALFED, 2000) and coordination with CDFG and USFWS, mitigation for loss of this plant community shall be provided by preservation and enhancement of mitigation lands at a minimum of a 2:1 mitigation ratio to compensate for permanent losses. • CCWD shall develop and implement a native grassland restoration and enhancement plan to identify potential seed collection sites, quantities of seed required, potential enhancement areas within the Los Vaqueros Watershed, potential enhancement activities, and other measures required to maintain the sustainability of native grassland restoration and enhancement areas.	
4.6.2: Project construction could affect potentially jurisdictional wetlands or waters, and streambeds and banks regulated by CDFG.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.6.2a:** Final project design shall avoid and minimize the fill of wetlands and other waters to the greatest practicable extent. Areas that are avoided shall be subject to best management practices under the General National Pollutant Discharge Elimination System Permit, as described in Measure 4.5.1. The fill of wetlands at the proposed Western substation site shall be avoided by siting facilities within the study area so as to avoid impacts to such areas. **Measure 4.6.2b:** Where jurisdictional wetlands and other waters cannot be avoided, to offset temporary and permanent impacts that would occur as a result of the project, restoration and compensatory mitigation shall be provided through the following mechanisms: 1. Purchase or dedication of land to provide wetland preservation, restoration or creation. If restoration is available and feasible, then a ratio of at least 2:1 shall be used. If a wetland needs to be created, at least a 3:1 ratio shall be implemented to offset losses. Where practical and feasible, onsite mitigation shall be implemented.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.2 continued)			2. A wetland mitigation and monitoring plan shall be developed by a qualified biologist in coordination with CDFG, USFWS, USACE, and/or RWQCB that details mitigation and monitoring obligations for temporary and permanent impacts to wetlands and other waters as a result of construction activities. The plan shall quantify the total acreage lost, describe mitigation ratios for lost habitat, annual success criteria, mitigation sites, monitoring and reporting requirements, and site specific plans to compensate for wetland losses resulting from the project. 3. The mitigation and monitoring plan shall be submitted to the appropriate regulatory agencies for approval.	
4.6.3: Project construction could affect populations of special-status plant species including brittlescale, San Joaquin spearscale, Brewer's dwarf-flax, and rose-mallow.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM NI	Mitigation Measures 4.6.3a and 4.6.3b include focused plant surveys coupled with avoidance and minimization of impacts; harvesting, transplanting, and long-term maintenance of affected individuals; and the establishment of permanent mitigation sites that provide the specific habitat needs for each affected species. Implementation of these mitigation measures would reduce the impacts on special-status plant species to a less-than-significant level. **Measure 4.6.3a:** Where necessary (see Figures 4.6-12 and 13), CCWD shall complete focused plant surveys on out-of-watershed pipeline alignments and facilities following CDFG and USFWS special-status plant survey guidelines. Comprehensive special-status plant surveys have been completed, except at a few sites on the Transfer-Bethany Pipeline alignment, within the Western substation siting zone (Power Option 1), and within the Western powerline alignment associated with Power Option 2 (i.e., within the siting zone for the new Western substation described above) and 2) and north of the Skinner Delta Fish Protective Facility (Power Option 2). Surveys shall document the location, extent, and size of Atriplex (brittlescale and heartscale) populations, if present, and shall be used to inform the planned avoidance of rare plant populations whenever possible. The Western substation shall be sited within the Western substation study area so as to avoid and minimize impacts to San Joaquin spearscale. To the extent feasible, the final project design shall minimize impacts on known special-status plant populations within and next to the construction footprints. CCWD and its contractors will design facilities to avoid sensitive plant populations whenever feasible, and shall install exclusion fencing and/or silt fencing around sensitive plant populations with as large a buffer as possible to minimize the potential for direct and indirect impacts such as fugitive dust and accidental intrusion into sensitive areas. Dust and erosion control measures are described in Measure 4.5.1.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.3 continued)			**Measure 4.6.3b:** Where avoidance is not feasible, CCWD shall compensate for the loss of special-status plants through the following steps: • A qualified ecologist shall develop and implement a restoration and mitigation plan according to CDFG guidelines and in coordination with CDFG and USFWS. At a minimum, the plan shall include collection of reproductive structures from affected plants, a full description of microhabitat conditions necessary for each affected species, seed germination requirements, restoration techniques for temporarily disturbed occurrences, assessments of potential transplant and enhancement sites, success and performance criteria, and monitoring programs, as well as measures to ensure long-term sustainability. The mitigation plan shall apply to portions of the Los Vaqueros Watershed, portions of Transfer-Bethany Pipeline that require vernal pool restoration (i.e., near Byron Airport), and areas that support rose-mallow on the banks of Old River. • Land that supports known populations of affected special-status plants shall be identified, enhanced, and protected within the watershed or acquired outside of the watershed at a ratio of 1.1:1 and protected in perpetuity with conservation easements.	
4.6.4: Project construction would result in impacts on California red-legged frog and California tiger salamander, including aquatic breeding habitat and upland aestivation habitat for these species.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	The implementation of Measure 4.6.4a, which includes measures to avoid and minimize take of individual frogs and salamanders, and Measure 4.6.4b, which provides for habitat compensation and enhancement, would reduce the impacts on California red-legged frogs and California tiger salamanders to a less-than-significant level. **Measure 4.6.4a:** CCWD shall implement measures to minimize and avoid take of California red-legged frogs and California tiger salamanders. Before and during construction, the following actions shall minimize impacts on these species: • CCWD shall submit the name and credentials of a biologist qualified to act as construction monitor to USFWS for approval at least 15 days before construction work begins. General minimum qualifications are a 4-year degree in biological sciences or other appropriate training and/or experience in surveying, identifying, and handling California tiger salamanders and California red-legged frogs. • A USFWS-approved biologist shall survey the work sites 2 weeks before the onset of construction. If California tiger salamanders or California red-legged frogs (or their tadpoles or eggs) are found, the approved	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.4 continued)			biologist shall contact USFWS to determine whether moving any of these life-stages is appropriate. If USFWS approves moving the animals, the approved biologist shall be allowed sufficient time to move frogs and/or salamanders from the work sites before work begins. If these species are not identified, construction can proceed at these sites. The approved biologist shall use professional judgment to determine whether (and if so, when) the California tiger salamanders and/or California red-legged frogs are to be moved. The USFWS-approved biologist shall immediately inform the construction manager that work should be halted, if necessary, to avert avoidable take of listed species. • Areas will be monitored during construction to identify, capture, and relocate sensitive amphibians, if present. • A detailed California red-legged frog/California tiger salamander relocation plan will be prepared at least 3 weeks before the start of groundbreaking, and submitted to USFWS for review. The purpose of the plan is to standardize amphibian relocation methods and relocation sites. • A USFWS-approved biologist shall be present at the active work sites until California red-legged frogs and California tiger salamanders have been removed, and habitat disturbance has been completed. Thereafter, the contractor or CCWD shall designate a person to monitor onsite compliance with all minimization measures. A USFWS-approved biologist shall ensure that this individual receives training consistent with USFWS requirements. • CCWD and its contractors shall initiate all work within potential California red-legged frog aquatic breeding habitat between May 1 and November 1 (i.e., generally identified as the nonbreeding season). Project construction timing constraints are summarized in Section 4.6.3. • CCWD and its contractors shall install frog-exclusion fencing (i.e., silt fences) around all construction areas that are within 100 feet of potential California red-legged frog or California tiger salamander aquatic breeding habitat. • A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and California tiger	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.4 continued)			salamander and their habitat, the importance of these species and their habitat, the general measures that are being implemented to conserve the red-legged frog and tiger salamander as they relate to the project, and the boundaries within which the project construction shall occur. • During work activities, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. After construction, the contractor shall remove all trash and construction debris from work areas on a daily basis. • All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 20 meters (65.6 feet) from any riparian habitat or water body. • Before the onset of work, CCWD shall prepare a stormwater pollution prevention plan and water pollution control plan as described in Measures 4.5.1a and 4.5.1b to allow prompt and effective response to any accidental spills. • Before construction begins, CCWD shall prepare a plan describing pre-project conditions, restoration, and monitoring success criteria. CCWD or its contractors shall restore the contours and revegetate all areas disturbed by the project with an appropriate assemblage of native vegetation suitable to the area. • Where needed to maintain California red-legged frog and/or California tiger salamander breeding in existing mitigation wetlands that are presently supplemented with water, but are not directly disrupted by construction, CCWD shall continue to provide supplemental water to these ponds during and after construction according to the existing terms and conditions for these mitigation sites. **Measure 4.6.4b:** CCWD shall provide compensation for permanent and temporary impacts on California tiger salamander and California red-legged frog aquatic habitat. In accordance with MSCS (CALFED, 2000) objectives, CCWD shall provide compensation for the permanent loss of California red-legged frog and California tiger salamander aquatic habitat at a minimum of a 3:1 ratio. The MSCS does not require compensation for loss of California red-legged frog and California tiger salamander aestivation habitat. To satisfy compensation guidelines, CCWD shall implement the following measures:	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.4 continued)			• CCWD shall mitigate for the loss of aquatic breeding sites that will be filled or otherwise directly affected by the project (estimated to be 16 sites at this time; number to be confirmed by pre-construction surveys) as well as mitigate for impacts on associated California red-legged frog upland habitat by providing compensatory habitat. • CCWD shall develop and implement a mitigation, monitoring, and management plan, with input from regulatory agencies that shall outline long-term management strategies and performance standards to be attained to compensate for habitat losses resulting from the project. At a minimum, the plan shall include standards for mitigation site selection and construction specifications for mitigation sites, a description of site conditions including aerial maps, an analysis of local amphibian habitat (e.g., is another breeding habitat nearby?), and performance criteria by which site quality can be assessed over time (see below). A monitoring program shall be established to track the development of habitat conditions that are conducive to the establishment of the California red-legged frog and/or California tiger salamander breeding populations. Long-term monitoring (e.g., night surveys and aquatic dipnet surveys) shall be performed on an annual basis to determine if these species are present. The plan shall provide that monitoring be performed to ensure that mitigation ponds that are dependent upon artificial water function as designed. • Performance criteria shall be used to assess the success of aquatic habitat created for California red-legged frogs and California tiger salamander aquatic habitat. These criteria shall be outlined in the mitigation, monitoring and management plan and shall include: - A description of the type of habitat to be created (e.g., permanent marsh consisting of open water and emergent vegetation; semipermanent marsh); - The total area, size and number of California red-legged frog and California tiger salamander mitigation ponds to be created based on a comparable loss of breeding sites (e.g., 1:1 replacement ratio) as a result of the project. These ponds shall concurrently satisfy wetland mitigation requirements identified in Measure 4.6.2b;	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.4 continued)			- Constructed permanent marsh ponds that are designed to support California red-legged frog breeding shall provide: ▪ at least 75% absolute vegetation cover of wetland plant species within shallow water emergent vegetation zones; ▪ year-round inundation with depths of at least 1.5 feet in the vegetation zone and 4 feet in open water. - Constructed semipermanent marsh ponds that are designed to support California tiger salamander or California red-legged frog breeding habitat shall provide: ▪ water regimes similar to affected features, with semi-permanent water ranging from depths of 1.5 to 2.5 feet or greater during a typical rainfall year and an inundation period that exceeds 120 consecutive days; a predominance of seasonal wetland plants (at least 75% absolute vegetation cover) during the winter/spring monitoring period (though may support upland species later in the year when pools dry). • To the greatest practicable extent, CCWD or its contractors shall construct and manage compensation habitat (i.e., replacement ponds) for California red-legged frogs and California tiger salamanders prior to project implementation. A qualified biologist shall ensure that ponds are functioning before the removal and/or inundation of existing California tiger salamander and California red-legged frog aquatic breeding sites. • Construction within the Kellogg Creek corridor (i.e., creek crossing sites) shall be designed to impact the smallest area required to provide for the installation of pipelines, particularly in the area below Los Vaqueros Dam. • CCWD and its contractors shall restore and enhance Kellogg Creek and adjacent natural upland environs in the project area (about 4.0 linear miles) to restore suitable aquatic breeding habitat for California red-legged frogs and restore disturbed upland areas as close as possible to pre-project conditions. Methods of enhancement and restoration could include, but are not limited to, reducing erosion; installing breeding ponds; excluding cattle from sensitive areas; and managing, salvaging, and seeding with grasses, forbs, and other species that are native to the site, as well as other measures to increase water quality within the enhancement and restoration reach.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.4 continued)			New mitigation ponds that are created for California red-legged frog and California tiger salamander shall be hydrologically self-sustaining and shall not require a supplemental water supply. Because few natural drainages in the Los Vaqueros Watershed could maintain self-sustaining mitigation ponds, a portion of the pond mitigation locations will likely be identified outside of the watershed.	
4.6.5: Project construction would result in direct and indirect impacts on existing populations of and habitat for the western pond turtle.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	The implementation of Mitigation Measure 4.6.5, which includes biological monitoring and turtle relocation, would reduce project impacts on western pond turtle populations and habitat to a less-than-significant level: **Measure 4.6.5:** Before construction activities begin, a qualified biologist shall conduct western pond turtle surveys within creeks and in other ponded areas affected by the project. Upland areas shall also be examined for evidence of nests as well as individual turtles. The project biologist shall be responsible for the survey and for the relocation of turtles. Construction shall not proceed until a reasonable effort has been made to capture and relocate as many western pond turtles as possible to minimize take. However, some individuals may be undetected or enter sites after surveys, and would be subject to mortality. If a nest is observed, a biologist with the appropriate permits and prior approval from CDFG shall move eggs to a suitable location or facility for incubation, and release hatchlings into the creek system the following autumn. In addition, western pond turtles shall be included in the fish rescue operation described in Mitigation Measure 4.3.3 (Alternatives 1 and 2 only).	No Impact Less Than Significant
4.6.6: Project construction under Alternatives 1, 2, and 3 would result in direct and indirect impacts on listed vernal pool fairy shrimp and their habitat, and on the non-listed midvalley fairy shrimp and curved-foot hygrotus diving beetle.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM NI	The measures proposed below would mitigate impacts to both vernal pool fairy shrimp and midvalley fairy shrimp to a less-than-significant level. The implementation of Measure 4.6.4b, which provides compensation for temporary and permanent impacts to sensitive amphibian habitat in seasonal ponds, would reduce impacts to curved-foot hygrotus diving beetles to a less-than-significant level. **Measure 4.6.6a:** CCWD shall assume the presence of listed vernal pool branchiopods in all suitable habitat for which CCWD chooses not to perform protocol-level surveys. Preliminary branchiopod surveys (ESA, 2008a) have documented the general distribution of and habitat for vernal pool fairy shrimp in the project area. Longhorn fairy shrimp are	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.6 continued)			not expected in the project areas based on this species' narrow habitat requirements, restricted range, and available habitat. CCWD shall minimize impacts on listed vernal pool branchiopods. To avoid and minimize direct and indirect impacts on listed vernal pool branchiopods, standard water quality protection measures shall be implemented as established in Mitigation Measure 4.5.1. Additional measures to minimize and avoid habitat for listed vernal pool branchiopods shall be implemented as required by USFWS and include: • Avoidance of potential habitat by narrowing work corridors near potential vernal pool branchiopod habitat to the greatest extent practicable. • Establishment of 250-foot buffers around potential branchiopod habitat, which is a typical avoidance distance that is recommended by the USFWS to minimize and avoid direct and indirect impacts. For the Kellogg Creek vernal pool complex the following protection measures shall be implemented: • Land uses in the easternmost portion of the Los Vaqueros Watershed shall remain restricted to activities associated with wind energy generation, dry-land farming, grazing, and administration by CCWD. • East of Los Vaqueros Reservoir, public access shall be restricted from CDFG conservation easement lands at the Kellogg Creek vernal pool complex and lands within 500 feet. Public access shall be restricted to research and occasional educational activities conducted under the supervision of CCWD staff or other designated land management agencies. • The eastside trail and other public access trails located in proximity to the vernal pool complex shall be 500 feet or farther from the CDFG conservation easement and beyond direct line of sight to rock outcrop features. • The eastern boundary of the public access area shall be fenced to prevent human access to the vernal pool complex and this fence and the Kellogg Creek vernal pools area shall be patrolled to ensure that no trespassing happens and that the fence remains intact.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.6 continued)			• Before opening the eastside trail to public access, a biological evaluation shall be prepared by CCWD that establishes baseline environmental conditions at the vernal pool complex. Elements to be assessed include signs of trespass (e.g., trash, fires, site trampling, wear marks, rocks or other features in pools, or bicycle tire tracks), an evaluation of water quality during winter months to include at a minimum total dissolved solids, pH, and alkalinity, and documentation of any site damage. These conditions will be used as a basis for later site evaluations. An assessment of branchiopod populations shall also be provided as a component of the baseline evaluation. • If excessive trespass, defined here as noticeable site deterioration relative to baseline conditions, is identified at the vernal pool complex CCWD shall immediately coordinate with USFWS. If site damage is identified, corrective remedies shall be implemented to prevent further harm to the complex. Such actions may include removing trash or debris from the complex, closing portions of the eastside trail to public access, enhancing site fencing, or other remedies to prevent trespass. • While the eastside trail remains open to public access, annual reports shall be prepared to document site conditions relative to baseline conditions. • Permanent signage shall be installed within 50 feet of the Kellogg Creek vernal pool complex (or on the surrounding fence) that specifies that, "This area is habitat of the vernal pool fairy shrimp, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." • A USFWS-approved construction monitor shall be present during construction within 0.5 mile of the Kellogg Creek vernal pool complex, as identified in the 1995 BO (USFWS, 1995). **Measure 4.6.6b:** CCWD shall mitigate for impacts to vernal pool fairy shrimp habitat through one or more of the following steps to provide compensatory habitat: (a) salvage of cysts and creation of replacement pool habitat in the local area at a replacement ratio of at least 3:1, (b) restoration of affected pools onsite after construction completion, or (c) acquisition of credits from a local mitigation bank(s).	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.6 continued)			To mitigate for the loss of aquatic sites on the Delta-Transfer Pipeline and Transfer-Bethany Pipeline alignments where vernal pool branchiopods are presumed present, CCWD shall implement the following measures: • CCWD shall mitigate for the loss of branchiopod habitat that will be filled or otherwise directly affected by the project (estimated to be 17 pools) by providing compensatory habitat. • For portions of the Transfer-Bethany Pipeline alignment near Byron Airport (e.g., adjacent to Wildlands' Byron Conservation Bank and Contra Costa County lands at Byron Airport) that support vernal pools, CCWD shall conduct a preconstruction land survey of the pipeline construction area to document current conditions of topography and existing drainage patterns, and to document shallow soil lithology within the construction area footprint as a baseline for restoring vernal pool hydrology following construction. In areas where claypan soils are encountered within critical habitat for vernal pool fairy shrimp (and Contra Costa goldfields) the upper clay soil layer shall be locally stockpiled and reestablished in place following pipeline installation. Upon completion of construction activities, final grading shall be completed to maintain surface flow conditions, local hydrology and similar compaction of surface soils to that of the documented current conditions prior to construction activities. • CCWD shall develop and implement a mitigation, monitoring, and management plan, with input from regulatory agencies that shall outline long-term management strategies and performance standards to be attained to compensate for habitat losses resulting from the project. At a minimum, the plan shall include standards for mitigation site selection and construction specifications for mitigation sites, a description of site conditions including aerial maps, an analysis of local branchiopod habitat, and performance criteria by which site quality can be assessed over time (e.g., size, vegetation species present, date of initial ponding, ponding duration, and wildlife usage). A monitoring program will be established to track the development of habitat conditions that are conducive to the establishment of vernal pool branchiopods. • To the greatest practicable extent, CCWD or its contractors shall construct compensation habitat (i.e., replacement pools) before habitat disturbances are incurred; or directly within the project footprint after construction. A qualified biologist shall ensure that ponds are functioning as designed.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.6 continued)			• CCWD shall submit the name and credentials of a biologist qualified to act as construction monitor to USFWS for approval at least 15 days before construction work begins. • With concurrence from the USFWS, a USFWS-approved biologist shall salvage soils from sites that are known to support vernal pool branchiopods at least 2 weeks before the onset of construction, or during the preceding dry season if pools are anticipated to hold water when construction begins. The salvaged soil samples will be stored and used to inoculate created pools once minimum performance standards are met at these locations. • A USFWS-approved biologist shall be present at each active work site within 0.5 mile of potential fairy shrimp habitat until habitat disturbance has been completed. Thereafter, the contractor or CCWD shall designate a person to monitor onsite compliance with all minimization measures. A USFWS-approved biologist shall ensure that this individual receives training consistent with USFWS requirements. • A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the vernal pool fairy shrimp and their habitat, the importance of these species and their habitat, the general measures that are being implemented to conserve fairy shrimp as they relate to the project, and the boundaries within which the project construction shall occur. • All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 100 feet from any fairy shrimp habitat.	
4.6.7: Project construction would have temporary and permanent impacts on potential San Joaquin kit fox habitat and permanently reduce potential regional movement opportunities in one location for this species.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM/SU LSM/SU LSM/SU LSM/SU	**Measure 4.6.7a:** CCWD shall implement San Joaquin kit fox protection measures. The following measures, which are intended to reduce direct and indirect project impacts on San Joaquin kit foxes, are derived from the San Joaquin Kit Fox Survey Protocol for the Northern Range (USFWS, 1999a) and the Standardized Recommendations for Protection of the San Joaquin Kit Fox (USFWS, 1999b). These measures shall be implemented for construction areas along pipeline corridors, staging areas, and facilities within the watershed: • Preconstruction surveys shall be conducted within 200 feet of work areas to identify potential San Joaquin kit fox dens or other refugia in and surrounding workstations. A qualified biologist shall conduct the	No Impact Less than significant for habitat impacts except loss of the potential movement corridor on the western side of the reservoir, which would remain a significant and unavoidable effect of the project under all project alternatives. Although the proposed mitigation program includes acquisition of habitat acres to compensate for the grassland acres

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.7 continued)			survey for potential kit fox dens 14 to 30 days before construction begins. All identified potential dens shall be monitored for evidence of kit fox use by placing an inert tracking medium at den entrances and monitoring for at least 3 consecutive nights. If no activity is detected at these den sites, they shall be closed following guidance established in USFWS Standardized Recommendations document. • If kit fox occupancy is determined at a given site, the construction manager should be immediately informed that work should be halted within 200 feet of the den and the USFWS contacted. Depending on the den type, reasonable and prudent measures to avoid effects to kit foxes could include seasonal limitations on project construction at the site (i.e., restricting the construction period to avoid spring-summer pupping season), and/or establishing a construction exclusion zone around the identified site, or resurveying the den a week later to determine species presence or absence. • To minimize the possibility of inadvertent kit fox mortality, project-related vehicles shall observe a maximum 20 miles per hour speed limit on private roads in kit fox habitat. Nighttime vehicle traffic shall be kept to a minimum on nonmaintained roads. Off-road traffic outside the designated project area shall be prohibited in areas of kit fox habitat. • To prevent accidental entrapment of kit fox or other animals during construction, all excavated holes or trenches greater than 2 feet deep shall be covered at the end of each work day by suitable materials, fenced, or escape routes constructed of earthen materials or wooden planks shall be provided. Before filling, such holes shall be thoroughly inspected for trapped animals. • All food-related trash items (such as wrappers, cans, bottles, and food scraps) shall be disposed of in closed containers and removed daily from the project area. • To prevent harassment and mortality of kit foxes or destruction of their dens, no pets shall be allowed in the project area. **Measure 4.6.7b:** To compensate for impacts on San Joaquin kit fox habitat outside of dedicated CDFG conservation easements, CCWD shall provide mitigation either through acquiring and dedicating lands into conservation easements or purchasing mitigation credits at compensation ratios that have been approved by state and federal resource agencies.	affected by reservoir expansion, and the program also proposes acquisition of compensatory habitat in areas that preserve remaining movement corridors for the kit fox, these measures would not reduce or avoid the loss of the grassland along the western side of the reservoir. The loss of most of this grassland strip to inundation and therefore of this specific potential movement corridor is unavoidable.

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.7 continued)			Consistent with MSCS and USFWS guidance, mitigation ratios applied for impacts on San Joaquin kit fox habitat shall be 1:1 to 1.1:1 for temporary impacts; 1:1 to 2:1 for long-term temporary impacts; and 1:1 to 3:1 for permanent impacts. CCWD shall acquire San Joaquin kit fox mitigation lands based on anticipated impacts to suitable habitat and mitigation ratios identified by the MSCS and USFWS (see Table 4.6-14). San Joaquin kit fox mitigation obligations may concurrently satisfy burrowing owl mitigation obligations identified in Mitigation Measure 4.6.8, below, if suitable habitat is present for both species in mitigation lands. The availability of mitigation lands to satisfy mitigation requirements for these species is discussed in the Comprehensive Biological Resources Mitigation and Compensation Program (Section 4.6.3). **Measure 4.6.7c:** CCWD shall replace any acreage of existing kit fox easement affected by the project with an equivalent amount of acreage within the watershed to maintain under conservation easement the full amount required for the original Los Vaqueros Reservoir Expansion Project. In addition, CCWD shall provide compensation for conservation easement acreage affected at a ratio of up to 3:1, including conservation easement lands that are isolated by the project (see Table 4.6-14). Compensation for temporary impacts to lands within conservation easements shall be provided at a ratio of 1:1 to 1.1:1.	
4.6.8: Project construction would result in temporary and permanent loss of habitat for burrowing owls.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	The implementation of Mitigation Measure 4.6.8a, which requires preconstruction surveys and protection measures to avoid burrowing owls during the breeding season, and Measure 4.6.8b, which includes the establishment of mitigation lands for loss of habitat as required by regulatory permits, would reduce potential impacts on burrowing owls to a less-than-significant level. **Measure 4.6.8a:** CCWD shall implement the measures listed below for grassland habitats to reduce potential impacts to a less-than-significant-level and to avoid incidental take of burrowing owls. In advance of construction, CCWD shall follow the current CDFG burrowing owl survey guidance, presently the Burrowing Owl Consortium multi-phase approach to evaluate burrowing owl use. Measures shall apply to all construction activities near active nests or within potential burrowing owl nesting habitat, to avoid, minimize, or mitigate impacts on burrowing owls: *Breeding season surveys* shall be performed to determine the presence of burrowing owls for the purposes of inventory, monitoring, avoidance of take,	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.8 continued)			and determining appropriate mitigation. In California the breeding season begins as early as February 1 and continues through August 31. Under the Burrowing Owl Consortium's multi-phase survey methodology, for areas within 500 feet of construction boundaries, CCWD shall: 1) perform a habitat assessment to identify essential components of burrowing owl habitat, including artificial nest features; 2) perform intensive burrow surveys in areas that are identified to provide suitable burrowing owl habitat, and; 3) perform at least four appropriately-timed breeding season surveys (four survey visits spread evenly [roughly every 3 weeks] during the peak of the breeding season, from April 15 to July 15) to document habitat use. *Pre-construction surveys* shall be used to assess the owl presence before site modification is scheduled to begin. Initial pre-construction surveys should be conducted outside of the owl breeding season (February 1–August 31), but as close as possible to the date that ground-disturbing activities will begin. Generally, initial pre-construction surveys should be conducted within 7 days, but no more than 30 days prior to ground-disturbing activities. Additional surveys may be required when the initial disturbance is followed by periods of inactivity or the development is phased spatially and/or temporally over the project area. Up to four or more survey visits performed on separate days may be required to assure with a high degree of certainty that site modification and grading will not take owls. The full extent of the pre-construction survey effort shall be described and mapped in detail (e.g., dates, time periods, area[s] covered, and methods employed) in a biological report that will provided for review to CDFG. In addition to the above survey requirements, the following measures shall be implemented to reduce project impacts to burrowing owls: • Construction exclusion areas (e.g., orange exclusion fence or signage) shall be established around occupied burrows, where no disturbance shall be allowed. During the nonbreeding season (September 1 through January 31), the exclusion zone shall extend at least 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas shall extend 250 feet around occupied burrows (or farther if warranted to avoid nest abandonment). • If work or exclusion areas conflict with owl burrows, passive relocation of onsite owls could be implemented as an alternative, but only during the nonbreeding season and only with CDFG approval. The approach to owl relocation and burrow closure will vary depending on the number of	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.8 continued)			occupied burrows. Passive relocation shall be accomplished by installing one-way doors on the entrances of burrows within 160 feet of the project area. The one-way doors shall be left in place for 48 hours to ensure the owls have left the burrow. The burrows shall then be excavated with a qualified biologist present. Construction shall not proceed until the project area is deemed free of owls. • Unoccupied burrows within the immediate construction area shall be excavated using hand tools, and then filled to prevent reoccupation. If any burrowing owls are discovered during the excavation, the excavation shall cease and the owl shall be allowed to escape. Excavation could be completed when the biological monitor confirms the burrow is empty. • Artificial nesting burrows will be provided as a temporary measure when natural burrows are lacking. To compensate for lost nest burrows, artificial burrows shall be provided outside the 160-foot buffer zone (CDFG, 1995). The alternate burrows shall be monitored daily for 7 days to confirm that the owls have moved in and acclimated to the new burrow. **Measure 4.6.8b:** CCWD shall compensate for permanent habitat losses at a minimum 2:1 ratio (possibly concurrent with other mitigation commitments, such as those for San Joaquin kit fox, provided habitat is present for both species). Compensation could consist of purchasing and enhancing suitable habitat, converting it to a conservation easement, and conveying the easement to a managing agency or institution in perpetuity; participating in a resource agency-approved mitigation bank that provides offset mitigation credits for loss of burrowing owl habitat; or a combination of both. Burrowing owl mitigation areas shall support burrowing owl populations in similar or greater densities to those on impacted burrowing owl habitat.	
4.6.9: Project construction and operation activities would result in direct and indirect impacts on existing populations of and habitat for the golden eagle, bald eagle, and Swainson's hawk.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM/B (bald eagle) LSM/B (bald eagle) LSM/B (bald eagle) LSM/B (bald eagle)	Implementation of Mitigation Measures 4.6.9a (for all three species) and 4.6.9b (for golden eagle and Swainson's hawks) would reduce potential impacts associated with project construction to a less-than-significant level. **Measure 4.6.9a:** CCWD shall ensure that nesting golden eagles, bald eagles, and Swainson's hawks are protected. The following measures address potential impacts on nesting golden eagles and Swainson's hawks in the project vicinity. Measures that pertain to golden eagles and their nests would apply to nesting bald eagles, were they found in the Los Vaqueros Watershed prior to construction.	No Impact Less Than Significant Beneficial –Bald Eagle

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.9 continued)			• Whenever feasible, construction near recently active nest sites shall start outside the active nesting season. The nesting period for golden eagles is between March 1 and August 15. Bald eagles and Swainson's hawks nest between March 15 and August 15. • If groundbreaking activities begin during the nesting period, a qualified biologist shall perform a preconstruction survey 14 to 30 days before the start of each new construction phase to search for golden eagle and Swainson's hawk nest sites within 0.5 mile of proposed activities. If active nests are not identified, no further action is required and construction may proceed. If active nests are identified, the avoidance guidelines identified below shall be implemented. • For golden eagles, construction contractors shall observe CDFG avoidance guidelines, which stipulate a minimum 500-foot buffer zone around active golden eagle nests. Buffer zones shall remain until young have fledged. For activities conducted with agency approval within this buffer zone, a qualified biologist shall monitor construction activities and the eagle nest(s) to monitor eagle reactions to activities. If activities are deemed to have a negative effect on nesting eagles, the biologist shall immediately inform the construction manager that work should be halted, and CDFG will be consulted. The resource agencies do not issue take authorization for this species. • If construction begins during the Swainson's hawk nesting period, a qualified biologist shall conduct preconstruction surveys at least 2 weeks prior to construction following CDFG guidance (e.g., CDFG, 2000) in areas that potentially provide nesting opportunities to verify species presence or absence. If the survey indicates presence of nesting Swainson's hawks within a 0.5-mile radius, the results shall be coordinated with CDFG to develop and implement suitable avoidance measures that include construction buffers and nest monitoring. • Consistent with the Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (CDFG, 1994), mitigation shall include the following approach: - No intensive new disturbances or other project-related activities that could cause nest abandonment or forced fledging shall be initiated within 0.25 mile (buffer zone) of an active nest between March 15 and September 15.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.9 continued)			- Nest trees shall not be removed unless no feasible avoidance exists. If a nest tree must be removed, CCWD shall obtain a management authorization (including conditions to offset the loss of the nest tree) from CDFG. The tree removal period specified in the management authorization is generally between October 1 and February 1. - Monitoring of the nest by a qualified biologist may be required if the project-related activity has the potential to adversely impact the nest. • CDFG often allows construction activities that are initiated outside the nesting season to continue without cessation even if raptors such as golden eagles choose to nest within 500 feet of work activities. Thus, work at the dam construction site may continue without delay if surveys verify the local absence of nesting golden eagles, or if groundbreaking begins outside the nesting period (August 16 through February 28). • After construction, CCWD shall survey for and monitor golden eagle and bald eagle nesting sites in the Los Vaqueros Watershed to ensure that recreational activity and other beneficial uses of the watershed do not disrupt eagle nest sites. Surveys will be performed at the beginning of the nesting season and continue through the nesting season. Consistent with present policy, recreational access and other disruptive activities will be suspended within 500 feet of active eagle nests until the young eagles have fledged. **Measure 4.6.9b:** CCWD shall acquire and/or restore foraging habitat for Swainson's hawks and golden eagles in accordance with CALFED and CDFG guidelines, set forth in Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (CDFG, 1994), as follows: • Compensate for permanent foraging habitat losses (e.g., agricultural lands and annual grasslands) within 1 mile of active Swainson's hawk nests (acreage to be determined during preconstruction surveys) at a ratio of 1 acre of mitigation lands for each acre of permanent development (i.e., 1:1 replacement ratio). Foraging habitat impacts will be largely limited to valve structures (roughly 10-foot square) every few hundred feet along pipeline routes, with less than an acre of anticipated foraging habitat loss. • Consistent with MSCS guidance, impacts to golden eagle foraging habitat will be provided by enhancing or restoring foraging habitat at ratio from ratio of 1:1 to 5:1.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
4.6.10: Project construction and increased reservoir water levels would result in temporary and permanent loss of potential and occupied habitat for Alameda whipsnakes.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.6.10a:** CCWD shall minimize and/or avoid construction-related impacts on Alameda whipsnakes through the development and implementation of an Alameda whipsnake protection and monitoring plan. USFWS shall approve this plan during formal consultation under FESA Section 7, and shall establish a program of preconstruction surveys and construction supervision to identify and prevent potential hazards to individual Alameda whipsnakes that could be present during construction. The plan shall prohibit or restrict activities that could harm or harass this species. Habitat restoration and compensation shall also be included in the plan. Measures in this plan shall include, but are not limited to, the following: • A description of the species habitat requirements and movement patterns applicable to the project area. • A procedure for conducting preconstruction surveys and/or trapping surveys before the onset of initial ground-disturbing activities in areas with high quality habitat, as well as monitoring to be conducted before construction and/or restoration begin each day that these activities shall occur. • Direct monitoring by a qualified biologist of the clearing of occupied or potentially occupied coastal scrub in the project area that would be directly affected by project construction (not by inundation). Construction shall not proceed until areas have been surveyed to capture and relocate as many Alameda whipsnakes as reasonably possible to minimize take. However, some individuals may be undetected or move in following surveys and would be subject to take. • A protocol for the selection of USFWS-approved biological monitors who have experience with Alameda whipsnakes to monitor construction activities (such as initial clearing and grading, excavation, and the installation of silt fencing) within and next to Alameda whipsnake habitat. • Worker education materials and procedures for informing construction crews about the potential presence of Alameda whipsnakes, equipment operation procedures to minimize impacts to whipsnakes, responsibilities of project personnel (such as reporting observations of Alameda whipsnakes within or next to the construction area to the biological monitor), observing speed limits, avoiding use of the haul	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.10 continued)			road until cleared by the biological monitor, and other measures to avoid mortality of whipsnakes during construction; and the role of the monitoring staff in advising construction crews of compliance with take-avoidance measures for Alameda whipsnakes, documenting compliance in monitoring reports, and notifying USFWS within 24 hours of observation of whipsnakes within or next to a construction area. • Limit stockpiling and staging activities and vehicle and equipment refueling and maintenance to occur in nonsensitive areas. • CCWD shall prepare and implement a revegetation plan that describes pre-project conditions and available habitats for Alameda whipsnakes, invasive species control measures, and restoration and monitoring success criteria for undeveloped areas disturbed during project construction. The plan will provide the basis for the reestablishment of scrub habitat in disturbed areas and mitigation sites, and will include at a minimum an identification of mitigation areas, site preparation requirements, specifications for planting and/or seeding (e.g., what species and how many plantings), seasonal considerations for planting and site maintenance, the proposed irrigation strategy, performance criteria (e.g., 70 percent survival of plantings 5 years following installation, and 70 percent of plants exhibiting fair or better condition), any contingency measures that may be anticipated, and a provision for semi-annual monitoring and reporting. **Measure 4.6.10b:** Consistent with MSCS guidelines, CCWD shall provide compensation for permanent and temporary loss of upland scrub habitat that may support Alameda whipsnakes by either (1) compensating for permanent habitat losses by acquiring, protecting, and managing 2 to 5 acres of existing occupied habitat for every acre within the same area of occupied habitat that would be affected, and/or (2) enhancing or restoring 2 to 5 acres of suitable habitat near the affected areas for every acre of occupied habitat affected (CALFED, 2000).	
4.6.11: Project construction activities could result in direct and indirect impacts on the valley elderberry longhorn beetle and its habitat.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	The following measure is based on the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS, 1999c). **Measure 4.6.11:** CCWD shall implement USFWS guidelines (1999 or more current) for avoiding, minimizing, and mitigating project impacts on valley elderberry longhorn beetles. If avoidance is not feasible, USFWS general compensation guidelines call for replacement of elderberry plants in designated mitigation areas at a ratio from 2:1 to 5:1 for each stem greater	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.11 continued)			than 1 inch in diameter. Note that replacement ratios are by stem and not by elderberry shrub. Replacement stock shall be obtained from local sources. Plants are generally replaced at a 2:1 ratio for stems greater than 1 inch in diameter at ground level with no adult emergence holes, 3:1 for stems where emergence holes are evident in less than 50 percent of the shrubs, and 5:1 for stems greater than 1 inch in diameter with emergence holes.	
4.6.12: Project construction activities could affect active breeding bird nest sites and new powerlines could affect migratory birds.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.6.12a:** CCWD shall ensure that active nests of raptors and other special-status nesting birds are not disturbed during construction. If active construction work (i.e., ground clearing and grading, including removal of trees or shrubs) is scheduled to take place during the nonbreeding season (September 1 through January 31), no mitigation is required. If such construction activities are scheduled during the breeding season (February 1 through August 31), the following measures shall be implemented to avoid impacts on nesting raptors and other protected birds: • Within 30 days of construction, a qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction sites where access is available. • If active nests are found during preconstruction surveys, a no-disturbance buffer (acceptable in size to CDFG) shall be created around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 250 feet for other nesting birds (e.g., shorebirds, waterfowl, and passerine birds). The size of these buffer zones and types of construction activities restricted in these areas could be further modified during construction in coordination with CDFG and shall be based on existing noise and human disturbance levels in the project area. • If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation shall be required. Trees and shrubs within the construction footprint determined to be unoccupied by special-status birds, or that are outside the no-disturbance buffer for active nests, could be removed. • If construction commences during the nonbreeding season and continues into the breeding season, most songbirds that choose to nest next to active construction sites are generally considered to acclimate to	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.12 continued)			construction activities, though nest abandonment may occur in some instances. However, nesting site monitoring shall be conducted by CCWD and no-disturbance buffer zones established in coordination with CDFG around active nests to prevent impacts on nesting birds and their young. **Measure 4.6.12b:** CCWD shall follow Avian Protection Plan guidelines for powerlines. CCWD shall use state-of-the-art guidelines to reduce raptor mortality from interactions with powerlines. The Avian Power Line Interaction Committee (1994) and USFWS recommend the following: • Provide 60-inch minimum horizontal separation between energized conductors or energized conductors and grounded hardware, • Insulate hardware or conductors against simultaneous contact if adequate spacing is not possible, • Use Western-approved poles that minimize impacts to birds, and, • Increase the visibility of conductors or shield wires to prevent and minimize bird collisions. **Measure 4.6.12c:** Measures to reduce noise and vibration impact on nesting raptors near the dam and 275-TAF borrow area. As identified in Measure 4.6.12a, a qualified biologist will conduct preconstruction surveys and establish suitable avoidance buffers around active bird nests. Construction at the 275-TAF borrow area will begin either outside the active nesting season or after verification that breeding birds are absent within 500 feet of work areas. If it appears that noise or vibration from ongoing blasting or jack-hammering at the dam or 275-TAF borrow area could affect nesting raptors that arrive after the start of construction, specific measures shall be implemented to reduce noise levels. During blasting or jack-hammering, a noise level of no greater than 85 decibels (measured at the nest) will be used as general guidance for raptor nests that are established after construction. This parameter may be met through a variety of standard noise-reducing procedures for construction equipment, including the use of noise dissipaters and blasting mats. Contract specifications will include requirements for the use of blasting methods, including qualifications for the blasting contractor, the use of noise control methods and threshold noise levels, and other limitations. The	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.12 continued)			specifications will also require the submittal of a blasting plan by the contractor that will cover the proposed noise control techniques, blasting charge size and limits, and hours of blasting.	
4.6.13: Project construction activities under Alternatives 1 and 2 could affect designated critical habitat for listed species (vernal pool fairy shrimp and Contra Costa goldfields).	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM NI NI	See Measures 4.6.2a, 4.6.2b, 4.6.6a and 4.6.6b.	No Impact Less Than Significant
4.6.14: Project construction activities could affect nonlisted special-status reptile species (San Joaquin coachwhip and coast horned lizard).	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.6.14:** CCWD shall ensure that habitat disturbances are minimized in areas that are known or suspected to support San Joaquin coachwhip and coast horned lizard. Within 30 days before surface-disturbing activities, concurrent with other preconstruction wildlife surveys, a qualified biologist shall survey for special-status reptile populations. If individuals of these species are found in the project area, they shall be relocated to suitable habitat 0.5 mile or farther from the project area. Some individuals may be undetected or enter sites after surveys and would be subject to harm.	No Impact Less Than Significant
4.6.15: Project construction activities could affect nonlisted special-status mammal species (American badger, special-status bats, and San Joaquin pocket mouse).	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.6.15a:** CCWD shall minimize impacts on badgers through a combination of worker training, preconstruction surveys, and passively or actively relocating animals. Impacts on the San Joaquin pocket mouse and American badger would be reduced by limiting the footprint of direct project effects within the Western alignment. • A qualified biologist shall conduct a training session for all construction personnel focused on the protection and conservation of protected, nonlisted special-status wildlife species, including American badgers. At a minimum, the training shall include a species and habitat description for the American badger (in addition to other nonlisted special-status species). The training session shall identify the general measures that are being implemented to minimize impacts on these species as they relate to the project, and the boundaries within which the project could be accomplished. • Concurrent with other required surveys (e.g., as required for Mitigation Measure 4.7), during winter/spring months before new project activities, and concurrent with other preconstruction surveys (e.g., kit fox and burrowing owl), a qualified biologist shall perform a pre-activity survey to identify the presence of American badgers. If this species is not found, no further mitigation shall be required. If badgers are identified, they shall	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.15 continued)			be passively relocated using burrow exclusion (e.g., installing one-way doors on burrows) or similar CDFG-approved exclusion methods. In unique situations it might be necessary to actively relocate badgers (e.g., using live traps) to protect individuals from potentially harmful situations. Such relocation could be performed with advance CDFG coordination and concurrence. When unoccupied dens are encountered outside of work areas but within 100 feet of proposed activities, vacated dens shall be inspected to ensure they are empty and temporarily covered using plywood sheets or similar materials. • If badger occupancy is determined at a given site within the work area, the construction manager should be informed that work should be halted. Depending on the den type, reasonable and prudent measures to avoid harming badgers will be implemented and may include seasonal limitations on project construction near the site (i.e., restricting the construction period to avoid spring-summer pupping season), and/or establishing a construction exclusion zone around the identified site, or resurveying the den a week later to determine species presence or absence. • To minimize the possibility of inadvertent badger mortality, project-related vehicles shall observe a maximum 20 miles per hour speed limit on private roads. • To prevent accidental entrapment of badgers or other animals during construction, all excavated holes or trenches greater than 2 feet deep shall be covered at the end of each work day by suitable materials, or escape routes constructed of earthen materials or wooden planks shall be provided. Before filling, such holes shall be thoroughly inspected for trapped animals. • All food-related trash items (such as wrappers, cans, bottles, and food scraps) shall be disposed of in closed containers and removed daily from the project area. • To prevent harassment and mortality of badgers or destruction of their dens, no pets shall be allowed in the project area. Direct impacts to San Joaquin pocket mice would be minimized in the Western powerline alignment under Power Option 2 by limiting project activities within iodine bush scrub and short grasslands habitat to the smallest possible extent. The implementation of Measure 4.6.7b, which provides habitat compensation for temporary and permanent impacts to annual	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
(4.6.15 continued)			grasslands that are potentially occupied by San Joaquin kit fox, would additionally benefit American badgers and San Joaquin pocket mice. **Measure 4.6.15b:** CCWD shall minimize impacts on special-status bats by performing preconstruction surveys and creating no-disturbance buffers around active bat roosting sites. Before construction activities (i.e., ground clearing and grading, including trees or shrub removal) within 200 feet of trees that could support special-status bats, a qualified bat biologist shall survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, or strong odors) is observed, no further mitigation shall be required. If evidence of bats is observed, CCWD and its contractors shall implement the following measures to avoid potential impacts on breeding populations: • A no-disturbance buffer of 250-feet shall be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected by the indirect effects of noise and construction disturbances. However, the direct take of individuals will be prohibited. • Removal of trees showing evidence of active bat activity shall occur during the period least likely to affect bats, as determined by a qualified bat biologist (generally between February 15 and October 15 for winter hibernacula, and between August 15 and April 15 for maternity roosts). If the exclusion of bats from potential roost sites is necessary to prevent indirect impacts due to construction noise and human activity adjacent, bat exclusion activities (e.g., installation of netting to block roost entrances) shall also be conducted during these periods. If special status bats are identified in the dam or special allowances must be made to relocate bats, CCWD will coordinate the effort in advance with CDFG.	
4.6.16: Draining the reservoir during project construction under Alternatives 1, 2, and 3 could affect Pacific Flyway species, including waterfowl and shorebirds.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS NI	None Required	No Impact Less Than Significant
4.6.17: The project would not result in conflicts with local and regional conservation plans, or local plans or ordinances protecting biological resources.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.6: Biological Resources (continued)				
4.6.18: Project construction would not make a cumulatively considerable contribution to cumulative effects on special-status species and habitats.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	Implementation of measures identified throughout this section to address project effects on terrestrial biological resources would also reduce the project's contribution to cumulative effects to a less-than significant level (4.6.1a, 4.6.1b, 4.6.2a, 4.6.2b, 4.6.3a, 4.6.3b, 4.6.4a, 4.6.4b, 4.6.5, 4.6.6a, 4.6.6b, 4.6.7a, 4.6.7b, 4.6.7c, 4.6.8a, 4.6.8b, 4.6.9a, 4.6.9b, 4.6.10a, 4.6.10b, 4.6.11, 4.6.12a, 4.6.12b, 4.6.14, 4.6.15a, and 4.6.15b). These measures would mitigate both direct and indirect impacts of the project alternatives.	No Impact Less Than Significant
Section 4.7: Land Use				
4.7.1: The proposed project and alternatives would not physically divide an existing community.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact
4.7.2: Facility siting and operation under the proposed project and alternatives would not conflict with any applicable land use plans.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.7.3: Construction activities within designated Airport Land Use Compatibility Zones near the Byron Airport could cause potential temporary height impacts by conflicting with FAR Part 77 surfaces during construction.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.7.3:** Pursuant to ALUCP policy 4.3.4, CCWD shall notify the FAA, as required by FAR Part 77, Subpart B, of its proposed project to determine whether the proposed construction equipment and the location of construction activities and staging areas have the potential to intrude into protected airspace associated with Byron Airport. To facilitate FAA coordination, CCWD shall consult with County Airport staff. If necessary, CCWD will ensure that appropriate notes or modifications are made on all applicable design plans and specifications to ensure that construction activities would not conflict with the airport height limitations.	No Impact Less Than Significant
4.7.4: Construction activities within the AIA for Byron Airport could cause potential temporary flight hazards through the creation of glare or distracting lights; the generation of dust or smoke, which could impair pilot visibility; or could attract an increased number of birds.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.7.4a:** During project design, CCWD shall consult with Contra Costa County Airport staff regarding the location of illuminated equipment staging, storage, and construction areas, and the need to provide a potential Notice to Airmen (NOTAM) during construction activities. CCWD shall instruct its engineer to make appropriate notations on construction drawings and specifications to indicate that illuminated work areas shall incorporate the use of downward facing lights with amber lumens to prevent confusion to pilots.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.7: Land Use (continued)				
(4.7.4 continued)			**Measure 4.7.4b:** During project design, CCWD shall instruct its engineer to prohibit the use of temporary sediment ponds that could create open water to attract potentially hazardous wildlife. To ensure that an appropriate seed mixture is used during construction, CCWD shall instruct its engineer to make appropriate notations on construction drawings and specifications to indicate that all seed mixtures used for revegetation or for sediment and erosion control purposes should not contain rice, barely, millet, rye, or other potential food sources for avian wildlife. **Implementation of Air Quality Mitigation Measure 4.10.1:** During construction, CCWD will require the construction contractor to implement the Bay Area Air Quality Management District's (BAAQMD's) basic and enhanced dust control procedures (see Section 4.10, Air Quality)	
4.7.5: The proposed project and alternatives would not contribute to cumulative land use impacts.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact
Section 4.8: Agriculture				
4.8.1: Project construction would temporarily impact the agricultural use of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.8.1:** To minimize temporary construction impacts to agricultural activities on Important Farmland, CCWD shall ensure that the following measures are incorporated into the project construction plans and specifications: • Ensure that the existing drainage systems at proposed project sites needed for farming activities function as necessary to avoid disrupting agriculture • Design dewatering operations to maximize dewatering in the immediate area of trench and to minimize drawdown area outside of trench during dewatering of construction trenches and other excavated areas; monitor soil moisture in adjacent crop fields to ensure adequate crop moisture and assist with irrigation scheduling • Locate construction access and staging areas in areas that are fallow and use existing roads to access construction areas to the extent possible • Coordinate construction scheduling as practicable to minimize disruption of agricultural operations by scheduling excavation before or after the growing season	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.8: Agriculture (continued)				
(4.8.1 continued)			• Minimize construction dust on crops by implementing Air Quality Measures 4.10.1 The above mitigation measures would reduce temporary construction impacts to less-than-significant levels.	
4.8.2: The project would permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to nonagricultural use.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI SU SU LSM LS	**Measure 4.8.2a:** To support the continued productive use of Important Farmlands in the project area, CCWD shall ensure that the following measures are taken during project construction activities in Important Farmland: • Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. The surface and subsurface soil layers will be stockpiled separately and returned to their appropriate locations in the soil profile. • Monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density so that over-compaction of the top layers of soil is avoided. • Rip the top soil layers, where necessary, to achieve the appropriate soil density. Ripping may also be used in areas, such as in construction staging locations, where vehicle and equipment traffic have compacted the top soil layers. • Minimize compaction and loss of soil structure by not working or traveling on wet soil. Before construction begins, geotechnical testing will be done to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed. • Remove all construction-related debris from the soil surface. This will prevent rock, gravel, and construction debris from interfering with agricultural activities. • Perform soil density monitoring during backfill and ripping to minimize excessive compaction and minimize effects on future agricultural land use. • Remove topsoil before excavating in fields. Return topsoil to top of fields to avoid detrimental inversion of soil profiles.	No Impact. Significant and unavoidable for Alternatives 1 and 2. These mitigation measures would reduce the impact of the proposed conversion of Farmland of Statewide Importance to nonagricultural uses, but not to a less-than-significant level. Less than Significant for Alternatives 3 and 4.

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.8: Agriculture (continued)				
(4.8.2 continued)			• Control compaction to minimize changes to lateral groundwater flow, which could affect both irrigation and internal drainage. **Measure 4.8.2b:** CCWD will provide the following mitigation for the conversion of Important Farmland: For each acre of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance that is permanently converted to nonagricultural use, 1 acre of agricultural conservation easement will be obtained. An agricultural conservation easement is a voluntary, recorded agreement between a landowner and a holder of the easement that preserves the land for agriculture. The easement places legally enforceable restrictions on the land. The exact terms of the easement are negotiated, but restricted activities will include subdivision of the property, non-farm development, and other uses that are inconsistent with agricultural production. The mitigation lands must be of equal or better quality (according to the latest available FMMP data) and have an adequate water supply. In addition, the mitigation lands must be within the same county. Information presented in Table 4.8-6 indicates that this compensatory mitigation would require acquisition of easements on about 22 acres of Farmland of Statewide Importance, preferably within Contra Costa County.	
4.8.3: The project would not conflict with zoning for agricultural use or a Williamson Act contract.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS NI	None Required	No Impact Less Than Significant
4.8.4: The project would involve changes in the environment that, due to their location or nature, could contribute to cumulative impacts from conversion of Important Farmland to nonagricultural uses.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI SU SU LSM LS	Implementation of Agricultural Resources Mitigation Measures 4.8.1 and 4.8.2 (a and b) would minimize potential impacts under Alternatives 1 and 2; however, those measures would not reduce cumulative impacts to less-than-significant levels. The level of significance after mitigation would be a significant and unavoidable cumulative impact for Alternatives 1 and 2. With Mitigation Measure 4.8.2a, Alternative 3 would not result in a cumulatively considerable contribution to a significant impact on agriculture.	No Impact Significant and Unavoidable for Alternatives 1 or 2; Less than Significant for Alternatives 3 and 4.
Section 4.9: Transportation and Circulation				
4.9.1: Project construction activities would intermittently and temporarily increase traffic congestion due to vehicle trips generated by construction workers and construction vehicles on area roadways.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.9.1a:** Schedule project generated construction truck trips on Vasco Road, Byron Highway, SR 4, and SR 4 Bypass outside the peak morning and evening commute hours such that the frequency of construction truck trips on these roads would be no greater than one every two minutes (i.e., 30 trucks per hour) during these peak commute periods.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.9: Transportation and Circulation (continued)				
(4.9.1 continued)			**Measure 4.9.1b:** Develop and implement a construction truck hauling plan that designates specific routes to be used to access the various project facilities when multiple facility sites are under construction concurrently so that project-generated construction traffic is dispersed over a number of roads in the project area.	
4.9.2: Project construction activities under Alternatives 1, 2 and 3 would intermittently and temporarily impede access to local streets or adjacent uses, including access for emergency vehicles and could substantially increase traffic hazards due to construction in or adjacent to roads or possible road wear.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.9.2a:** Maintain alternative property access or trench plates on site to restore access for emergency vehicles at all times. **Measure 4.9.2b:** Provide pre-notification to local police, fire, and emergency service providers of the timing, location, and duration of construction activities that could affect the movement of emergency vehicles on area roadways. **Measure 4.9.2c:** Install traffic control devices as specified in Caltrans' Manual of Traffic Controls for Construction and Maintenance Work Zones where needed to maintain safe driving conditions. This measure includes the use of signage to alert motorists of construction activities, potential hazards and travel detours as well as the use of flaggers when appropriate. **Measure 4.9.2d:** Prior to construction, CCWD or its contractors will survey and describe the pre-construction roadway conditions on rural roadways and residential streets (including, but not limited to, Walnut Boulevard and Camino Diablo). Within 30 days after construction is completed, CCWD will survey these same roadways and residential streets in order to identify any damage that has occurred. Roads damaged by construction will be repaired to a structural condition equal to the condition that existed prior to construction activity.	No Impact Less Than Significant
4.9.3: Traffic associated with operation of project facilities, including the expanded recreation facilities, would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.9.4: Construction of project alternatives, when combined with construction of other future projects, could contribute to construction-related short-term cumulative impacts to traffic and transportation (traffic congestion, access, and traffic safety).	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.9.4:** Prior to construction, CCWD will coordinate with the appropriate local government departments in Brentwood, Contra Costa County, Alameda County, and Caltrans, and with utility districts and agencies regarding the timing of construction projects that would occur near project sites. Specific measures to mitigate potential significant impacts will be determined as part of the interagency coordination, and could include measures such as employing flaggers during key construction periods, designating alternate haul routes, and providing more outreach and community noticing.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.10: Air Quality				
4.10.1: Construction of project alternatives could generate short-term emissions of criteria air pollutants: ROG, NOx, CO, and PM10 that could contribute to existing nonattainment conditions and further degrade air quality. However, project alternatives would not exceed federal general conformity *de minimis* standards for emissions.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.10.1:** During construction, CCWD will require the construction contractor to implement the measures that are specified under BAAQMD's basic and enhanced dust control procedures. These include: • Basic Control Measures – CCWD and its contractors will implement the following controls at all construction sites: - Water all active construction areas at least twice daily. - Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. - Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. - Sweep daily (with water sweepers) all paved access roads, parking areas, and staging area at construction sites. - Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. • Enhanced Control Measures – CCWD and its contractors will implement the following measures during project construction for project facility sites of 4 acres or greater: - Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for one month or more). - Enclose, cover, water twice daily, or apply (nontoxic) soil stabilizers to exposed stockpiles (such as dirt and sand). - Limit traffic speeds on unpaved roads to 15 miles per hour. - Install sandbags or other erosion control measures to prevent silt runoff to public roadways. - Replant vegetation in disturbed areas as quickly as possible. • CCWD and its contractors will implement the following additional control measure during reservoir expansion construction due to the large area of disturbance: - Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site onto public roads.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.10: Air Quality (continued)				
4.10.2: Operation of project alternatives would not result in emissions of criteria air pollutants at levels that would substantially contribute to a potential violation of applicable air quality standards or to nonattainment conditions.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.10.3: Construction and/or operation of project alternatives would not expose sensitive receptors to substantial pollutant concentrations.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.10.4: Operation of project alternatives would not create objectionable odors affecting a substantial number of people.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.10.5: Construction and operation of project alternatives would not result in a cumulatively considerable increase in greenhouse gas emissions.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.10.6: Construction and operation of the project alternatives could result in cumulatively considerable increases of criteria pollutant emissions.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	Implement Mitigation Measure 4.10.1.	No Impact Less Than Significant
Section 4.11: Noise				
4.11.1: Construction of facilities under the proposed project and alternatives could generate noise levels that exceed the Contra Costa County or Alameda County noise standards at nearby sensitive receptors if construction activities are carried out during noise-sensitive hours, causing sleep disturbance and/or annoyance.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.11.1a:** To avoid noise-sensitive hours of the day and night, construction will be limited to the hours between 7 a.m. to 7 p.m. Monday through Friday, and 8 a.m. to 5 p.m. on Saturday and Sunday for the following facilities, construction activities and project areas: • Alternatives 1, 2, 3, or 4: Construction of any facilities in those areas that are 3,000 feet or less from sensitive residences. At 3,000 feet, excavation activities would attenuate to 45 dBA and would be less than the quietest existing noise environment measured and depicted in Table 4.11-2 and would not be noticeable.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.11: Noise (continued)				
(4.11.1 continued)			**Measure 4.11.1b:** To further address the impact of construction for all alternatives, construction contractors will implement the following: • Signs will be posted at all construction site entrances to the property when project construction begins to inform all contractors/subcontractors, their employees, agents, material haulers, and all other persons at the applicable construction sites of the basic requirements of Mitigation Measures 4.11.1a, 4.11.1c, and 4.11.1d. • Signs will be posted at the construction sites that include permitted construction days and hours, a day and evening contact number for the job site, and a contact number in the event of problems. • An onsite complaint and enforcement manager will respond to and track complaints and questions related to noise. **Measure 4.11.1c:** To reduce noise impacts due to construction for all alternatives, construction contractors will be required to implement the following measures: • During construction, the contractor will outfit all equipment, fixed or mobile, with properly operating and maintained exhaust and intake mufflers, consistent with manufacturers' standards. • Impact tools (e.g., jackhammers, pavement breakers, and rock drills) used for construction will be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust will be used. External jackets on the tools themselves will be used where feasible. Quieter procedures, such as use of drills rather than impact tools, will be used whenever construction occurs within 3,000 feet of sensitive residences. • Stationary noise sources will be located as far from adjacent sensitive receptors as possible. **Measure 4.11.1d:** For all alternatives, no amplified sources (e.g., stereo "boom boxes") will be used in the vicinity of residences during project construction. **Measure 4.11.1e:** To further reduce less than significant pile driving noise impacts at the Delta Pump Station facilities under all alternatives, CCWD shall require construction contractors to implement "quiet" pile-driving technology (such as sonic or vibratory pile-driver use; pre-drilling of piles; jetted pile-driving) where feasible, with consideration of geotechnical and structural requirements and conditions.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.11: Noise (continued)				
4.11.2: Operation of the project and alternatives would generate traffic, stationary source, and area source noise similar to existing noise associated with operation of Los Vaqueros Reservoir system and would not exceed County noise requirements.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.11.3: Project construction would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.11.4: The proposed project or alternatives would not make a cumulatively considerable contribution to noise levels during either construction or operation.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.12: Utilities and Public Service Systems				
4.12.1: Construction or operation of project alternatives could temporarily disrupt utilities and public service systems such that a public health hazard could be created or an extended service disruption could result.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Implementation of Transportation and Circulation Mitigation Measure 4.9.2:** This mitigation involves requirements to reduce the potential for impeding emergency access. **Implementation of Hazards Materials and Public Safety Mitigation Measure 4.13.3:** This mitigation involves required activities to reduce the potential risk of wildfires. **Measure 4.12.1a:** Prior to construction of the project facilities and once pipeline alignments have been finalized, a detailed survey identifying utilities along the proposed alignments will be conducted. The survey results and the following measures will be incorporated into final design plans and specifications to avoid or minimize potential conflicts with utilities: a. Utility excavation and encroachment permits will be acquired from the appropriate agencies, including the Public Works Departments of Contra Costa and Alameda Counties. CCWD will incorporate permit conditions in contract specifications that are designed to ensure no disruptions in service occur during construction. Contractors will be required to comply with permit conditions contained in contract specifications.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.12: Utilities and Public Service Systems (continued)				
(4.12.1 continued)			b. CCWD shall ensure that Underground Service Alert is notified at least 14 days prior to initiation of construction activities of the underground portions of each transmission lines and utility structures. Underground Service Alert verifies the location of all existing underground utilities and alerts the other utilities to mark their facilities in the area of anticipated construction activities. c. A detailed engineering and construction plan will be prepared as part of the design plans and specifications. This plan will include procedures for the excavation, support, and fill of areas around utility cables and pipes to ensure that utility cables are not damaged. All affected utility service providers will be notified of the construction plans and schedule, and arrangements will be made with these entities regarding the protection, relocation, or temporary disconnection of services. d. In shared utility easement areas where a project pipeline might parallel wastewater mains, the engineering and construction plans will include trench-wall support measures to guard against potential trench wall failure and the resulting loss of structural support for the wastewater main. e. The California Department of Health Services standards will be observed; these standards require: (1) a 10-foot horizontal separation between parallel sewer and water mains (gravity or force mains); (2) a 1-foot vertical separation between perpendicular water and sewer line crossings; and (3) encasing sewer mains in protective sleeves where a new water line crosses under or over an existing wastewater main. If the separation requirements cannot be maintained, a variance will be obtained from the Department of Health Services through the provision of sewer encasement or other means the department deems suitable. f. Final construction plans and specifications will be coordinated with affected utilities including PG&E, Western, and the California Department of Health Services Sanitary Engineering Branch. g. Emergency response plans and protocols, as required under construction permit conditions, shall be incorporated into project construction specifications. **Measure 4.12.1b:** CCWD shall phase construction to minimize the potential for water supply emergencies and complete formal arrangements with EBMUD for water supply backup prior to draining the Los Vaqueros Reservoir and initiating project construction.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.12: Utilities and Public Service Systems (continued)				
4.12.2: Project alternatives would not require or result in construction of new or expanded utility infrastructure or public service facilities that would result in substantial adverse physical impacts.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.12.3: Construction of the project alternatives could increase solid waste generation such that the capacity of local landfills would be exceeded or the project would not comply with state regulations related to solid waste.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.12.3:** CCWD will incorporate into the contract plans and specifications the requirement that the contractor implement solid waste reduction and debris recovery practices as developed by CCWD. The solid waste reduction / debris recovery specifications will include the following items. a. describe the planned management methods for all types of construction and demolition debris (e.g., reuse, recycling, or disposal), and indicate the types of debris expected to be generated by the project (e.g., wood, drywall, concrete, cardboard, and metal) b. name all service providers and/or facilities to be used for debris management (or indicate that the debris, such as dirt, will be reused onsite) c. demonstrate that at least 50 percent (by weight) of jobsite debris is diverted from disposal in a landfill by providing receipts and/or gate-tags from all facilities and service providers used to recycle, reuse, or dispose of jobsite debris. Project waste generation would be avoided or minimized in a number of ways, which would be outlined in the project's solid waste reduction / debris recovery plan, and incorporated into project plans and specifications for implementation by contractors selected to complete project construction. To reduce solid waste generation, a series of practices would be developed, as follows: *Re-use of excavation backfill*. Fill materials excavated during project grading and drilling would be reused as fill materials during project construction, while soils excavated during pipeline construction would be used to backfill trenches after pipeline installation; *Recycling of materials*. Some construction materials, including some wood scraps, metals, and packaging materials could be recycled for later resale e.g. – wood scraps sold as landscape mulch. *Re-Use of excess fill*. Clean fill could be accepted for use at other construction sites, or stored at existing sand and gravel facilities until (re)used as clean fill.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.12: Utilities and Public Service Systems (continued)				
(4.12.3 continued)			*Roadway sub-base or surface material*. Larger waste rock from excavation of tunnels would be placed along project access roads as a roadway sub-base or surface. *Divert waste to non-landfill locations*. Additional amounts of the larger waste rock could be disposed of at a 22-acre area near the terminus of Byron Hot Springs Road.	
4.12.4: Construction of the project alternatives could make a cumulatively considerable contribution to cumulative effects on public services and utilities, or local landfill capacity.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	Implementation of Mitigation Measures 4.12-1 and 4.12-3, including implementation of a solid waste reduction / debris recovery plan as required under AB 939, will reduce potential cumulative impacts to less-than-significant levels.	No Impact Less Than Significant
Section 4.13: Hazardous Materials / Public Health				
4.13.1: Construction of the project and alternative components would disturb subsurface soils and groundwater; if hazardous substances are present in the disturbed areas, construction workers and the public could be exposed to these substances.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.13.2: Project construction and operation could, through routine transport, use or disposal, accidentally release hazardous materials, thereby exposing construction workers, project personnel, and the public to hazardous materials, or accidentally releasing hazardous materials into the soil, groundwater, and/or a nearby surface water body.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Implementation of Hydrology Mitigation Measures 4.5.1a and 4.5.1b:** These measures involve protection of water quality. **Measure 4.13.2:** CCWD will incorporate into the contract specifications that require the contractor to enforce strict onsite best management practices (BMPs) to keep hazardous materials from accidental release. These practices will include, without limitation, designating a central storage area to keep hazardous materials away from any waterways and storm drain inlets; refueling equipment in designated areas; containing contaminants away from any waterways or storm drain inlets; preparing a spill prevention, control, and countermeasure plan; and regularly inspecting construction vehicles for leaks.	No Impact Less Than Significant
4.13.3: Improper handling or use of flammable or combustible materials such as internal combustion equipment could result in wildland fires, exposing people or structures to a significant risk of loss, injury, or death.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.13.3:** CCWD will incorporate into contract specifications the requirement that the contractor enforce strict onsite BMPs to reduce the potential for accidental fires. 1) All equipment used during construction must have an approved spark arrestor.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.13: Hazardous Materials / Public Health (continued)				
(4.13.3 continued)			2) The contractor/staff responsible for construction will submit a Fire Safety Plan for review by the Contra Costa County Fire Prevention Bureau. This plan will include precautions to carry out during high-fire danger, a list of fire-suppression equipment and tools to have on hand, a description of available communications, specifications for the supply of water to have on hand, and descriptions of other actions that will reduce the risk of ignition and facilitate immediate control of an incipient fire. 3) Ensuring easily accessible fire-suppression equipment is available at all work locations.	
4.13.4: Construction and operation of project power supply facilities would not locate electrical transmission facilities within 150 feet of a school.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact
4.13.5: The project alternatives would not contribute to cumulative impacts associated with release of hazardous materials or other hazards.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.14: Visual/Aesthetic Resources				
4.14.1: The project alternatives would not have a substantial, demonstrable negative aesthetic effect on a scenic vista or from a county-designated scenic highway or route.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.14.2: The project alternatives would not substantially degrade the existing visual character or quality of the site and its surroundings, except Alternative 4 due to the borrow area in Kellogg Valley.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LSM	**Measure 4.14.2a:** CCWD shall develop and implement a site restoration plan specifically for the 160 TAF borrow area that shall provide for finished topography that, while not restored to prior condition, shall blend in with the surrounding landscape, minimizing the visual contrast. The plan shall include a revegetation plan that includes a native seed mix typical of the surrounding area. While these site restoration steps are similar to those that will be required at all project sites, this specific project area requires its own restoration plan because of the extent of ground disturbance that will occur here.	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.14: Visual/Aesthetic Resources (continued)				
4.14.3: The project alternatives would not create a new source of substantial light but Alternatives 1, 2, and 3 could create a new source of substantial glare that could adversely affect views in the area.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LS	**Measure 4.14.3:** Non-specular conductors shall be installed to reduce the potential glare effects and the level of visual contrast between the transmission line and its landscape setting.	No Impact Less Than Significant
4.14.4: The project alternatives would not make a cumulatively considerable contribution to adverse effects on visual/aesthetic resources in the project area or broader region.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.15: Recreation				
4.15.1: Construction of the project alternatives would result in a short-term reduction of recreational opportunities in the project area due to construction activities outside the watershed and closure of the watershed to the public during the construction period, but would enhance recreational opportunities in the long-term.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.15.1a:** Before any recreational facilities are closed in the watershed, CCWD shall prepare and implement a public outreach program and promote the program via the web, billing inserts, and other methods to inform current and potential recreational users of the temporary closure of the Los Vaqueros Reservoir day-use facilities and inform customers of other recreational opportunities in the area. **Measure 4.15.1b:** If EBRPD's proposed Delta Trail Extension is developed and open to the public before or during construction of the new Delta Intake and Pump Station, CCWD shall provide EBRPD with an anticipated closure schedule; prepare and implement a public outreach program and promote the program via the web, billing inserts, and other methods to inform current and potential recreational trail users of the temporary closure of the Delta Trail Extension and inform customers of other recreational trail opportunities in the area; and place signage to the north and south of the new Delta Intake and Pump Station site along the trail to inform recreational users of the trail closure, alternative trail options, and anticipated timing for the reopening.	No Impact Less Than Significant
4.15.2: The project alternatives would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.15.3: No other reasonably foreseeable future projects would also reduce recreational opportunities in the project area, similar to those opportunities affected by the project alternatives, or increase the use of existing	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.15: Recreation (continued)				
(4.15.3 continued) neighborhood and regional parks or other recreational facilities; therefore, there does not appear to be the potential for the project alternatives to contribute to a cumulative effect on recreation facilities, opportunities or experience.				
Section 4.16: Cultural and Paleontological Resources				
4.16.1: Construction and management of project components would cause a substantial adverse change in the significance of a historical and/or unique archaeological resource as defined in Section 15064.5 or historic property or historic district, as defined in Section 106 of the NHPA (36 CFR 800), or in a previously undiscovered cultural resource.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	Under both federal and state law, the first mitigation measure to be considered for a significant impact to a cultural resource is relocation of project elements so that the impact is avoided. For all project alternatives, some project elements could not be relocated to avoid impacts on cultural resources. **Measure 4.16.1a: *Los Vaqueros Reservoir Expansion; Dam Modification; and Other Sites Where Cultural Resources Can Be Avoided***. The preferred mitigation measure under CEQA is site avoidance. If feasible, avoid impacts to known cultural resources through project design modification. Using GIS mapping techniques, overlay project design plans on boundary maps of known cultural resources and redesign project components to avoid significant cultural resources by ensuring they fall into areas designated as open space or otherwise undeveloped areas. This is the least costly mitigation measure and is favored by archaeologists, local historical societies, and Native American groups. **Measure 4.16.1b: *Los Vaqueros Reservoir Expansion; Dam Modification; and Other Sites Where Cultural Resources Cannot Be Avoided***. If feasible, protect cultural resources in place. If resources cannot be protected in place, implement data recovery consistent with 14 CCR § 15126.4(b)(3)(c) and with the guidelines set forth in the Secretary of Interior's standards and guidelines (Standards I through IV). CCR § 15126.4(b)(3)(c) states that a data recovery plan shall be prepared and adopted prior to any excavation being undertaken. Because the historical significance of most archaeological sites lies in their potential to contribute to scientific research, the data recovery plan shall make provision for adequately recovering the scientifically consequential data from and about the historical resource. Similarly geared toward scientific inquiry, the Secretary of Interior's standards include following an explicit statement of objectives and employing methods that respond to needs identified in the planning process; using	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.16: Cultural and Paleontological Resources (continued)				
(4.16.1 continued)			methods and techniques of archaeological documentation (data recovery) selected to obtain the information required by the statement of objectives; assessing the results of the archaeological documentation against the statement of objectives and integrating them into the planning process; and reporting and making public the results of the archaeological documentation. To this end, data recovery findings shall be documented in a data recovery report, which shall follow guidelines set forth by SHPO for such reports. **Measure 4.16.1c: *Los Vaqueros Reservoir Expansion; Dam Modification; Marina Access Road; Inlet/Outlet Pipelines; Western Hiking Trail/Access Road; Delta-Transfer Pipeline; Transfer-LV Pipeline; and Transfer-Bethany Pipeline.*** Prior to ground disturbing activities, conduct subsurface investigations (i.e., archeological testing) for undiscovered cultural resources in the portions of the APEs for the project elements that are identified as having moderate to high potential for undiscovered subsurface cultural resources. Conduct data recovery as described in Mitigation Measure 4.16.1b. **Measure 4.16.1d: *All project elements near known cultural resources or in areas with high potential for undiscovered cultural resources.*** During construction, restrict ground-disturbing activities to the minimum area feasible and fence off known cultural resources and high-potential areas that are outside but near the construction area. To prevent construction-related adverse impacts on historic properties within the APE, CCWD shall instruct its contractors to place fencing or other barriers around sites that could be affected. CCWD shall prepare and implement a cultural resource construction monitoring plan to ensure that monitoring and/or physical barriers adequately protect sites from incidental construction activities. For example, the petroglyph boulder (CA-CCO-597) that is within the APE for the Transfer-Bethany Pipeline shall be fenced during construction, thereby creating a 20-foot-wide buffer to ensure that heavy equipment traffic and staging- and storage-related activities do not cause inadvertent damage to the property. **Measure 4.16.1e: *All project elements.*** All construction personnel who work on the project shall undergo a training session to inform them of the presence and nature of cultural resources and human remains within the project area; of the laws protecting these resources and associated penalties; and of the procedures to follow if they discover cultural resources during project-related work. **Measure 4.16.1f: *All project elements.*** If previously undiscovered cultural resources (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, structure/building remains, etc.) are discovered during ground-	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.16: Cultural and Paleontological Resources (continued)				
(4.16.1 continued)			disturbing activities, CCWD shall authorize the construction contractor to stop work in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find according to NRHP and CEQA (including CRHR) criteria, and, if necessary, develop appropriate treatment measures in consultation with CCWD. Potential treatment measures for significant and potentially significant resources may include, but would not be limited to, no action (i.e., resources determined not to be significant), avoidance of the resource through changes in construction methods or project design, and implementation of a program of testing and data recovery, in accordance with PRC § 21083.2. Implementation of this mitigation measure would ensure proper identification and treatment of any significant cultural resources uncovered as a result of project-related ground disturbance and would reduce the potential impact resulting from inadvertent damage or destruction of unknown cultural resources during construction to a less-than-significant level. **Measure 4.16.1g:** Impacts on some sites from increased access and vandalism can be minimized by updating the existing Cultural Resources Management Plan. The plan was developed for the original Los Vaqueros Project and it should be updated for the proposed project. To ensure the long-term protection of these sites, the existing plan provides guidelines to prevent impacts on historic properties, such as restrictions for use in areas of sensitivity, and a long-term monitoring program to ensure that cultural resources are protected in the future. The plan states that should vandalism be detected during the long-term monitoring program, a plan should be in place to organize the documentation and investigation of the endangered resource. Such an HPTP would entail elements including complete photographic and mapping documentation of the resource, as well as a phased archaeological testing and data recovery program. Such an HPTP shall be developed for each historic property that is determined to be visible from trails, exposure due to erosion, and vulnerable to vandalism for the proposed project. **Measure 4.16.1h:** Results from the recordation, testing, and data recovery of the prehistoric and historic-era resources within the District shall be synthesized into a comprehensive scholarly study of the prehistory and history of the District. Particular attention shall be paid to the change in use through time of the lower elevations of the watershed and resources therein within the context of the greater watershed. Additionally, the same information shall be synthesized into a document for public education that can be easily accessed and understood by members of the public including children of grade-school age.	

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.16: Cultural and Paleontological Resources (continued)				
4.16.2: Ground-disturbing activities could encounter and destroy paleontological resources in certain geologic formations underlying the project area.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.16.2a:** A trained paleontologist shall monitor the earth disturbing activities in areas of high and very high sensitivity. If a paleontological resource is encountered during excavation monitoring, the onsite monitor shall halt or divert excavations within 50 feet of the find until the discovery is examined by the monitor in accordance with Society of Vertebrate Paleontology standards. If the resource is determined not to be significant, construction shall resume. If the resource is determined to be significant, construction shall remain halted and the paleontologist shall prepare and implement a salvage plan in accordance with Society of Vertebrate Paleontology standards to recover, remove and/or mold exposed paleontological resources and conduct sampling where necessary to recover microfossil remains (Society of Vertebrate Paleontology, 1995). The paleontologist shall notify CCWD and Reclamation if the find is determined to be significant. **Measure 4.16.2b:** Prior to the start of construction on project elements that would require earth disturbing activities in areas of low or moderate paleontological sensitivities, construction personnel involved with earth-moving activities shall be trained regarding the appearance of fossils and proper notification procedures. This worker training shall be prepared and presented by a qualified paleontologist. If workers discover paleontological resources during ground-disturbing activities, work shall stop within 50 feet of the find until a qualified paleontologist can assess the significance of the find and determine the appropriate next steps, depending on the significance of the find as described in Measure 4.16.2a.	No Impact Less Than Significant
4.16.3: Construction and management of project components could disturb human remains, including those interred outside of formal cemeteries.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	**Measure 4.16.3: *Stop Potentially Damaging Work if Human Remains Are Uncovered During Construction, as a Result of Erosion, or of Vandalism, Assess the Significance of the Find, and Pursue Appropriate Management.*** California law recognizes the need to protect interred human remains, particularly Native American burials and associated items of patrimony, from vandalism and inadvertent destruction. The procedures for the treatment of discovered human remains are contained in California Health and Safety Code §7050.5 and §7052 and California PRC §5097. In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, including construction, erosion, or vandalism, all such activities within a 100-foot radius of the find shall be halted immediately and CCWD's designated representative shall be notified. CCWD shall immediately notify the county coroner and a qualified professional archaeologist. The coroner is required	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.16: Cultural and Paleontological Resources (continued)				
(4.16.3. continued)			to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If death appears to have resulted from homicide, suicide, poisoning, accident, violence, or certain contagious diseases and hazards, the coroner is required to investigate as specified in Government Code Section 27491. If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). CCWD's responsibilities for acting upon notification of a discovery of Native American human remains are identified in detail in the California PRC Section 5097.98. CCWD or its appointed representative and the professional archaeologist shall contact the Most Likely Descendent (MLD), as determined by the NAHC, regarding the remains. The MLD, in cooperation with the property owner and the lead agencies, shall determine the ultimate disposition of the remains in accord with the provisions of Section 5097.98. If NAHC cannot identify any MLDs, if the MLD fails to make a recommendation, or CCWD disagrees with the MLDs recommendation and mediation fails to resolve the issue, then CCWD must reinter the human remains with appropriate dignity on a part of the property not subject to further subsurface disturbance, as is specified in Section 5097.98(b) and 14 Cal. Code Regs § 1064.5(e)(2).	
4.16.4: Construction and management of project components would contribute to adverse cumulative impacts to cultural and/or paleontological resources.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LSM LSM LSM LSM	Measures 4.16.2a and 4.16.2b, as previously stated.	No Impact Less Than Significant
Section 4.17: Socioeconomic Effects				
4.17.1: Project construction could temporarily generate new income and local employment that could benefit Contra Costa County's economy.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI B B B B	None Required	No Impact Beneficial
4.17.2: Loss of agricultural land use associated with project construction and development could affect Contra Costa County and Alameda County's economy.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.17: Socioeconomic Effects (continued)				
4.17.3: Short-term loss of recreation income associated with project construction could affect Contra Costa County's economy.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.17.4 Construction of the project alternatives, when combined with construction of other future projects, could have a potentially beneficial effect on income and local employment.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI B B B B	None Required	No Impact Beneficial
4.17.5: Construction of the project alternatives, when combined with construction of other future projects, could have a potential cumulative effect on Contra Costa County's economy as a result of temporary loss of agricultural land uses.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI SU SU LS LS	**Implementation of Agricultural Resources Mitigation Measures 4.8.1 and 4.8.2 (a and b):** This would minimize potential impacts under Alternatives 1 and 2; however, those measures would not reduce cumulative impacts to less than significant levels. The level of significance after mitigation would be a significant and avoidable cumulative impact.	No Impact Significant and Unavoidable for Alternatives 1 or 2; Less than Significant for Alternatives 3 and 4.
4.17.6 Construction of the project alternatives, when combined with construction of other future projects, could have a potential cumulative effect on Contra Costa County's economy as a result of temporary recreational impacts.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
Section 4.18: Environmental Justice				
4.18.1: Construction and operation of the project alternatives would result in air quality, noise, and/or other environmental impacts related to traffic and other construction activities that would not disproportionately affect nearby minority and/or low-income communities.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.18.2: Construction and operation of the project alternatives would not disproportionately affect local employment opportunities for minority and/or low-income communities in the vicinity of the project.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact

TABLE ES-7 (Continued)
CEQA ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental Impact	Impact to Alternative		Mitigation Measure	Significance After Mitigation
Section 4.18: Environmental Justice (continued)				
4.18.3: Construction and operation of the project alternatives when combined with construction of other past, present, and probable future projects, would result in air quality, noise, and/or other environmental impacts related to traffic and other construction activities that would not disproportionately affect nearby minority and/or low-income communities.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI LS LS LS LS	None Required	No Impact Less Than Significant
4.18.4: Construction and operation of the project, when combined with construction of other past, present, and probable future projects, would not disproportionately affect local employment opportunities for minority and/or low-income communities in the vicinity of the project.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact
Section 4.19: Indian Trust Assets				
4.19.1: The project would not affect Indian Trust Assets.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact
Section 4.20: Growth-Inducing Effects				
4.20.1: Construction and operation of the proposed project would not result in direct or indirect growth-inducing effects.	No Action: Alternative 1: Alternative 2: Alternative 3: Alternative 4:	NI NI NI NI NI	None Required	No Impact

CHAPTER 1
Purpose, Need and Objectives for the Los Vaqueros Reservoir Expansion Project

1.1 Introduction

The San Francisco Bay/Sacramento–San Joaquin Delta estuary is the largest estuary on the West Coast and provides essential habitat for a diverse array of fish and wildlife. It is also the critical hub in the conveyance of drinking water supplies to more than two-thirds of the California population and irrigation supplies to 7 million acres of agricultural lands.

In response to worsening ecological conditions and increasing risk to water supplies, the Governor of California assembled a Blue Ribbon Task Force to develop "a durable vision for sustainable management of the Delta" with the goal of "…managing the Delta over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well-being of the people of the state." The Task Force issued its Delta Vision report in December 2007, followed by the Delta Vision Strategic Plan in October 2008, both emphasizing the need to manage the Delta to two co-equal goals - restoring the Delta ecosystem and creating a more reliable water supply for California (Delta Vision Blue Ribbon Task Force, 2007 and 2008). This state-initiated planning process, known as Delta Vision, builds and expands upon the work of the CALFED Bay-Delta Program (CALFED).

CALFED, a consortium of state and federal agencies with resource management and regulatory responsibilities in the Bay-Delta estuary, was formed in the mid-1990s to develop "a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system" (CALFED, 2000). The CALFED planning phase culminated with publication of the Final Programmatic EIS/EIR on the proposed CALFED Bay-Delta Program in July 2000 and issuance of the federal Record of Decision (ROD) in August 2000. Implementation proceeded in twelve program areas including ecosystem restoration, water supply reliability, storage, conveyance and the Environmental Water Account (EWA). Expansion of the existing Los Vaqueros Reservoir (the reservoir), owned and operated by Contra Costa Water District (CCWD), is one of five surface water storage projects identified for further investigation in the CALFED Storage Program.

The planning phase of the Los Vaqueros Reservoir Expansion Project began in January 2001, managed by CCWD and supported and funded by the U.S. Department of Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation) and the California Department of Water Resources (DWR). After preliminary planning studies demonstrated that the proposed expansion

project could result in environmental, water supply reliability and water quality benefits, voters in CCWD's service area were asked to vote on whether CCWD should consider expansion of its reservoir. The 2004 advisory ballot measure won approval of 62 percent of the voters. Since the vote, the proposed expansion project has been further developed and refined through detailed studies and extensive public outreach.

The Los Vaqueros Reservoir is an off-stream storage reservoir near the Delta. CCWD currently pumps water from the Delta into this 100-thousand-acre-foot (TAF) capacity reservoir through state-of-the-art, positive barrier fish screens. Having this storage capacity allows CCWD to improve the water quality delivered to its customers and to adjust the timing of its Delta water diversions throughout the year to accommodate the life cycles of Delta aquatic species, thus reducing species impact and providing a net benefit to the Delta environment.

Expansion of the reservoir and related facilities would provide an opportunity to expand these benefits and improve related system reliability and flexibility, furthering the goals of Delta Vision and CALFED through a cooperative effort among CCWD and project participants. Through the use of the expanded reservoir and related facilities, along with existing CCWD facilities and assets, and through coordinated operations with the State Water Project (SWP) and Central Valley Project (CVP), fishery protection and Bay Area water supply reliability can be substantially improved.

The four project alternatives evaluated here all include an enlarged Los Vaqueros Reservoir and the related facilities to operate the reservoir. Two of the alternatives include a South Bay Connection, which would be accomplished through construction of a new Delta intake and pump station and a conveyance pipeline connecting the Los Vaqueros Reservoir facilities to three Bay Area water agencies: Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7), Alameda County Water District (ACWD) and Santa Clara Valley Water District (SCVWD), all of which receive SWP water through the South Bay Aqueduct. SCVWD also receives CVP water. Depending on which, if any of the alternatives is ultimately approved, such a project could reduce impacts to Delta fisheries resulting from SWP and CVP operations, provide water to improve environmental conditions in the Delta and its associated tributary rivers and wetlands, and improve water supply reliability for Bay Area water users.

A decision to approve any of the project alternatives requires compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CCWD is the CEQA lead agency and Reclamation is the federal NEPA lead agency. State CEQA Guidelines require that an EIR provide a clearly written statement of the purpose of a proposed project. Section 15124 (b) of the state CEQA Guidelines requires a statement of the project objectives, including the underlying purpose of the project. NEPA regulations require a statement of "the underlying purpose and need to which the agency is responding in proposing the alternatives, including the proposed action" (40 CFR 1502.12).

1.2 Project Objectives

The Los Vaqueros Reservoir Expansion Project objectives are to use an expanded Los Vaqueros Reservoir system to:

Primary Objectives:

- Develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs.
- Increase water supply reliability for water providers within the San Francisco Bay Area, to help meet municipal and industrial water demands during drought periods and emergencies or to address shortages due to regulatory and environmental restrictions.

Secondary Objective:

- Improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area, without impairing the project's ability to meet the environmental and water supply reliability objectives stated above.

In addition to these objectives, CCWD Board of Directors' Resolution No. 03-24 provides important guidance for identifying and evaluating plans involving the expansion of the reservoir (CCWD, 2003). The CCWD Board Principles are discussed in detail in Chapter 2.

1.3 Purpose and Need

The primary project purpose is to use an expanded Los Vaqueros Reservoir system to develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs in the Delta and tributary river systems, and to improve water supply reliability for urban users in the San Francisco Bay Area.

The need for this project is driven by the following conditions:

- The Delta ecosystem is in a state of serious decline, with primary productivity very low and fish populations decreasing to record low levels, putting at least one species (the delta smelt) on the brink of extinction.
- Insufficient quantities of water and lack of storage and flexibility in managing the timing and location of diversions for environmental and municipal water supplies are contributing to the ecosystem's decline.
- Ecosystem decline has put other beneficial uses of water supplies conveyed through the Delta at risk, leading to court-ordered limits on Delta pumping and greatly reducing water supply reliability for millions of people.

Improved storage and conveyance of environmental water supplies can help to improve Delta ecosystem conditions and reduce conflict among beneficial uses of Delta water supplies.

1.4 Background on Need for Project

1.4.1 The Delta Supports Multiple Beneficial Uses

The Sacramento–San Joaquin Delta is an area of transition between the freshwater runoff from the Sacramento and San Joaquin Rivers and the tidally driven saltwater flows from the Pacific Ocean and San Francisco Bay. The San Francisco Bay/Sacramento–San Joaquin Delta estuary is the largest estuary on the West Coast. It is a complex system of rivers, sloughs, islands, open water areas, and constructed features such as barriers, tide gates, and water diversion pumps. A number of smaller tributaries also flow into the Delta. Additional inflows derive from agricultural and municipal wastewater discharges within the Delta and upstream.

The Delta is critical to California's economy, supplying drinking water for more than two-thirds of Californians and irrigation water for about 7 million acres of highly productive agricultural land. The Delta is also a key component of California's two largest water distribution systems: the CVP, operated by Reclamation, and the SWP, operated by DWR. Both the federal and state systems pump water out of the southwestern Delta to agricultural and urban contractors in the Bay Area and in central and southern regions of the state.

The Bay and Delta are habitat for a rich ecosystem of aquatic, terrestrial, and avian species, including more than 30 species protected under federal and state regulations. The aquatic habitat supports anadromous fish such as chinook salmon and steelhead trout that pass through the Delta on their way to the ocean and back to upstream rivers to spawn, as well as many resident species such as delta smelt that live their entire lives in the Delta. All these species are susceptible to flow and water quality conditions in the Delta. Additionally, the Delta supports an extensive sport and commercial fishery.

1.4.2 Declining Delta Ecosystem

Annual monitoring of fish abundance since 2000 includes record lows of delta smelt and young striped bass, and near-record lows of longfin smelt and threadfin shad (Resources Agency, 2007). In its January 2008 progress report, the Pelagic Organism Decline work team wrote: "Although several species show evidence of long-term declines, the recent low levels were unexpected given the relatively moderate winter-spring flows of the past several years" (Baxter, et al, 2008). The decline in multiple species with different life histories makes the changes during this period particularly concerning. Low abundance of these species remained through 2006 despite moderate to wet hydrologic conditions (Baxter, et al, 2008).

Many factors have been cited for the decline of the Delta ecosystem generally, and for fish species in particular including: invasive species; low primary productivity (phytoplankton); increasing temperatures; reduced and altered timing of inflows to the Delta; increased and altered timing of exports from the Delta; declining water quality due to increased discharges from wastewater treatment plants, agricultural drains, industrial operations, and non-point sources; changes in physical and chemical parameters such as flow and salinity; and loss of wetlands and

floodplains to urbanization and agricultural land conversion (see, e.g., Healey, 2007 and Baxter, et al, 2008).

On December 14, 2007, U.S. District Court Judge Oliver Wanger issued an Interim Order curtailing water exports from the Delta to protect delta smelt, a native species on the brink of extinction (NRDC, *et al* v. Kempthorne, *et al,* U.S. District Court, Eastern District of California, No. 1:05-cv-1207 OWW GSA). In this order, Judge Wanger set flow requirements designed to prevent extinction of delta smelt and avoid adverse modification of critical habitat. Meeting the flow requirements has necessitated CVP and SWP pumping curtailments that reduce the reliability of water supplies delivered to urban and agricultural water users dependent on these pumps. The CVP and SWP pumping reductions ordered in this decision were part of interim actions to protect fish until a new biological opinion could be issued by the U.S. Fish and Wildlife Service (USFWS) (Delta Export Restrictions). That biological opinion was issued on December 15, 2008 (USFWS, 2008).

The analyses pertaining to operation of the SWP and CVP in this document are based on the Interim Order and the 2004 plan for coordinated operations of the SWP and CVP, known as the Operations Criteria and Plan. Once a new opinion on salmon and steelhead is issued by the National Marine Fisheries Service (NMFS) (expected in mid-summer 2009), Reclamation and DWR intend to complete an analysis of the effects that the new biological opinions will have on the operation of the SWP and CVP. It is possible that the new opinions may result in moderate to severe fishery restrictions being imposed on Delta exports, depending on annual hydrologic conditions, above and beyond those caused by the Interim Order. The analysis of the effects of the new biological opinions on operations of the SWP and CVP will be described in the Final EIS/EIR for this project.

1.4.3 Insufficient Water Supply for Environmental Purposes

Public Law 102-575, the CVP Improvement Act (CVPIA), was enacted in 1992 to "protect, restore, and enhance fish, wildlife and associated habitats in the Central Valley and Trinity River basins of California" as well as to improve the operations flexibility of the CVP. It contains numerous requirements to modify CVP operations to ensure in-stream flows, carry-over storage, and temperature control to protect and restore, in particular, anadromous fisheries.

During dry periods, the CVP has difficulty meeting these requirements while still meeting contractual water supply obligations. As stated above, additional protective measures may be required in the new biological opinion being prepared by NMFS to address the effects of operation of the CVP and SWP on salmon and steelhead. The new opinion was required by the 2008 court decision in *Pacific Coast Federation of Fishermen's Associations v. Gutierrez* which invalidated the 2005 biological opinion. The new opinion is expected in mid-summer 2009.

One of the specific actions required under the CVPIA is provision of "firm water supplies of suitable quality to maintain and improve wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California" (CVPIA Section 3406(d)(1)). The CVPIA required about 430 TAF of CVP yield be delivered as base refuge supply. These arrangements were addressed

in long-term contracts between Reclamation and the Grassland Resource Conservation District, the California Department of Fish and Game and the USFWS.

The Act also set a target for supplying an additional 130 TAF of Incremental Level 4 refuge water within 10 years. This water was to be acquired through measures that do not require involuntary reallocations of CVP yield. Reclamation, in cooperation and coordination with the USFWS, implements the CVPIA Water Acquisition Program to acquire supplies to meet this and other environmental water requirements under the CVPIA. The program attempts to purchase or otherwise acquire as much of the target supply of 130 TAF as is available on the water market, to the extent of available funds, to meet optimal waterfowl habitat management needs and to support in-stream flows. The program purchases water through both short and long-term agreements, relying on market mechanisms to acquire water assets.

Reclamation has been able to secure some, but not all, of the supplemental refuge water supply for these wetland habitat areas (Reclamation, 2006). Constraints in meeting the target include budget constraints, cost and availability of water, pumping capacity at the Delta facilities, storage, and conveyance infrastructure.

1.4.4 Lack of Management Flexibility

The existing state and federal water systems lack flexibility in terms of when, where, and how water is pumped from the Delta. This lack of flexibility adds to the difficulty of addressing fish impacts, ecosystem decline, and supply reliability problems. CALFED's EWA Program is an example of an environmental water program aimed at protecting Delta fish species by increasing flexibility in SWP and CVP operations. The EWA has operated since 2001 and has been authorized by Congress through September 30, 2010. The EWA is intended to provide water "to augment streamflows, Delta outflows, to modify exports to provide fishery benefits and to replace the regular project water supply interrupted by the changes to project operations." (CALFED, 2000)

EWA performance was evaluated by CALFED in 2007. An important finding about the existing EWA program that could be applied to future EWA or other environmental water programs was that the lack of storage for EWA water assets south of the Delta is a serious constraint on EWA management and affects the ability to make the best use of the water for environmental purposes (CALFED, 2007). Additional storage capacity, along with the means to fill that storage without relying on the SWP and CVP Delta pumps, and to convey the stored water to offset Delta export curtailments, would substantially benefit the management of environmental water in the Delta and provide improved fishery conditions over and above those required by permits.

1.4.5 Decreasing Supply Reliability

Bay Area water agencies rely heavily on water supplies conveyed through the Delta to meet their normal year demands as well as prepare them for drought periods. CCWD customers receive almost 90 percent of their supply from the Delta while the three South Bay water agencies that receive SWP water – ACWD, SCVWD and Zone 7 – each receive about 40 to 65 percent of their supply from the Delta (ACWD, 2005; SCVWD, 2005; Zone 7, 2005). All of these agencies have long-term water supply plans to provide for their customers into the future under normal conditions and

during extended droughts and emergencies. Each agency has a diversified water supply portfolio including resource management strategies such as increased conservation, water recycling, desalination of brackish groundwater, and water banking.

ACWD, SCVWD, and Zone 7 also each have local groundwater basins that provide additional storage for conjunctive use of surface water. Local groundwater supply and storage gives these three agencies valuable flexibility and time to respond to droughts and emergencies. Still, Delta water remains an essential component of each of their water supply plans.

In the San Francisco Bay Area, water supply reliability can be adversely affected by the effects of droughts and emergencies, and by regulatory actions taken to protect Delta fish that result in constraints on pumping water from the Delta. For example, in February 2008, DWR notified SWP contractors that they would receive just 35 percent of their requested supplies in 2008. The allocation, which is significantly less than the 60 percent of requested supplies initially projected for calendar year 2008, takes into consideration current water supply conditions and SWP operational constraints, including the federal court-ordered 2008 Delta Export Restrictions to protect delta smelt.

The level of Delta supply reduction resulting from both dry-year conditions and regulatory actions experienced in 2008 will greatly affect the Bay Area water supply agencies if it extends to multiple years, such as occurred during the droughts of 1928 through 1935, 1976 through 1977, and 1987 through 1992. Local supplies, such as groundwater and locally stored runoff, drop during extended dry periods. At the same time, SWP deliveries can be reduced from an average of 63 percent of the contracted water supply (SWP Table A[1]) to about 6 percent of the contracted water supply during a single dry year with conditions similar to those in 1977 (DWR, 2008). A 4-year drought, similar to the period of 1931 to 1934, with the 2008 Delta Export Restrictions in place, would result in reductions of SWP deliveries to about 34 percent of full Table A deliveries.

Other factors also can limit water supply. Catastrophic emergency events with the potential to affect the Delta and the delivery of Delta water supplies include earthquakes, chemical spills, levee failures, and other events that have the potential to disrupt individual or multiple water conveyance facilities such as aqueducts, tunnels, and pump stations. More than 1,100 miles of levees, mostly un-engineered earthen berms, are deteriorating. This deterioration increases the risk of catastrophic failure, which could result in long-term disruption of water supplies as well as significant losses from flood damage to agricultural land and critical infrastructure in the Delta (including aqueducts, railroads, highways, gas and petroleum pipelines and power facilities). In addition, the likely consequences of climate change on the Delta are still being evaluated, but it is clear that climate change is a new and significant uncertainty factor in all Delta resource management activities.

[1] The contracts between DWR and the 29 SWP contractors define the terms and conditions governing water delivery and cost repayment for the SWP. Table A refers to an exhibit to each water supply contract. It governs the contractual method for allocating available supply and for allocating some of the costs among the contractors. The total of all Table A amounts for deliveries from the Delta is 4.133 MAF (million-acre-feet) per year. Each contract's Table A amount is the volume in acre-feet that is used to determine the portion of available supply to be delivered to that contractor each year (DWR, 2008).

1.4.6 Declining Drinking Water Quality

Delta water quality for drinking water supplies has generally declined because of saltwater intrusion resulting from water resources management actions; polluted runoff from urban, agricultural, and other land development; and changes in the physical environment. Seasonal variations as well as longer-term degradation of Delta water quality result in elevated salinity, total dissolved solids, bromide, total organic carbon, algae concentrations, and high levels of hardness and turbidity, which can affect treatment cost and effectiveness, taste and odor, and health considerations.

1.5 Improving the Delta Ecosystem, Water Supply Reliability and Water Quality

Over the last 15 years, the federal and state governments together with numerous stakeholders have embarked on several large-scale programs to protect, improve, and better balance competing uses in the Delta. The most comprehensive of these efforts are CALFED and the Delta Vision process. Common to these two programs is recognition that both a healthy Delta ecosystem and a reliable water supply are necessary for a sustainable future in the State of California. Also common to both of these programs is recognition that key to any sustainable solution to the Delta crisis is increased storage and flexibility to manage the water supply system to optimally deliver water to meet environmental needs as well as urban and agricultural needs.

1.5.1 Improving Environmental Water Management and Water Supply Reliability

The Los Vaqueros Reservoir Expansion Project would provide storage and conveyance capabilities to help achieve these objectives. The proposed project facilities would be operated in a coordinated fashion with the SWP and CVP facilities to improve fishery protection, habitat management and supply reliability. Depending on the alternative selected, the project could contribute to the dual and interrelated goals of a healthy Delta ecosystem and a reliable water supply in multiple ways, as follows:

- **The Los Vaqueros Reservoir Expansion Project would develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental water needs:**

    - Fish Protection through Improved Fish Screening. All water diverted through reservoir expansion project facilities would be through intakes equipped with state-of-the-art positive barrier fish screens designed and operated to regulatory agency specifications. The SWP and CVP pumps do not have positive barrier fish screens but instead use salvage facilities that can result in significant fish mortality. Diverting water through Expanded Los Vaqueros Reservoir system intakes would result in less impact to fish than the same amount of water diverted from either the SWP or CVP export facilities. This is because the scale of the diversions is much smaller, new technology fish screens are highly effective at preventing entrainment, and the intakes are in areas where fish screen sweeping flow criteria can be met.

- Fish Protection through Water Management Flexibility. The Los Vaqueros Reservoir Expansion Project would increase water management flexibility by adding storage and developing multiple intakes. Increased storage allows diversions from the Delta into the expanded Los Vaqueros Reservoir system to be reduced or eliminated during the most sensitive fish period without disrupting supplies. Current requirements for Los Vaqueros Reservoir operations include a no-diversion period during the most critical spring fish period. During this period, CCWD ceases pumping from the Delta and relies on the water stored in the reservoir for deliveries to its customers. All the alternatives evaluated in this document include a similar no-diversion period during which water is delivered from the expanded Los Vaqueros Reservoir in lieu of pumping from the Delta, protecting fish when they are most vulnerable.

  Multiple intakes, coupled with additional storage capacity, would improve water management flexibility to respond to changing fishery conditions in the Delta. With these facilities, the timing and/or location of water diversions would be coordinated with the CVP and SWP and adjusted to avoid sensitive periods and locations for fish.

- Dedicated Storage for Environmental Water. Storage capacity dedicated to water supply for environmental purposes (environmental water) provides an opportunity to secure more water for environmental purposes than is now possible, potentially at lower cost, and ensures that this water can be reserved until called upon to support environmental water needs. Water reserved in storage for environmental purposes can be used in many ways such as altering timing of pumping to avoid sensitive periods for aquatic species while maintaining water deliveries, increasing river flows when needed for spawning or migrating fish or delivering supply to managed wildlife refuges[2] that support extensive wetlands and waterfowl populations. The reservoir expansion project could establish dedicated storage for environmental water.

- **The Los Vaqueros Reservoir Expansion Project would increase water supply reliability for the Bay Area:**

  - Increased Reliability through Water Management Flexibility. The same system flexibility to change the location and/or timing of diversions in coordination with the SWP and CVP that would reduce impacts to fish (noted above) would also increase supply reliability. Having multiple points of diversion in the Delta means that, at times, while one diversion location needs to be closed to protect fish, another can remain open, allowing some level of supply delivery to be maintained. With additional storage, demands can be met with releases from the reservoir even when Delta diversions are curtailed to avoid sensitive fish periods and protect environmental resources.

  - Increased Reliability through Expanded Storage. An expanded Los Vaqueros Reservoir system could be used to partially restore delivery reductions for ACWD, SCVWD and Zone 7 due to regulatory restrictions at the SWP and

[2] The CVP Improvement Act (1992) requires the Secretary of Interior, through Reclamation and U.S. Fish and Wildlife Service, to operate the CVP for project purposes including fish and wildlife protection, restoration, enhancement and mitigation as well as power generation, irrigation and domestic water use. One of the programs required to further these purposes is the refuge water supply program. Under this program, specific amounts of water are to be provided to certain Central Valley wildlife refuges. This water cannot always be provided due to a variety of constraints including cost and availability of water, pumping capacity, storage, and conveyance infrastructure.

CVP Delta pumps to protect fisheries. The expanded storage capacity would also allow additional water to be reserved from one year to another to respond to drought periods and emergencies. An expanded reservoir could provide as much as 235 TAF of storage capacity on average that could be available to Bay Area communities during emergencies.

1.5.2 Improving Drinking Water Quality

A secondary objective of the reservoir expansion project is to improve the quality of water deliveries to municipal and industrial customers in the San Francisco Bay Area, without impairing the project's ability to meet the environmental water management and water supply reliability objectives.

The existing quality of water supplies from the Delta has generally declined because of saltwater intrusion resulting from water resources management actions; polluted runoff from urban, agricultural, and other land development; and changes in the physical environment. Seasonal variations as well as longer-term degradation of Delta water quality result in elevated salinity, total dissolved solids, bromide, total organic carbon, and algae concentrations and high levels of hardness and turbidity. As a result, some drinking water supplies originating in the Delta are subject to water treatment challenges for utilities; taste and odor problems for consumers; and increased health risks for certain populations. At the same time, water quality regulations are becoming more restrictive, requiring agencies supplied from the Delta to continue to strive to improve the quality of water they divert so, in turn, they can improve the quality of water delivered to their customers.

The reservoir expansion project could provide incidental improvements in the quality of Delta water provided to Bay Area water agencies that receive deliveries from the South Bay Aqueduct. Salinity levels would be reduced in South Bay Aqueduct deliveries in dry periods as a result of storing water in Los Vaqueros Reservoir at times when water quality is high, and then providing that higher quality water in lieu of direct diversions from the Delta when water quality is poor. The reservoir expansion project could also improve other aspects of water quality for the agencies on the South Bay Aqueduct, as the water delivered from Los Vaqueros Reservoir would no longer pass through Clifton Court Forebay, where algae growth in the warm, shallow, slow-moving water results in an increase in organic carbon content and taste and odor issues.

The expanded reservoir would also improve water quality for CCWD by providing a larger supply of high quality water stored in the reservoir to blend with Delta supplies in dry years.

CHAPTER 2
Project Background

This chapter provides an overview of the existing Los Vaqueros Reservoir facilities and operations, a history of the expansion project, a description of current Delta water supply facilities and operations, and a summary of ongoing planning and regulatory processes related to the Delta. This information provides context for understanding how expansion of the Los Vaqueros Reservoir could achieve the objectives outlined in Chapter 1, Purpose and Need.

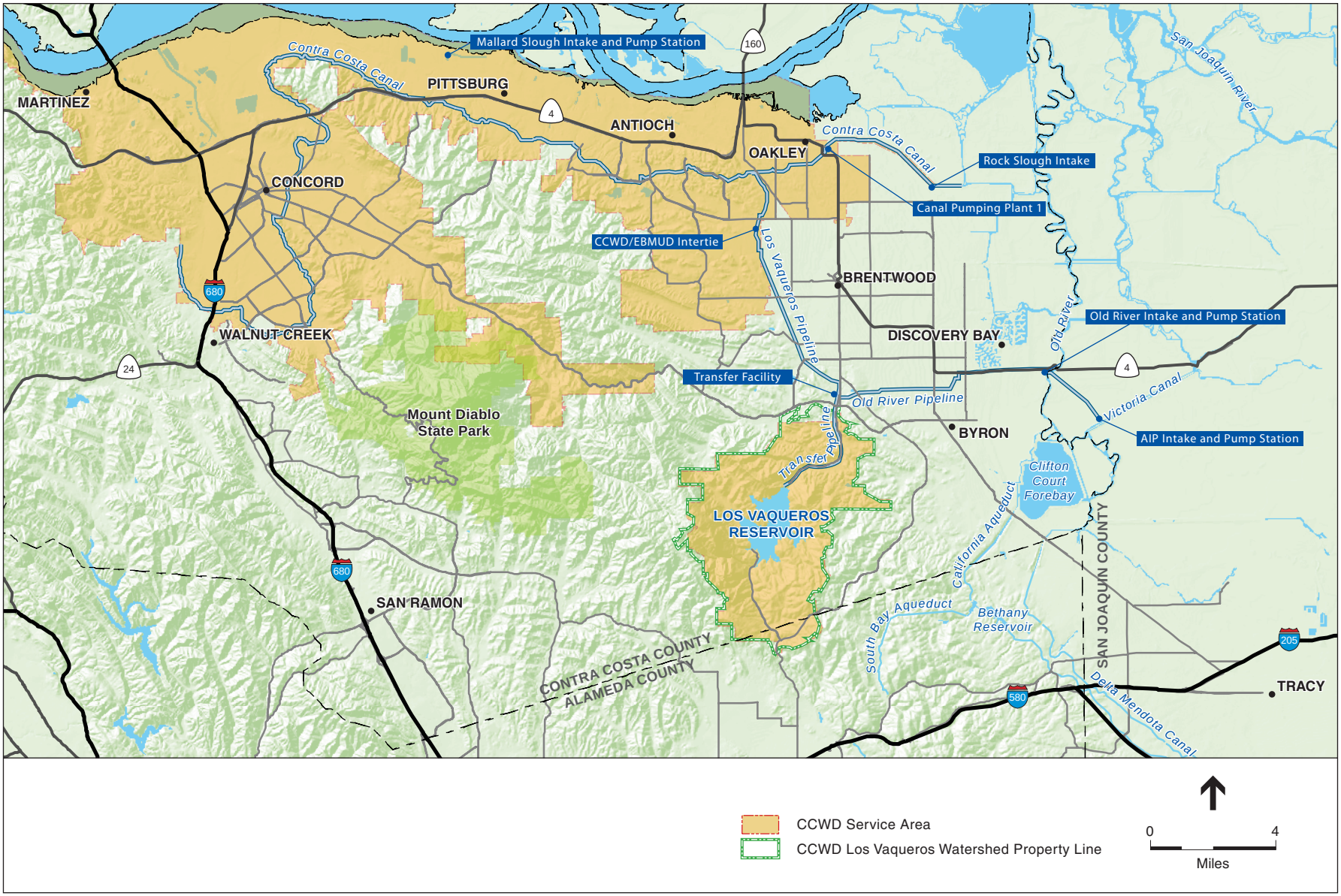
2.1 Existing Los Vaqueros Reservoir

The Los Vaqueros Reservoir is a 100 thousand-acre-foot (TAF) offstream storage reservoir in southeastern Contra Costa County owned and operated by the Contra Costa Water District (CCWD)[1]. The reservoir is operated to improve water quality and provide emergency storage for CCWD's 550,000 customers in central and eastern Contra Costa County. CCWD completed the reservoir and associated facilities (including a new intake on Old River near State Route 4 (SR 4)) in 1997. The reservoir facilities are operated as an integrated system with the Contra Costa Canal and Rock Slough Intake built as part of the federal Central Valley Project (CVP) in the 1940s. These facilities are described in more detail in the following sections. CCWD also owns the Los Vaqueros Watershed (watershed) which covers about 20,000 acres. The watershed lands are managed for water quality, conservation, and recovery of special-status species and their habitats, and recreation. The reservoir also provides flood control benefits on Kellogg Creek.[2] The CCWD service area, watershed lands, and major untreated water facilities are shown on **Figure 2-1**.

More recently, CCWD has constructed or is constructing two facilities that will be operated integrally with the reservoir: the CCWD-East Bay Municipal Utility District (EBMUD) Intertie, completed in 2007, and a new intake on Victoria Canal known as the Alternative Intake Project (AIP), currently under construction. These new facilities are also described in the following sections.

1 CCWD is a public agency formed in 1936 to provide water for irrigation and industry. CCWD is now one of the largest urban water districts in California, serving treated and untreated water to about 550,000 customers in Antioch, Bay Point, Clayton, Clyde, Concord, Martinez, Oakley, Pacheco, Pittsburg, and portions of Brentwood, Pleasant Hill, and Walnut Creek in Contra Costa County. CCWD's mission is to "strategically provide a reliable supply of high quality water at the lowest cost possible, in an environmentally responsible manner." CCWD receives most of its water through the federal CVP.

2 Although this benefit is infrequently realized, in 1998, a wet year, flows of 400 cubic feet per second (cfs) were produced in Kellogg Creek downstream of the reservoir; the reservoir held back an additional 400 cfs, thereby protecting the community of Byron and other downstream areas.



SOURCE: USGS, 1993 (base map); and ESA, 2005

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 2-1

CCWD Service Area and Major Facilities

2.1.1 Los Vaqueros Reservoir and Associated Facilities

Los Vaqueros Dam and Reservoir

The Los Vaqueros Dam is a 190-foot-high zoned earthfill embankment dam with a crest elevation of 487 feet above mean sea level. The volume of the dam embankment is about 2.85 million cubic yards. The reservoir occupies about 1,462 acres when full (about 100 TAF). A spillway is located on the left abutment and the inlet/outlet structure is located on the right abutment. The dam was designed to withstand the maximum credible earthquake of moment magnitude (M) 6.5 on the Greenville Fault, about 4 miles west of the dam. The dam is in full compliance with all requirements of the California Department of Water Resources, Division of Safety of Dams.

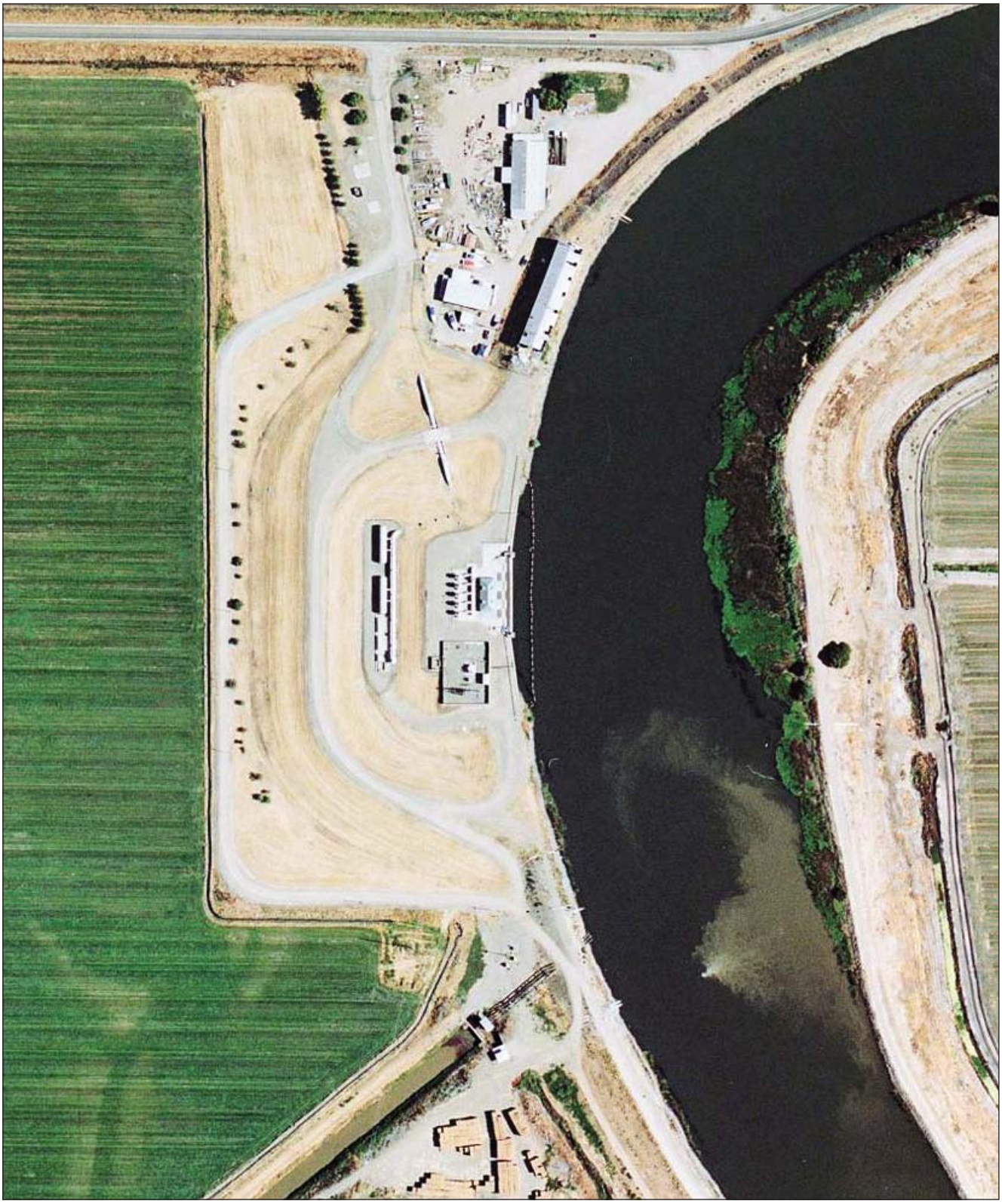
When the dam was originally designed, no measures were incorporated to facilitate raising the dam in the future, but recent engineering analysis has concluded that a limited raise is feasible. The amount of raise is limited by a combination of topographic constraints and the design of the dam. Raising the dam by the maximum amount considered feasible would allow the reservoir water surface to be raised 88 feet, which would create an additional 175 TAF of reservoir storage.

Old River Intake and Pump Station

The Old River Intake and Pump Station diverts water from Old River through a fish screen with an area of 1,250 square feet and delivers it to the Old River Pipeline. The pump station has five 2,100-horsepower pumps that deliver up to 250 cubic feet per second (cfs). The Old River Intake and Pump Station has a design capacity of up to 320 cfs. The additional 70 cfs in intake capacity could be realized by changing to higher horsepower pumps and adding fish screen panels. The facility is on a 16.8-acre site near SR 4 and Discovery Bay.

The Old River fish screen was designed to meet approach velocity criteria established by National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG). Specifically, the screen must have an average approach velocity of 0.2 foot per second (fps). The screen design was approved by NMFS as required in the 1993 Biological Opinion addressing the effects of the Los Vaqueros Project on winter-run chinook salmon. The screen is a vertical plate type, with stainless steel wedge wire screens with 3/32-inch vertical openings. It is oriented parallel to the ambient flow in Old River, allowing fish to move past the intake. It is equipped with a traveling rake automated cleaning system. A log boom and a debris deflector are also in place.

The Old River Intake and Pump Station fish screen facilities are shown in **Figure 2-2**. The Old River fish screen has successfully protected against entrainment since it began operation in 1997. In 11 years of monitoring, no salmon, one delta smelt, and one longfin smelt larva have been found to have passed through the screen.



SOURCE: GlobeXplorer, 2007; and ESA, 2007

Los Vaqueros Reservoir Expansion Project EIS/EIR . 201110

Figure 2-2

Existing Old River Intake and Pump Station

Old River Pipeline, Transfer Facility, Transfer Pipeline and Los Vaqueros Pipeline

The Old River Pipeline connects the Old River Intake and Pump Station to the Transfer Facility. The pipeline is about 34,700 feet long and 78 inches in diameter and can convey up to 320 cfs. The pipeline is in a CCWD-owned 85-foot-wide permanent right-of-way. From the Transfer Facility, water can be pumped up to the reservoir through the Transfer Pipeline, or allowed to flow down to the Contra Costa Canal through the Los Vaqueros Pipeline.

The Transfer Facility includes the following facilities:

- **Transfer Pump Station.** An 8,400-horsepower plant that delivers up to 200 cfs to the reservoir
- **Transfer Reservoir.** A 4-million-gallon reservoir that provides water storage for flow control operations
- **Flow Control Station #1.** Regulates flow from the Transfer Pipeline into the Los Vaqueros Pipeline

The Transfer Pipeline consists of about 19,600 feet of 72-inch-diameter pipe and connects the Transfer Facility to the reservoir. The Transfer Pipeline can convey up to 200 cfs from the Transfer Facility to the reservoir and up to 400 cfs from the reservoir to the Transfer Facility. The pipeline is in an 85-foot right-of-way.

The Los Vaqueros Pipeline connects the Transfer Facility to the Contra Costa Canal at the Neroly blending basin in Oakley. The pipeline consists of two continuous segments: the first is about 18,000 feet long with a 96-inch-diameter pipe and the second is 29,000 feet long with a 90-inch-diameter pipe. The pipeline is in an 85-foot right-of-way and has a capacity of 400 cfs. The Neroly blending basin includes a flow control station that dissipates excess water pressure from the pipeline in order to control the amount of water entering the canal. As part of CCWD's capital improvement program, an energy recovery system is being designed to capture the energy released in this process and transmit it to other CCWD facilities to offset existing electrical loads.

Contra Costa Canal and Rock Slough Intake

The Contra Costa Canal was completed by the U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region (Reclamation) in 1948. The canal is owned by Reclamation and operated by CCWD. The canal is the primary conveyance facility for CCWD's untreated water supply, carrying water from both the Rock Slough Intake and the Old River Intake (via the Los Vaqueros Pipeline) for deliveries to treatment plants, large industries, and irrigation customers throughout CCWD's service area. The canal is 48 miles long with capacities ranging from 350 cfs at the Rock Slough Intake to 22 cfs at its western terminus at the Martinez Reservoir. The first 4 miles of the canal are earth lined, while the remaining 44 miles are concrete lined. The earth-lined portion of the canal is subject to water quality degradation due to seepage into the canal from saline groundwater in the area. CCWD is undertaking a project to encase this portion of

the canal to stop the degradation. A series of four pumping plants lift the water from Rock Slough to 126 feet above sea level, after which the water flows by gravity to the terminus.

The Rock Slough Intake has a capacity of 350 cfs and is currently unscreened. Because water quality at Old River is generally better than at Rock Slough, and because the Old River Intake is screened, Rock Slough is used less frequently than it was before the Los Vaqueros Reservoir was completed. When AIP is operational, use of Rock Slough will be reduced even further. However, the Old River Intake and AIP do not have sufficient capacity to meet all CCWD's demands now and in the future, so Rock Slough continues to be an important component of CCWD's system. Reclamation, in collaboration with CCWD, is responsible for constructing a fish screen at Rock Slough under the CVP Improvement Act and the 1993 USFWS Biological Opinion for the Los Vaqueros Project. Reclamation has received an extension on fish screen construction until December 2008, and is preparing a request for further extension until 2018 because the requirements for screen design will change when CCWD completes the ongoing project to encase the earth-lined portion of the canal.

Intertie with EBMUD

The EBMUD-CCWD Intertie connects the Los Vaqueros Pipeline with the Mokelumne Aqueduct in Brentwood, enabling CCWD to wheel a portion of its CVP contract water supply through Freeport Regional Water Authority (FRWA) and EBMUD facilities to the reservoir. Under an agreement between CCWD, EBMUD, and FRWA, CCWD can wheel up to 3,200 acre-feet per year through the intertie. The intertie also functions as an emergency connection between EBMUD and CCWD, enabling the districts to share water resources in an emergency or during planned outages. The capacity of the intertie is 155 cfs.

The Freeport Regional Water Project (FRWP) is currently under construction. Environmental review for the FRWP was completed in January 2005. Facilities include a water intake and pumping plant in the Sacramento River, a pipeline connecting to the Mokelumne Aqueduct, and a pumping plant at the southern end of the Folsom South Canal. Construction is expected to be completed in December 2009. When completed, EBMUD will take its dry-year CVP contract water through the FRWP.

Alternative Intake Project

The AIP adds a new 250-cfs intake on Victoria Canal that is connected to the Old River Pipeline via a 2.5-mile buried pipeline across Victoria Island and through a tunnel beneath Old River. The new intake will be equipped with a state-of-the-art positive barrier fish screen. The AIP fish screen has been designed to meet all standards set by NMFS, USFWS, and CDFG. The screen would have a maximum flow velocity of 0.2 fps at any flow level in Victoria Canal, 2/32-inch screen openings, and a mechanical cleaning system.

The AIP will increase CCWD's access to high quality water year-round, especially in the fall and during drought periods. It will also help to ensure that the investment CCWD customers have made in water quality improvements and infrastructure, including the reservoir, will be protected as

water quality in the Delta deteriorates. The AIP does not increase the total amount of water diverted from the Delta, but provides additional flexibility to optimize diversions to maximize water quality and fish protection. Environmental review for the AIP was completed in 2006. The AIP is expected to be operational in 2010.

Los Vaqueros Reservoir Facilities Power Supply

Power is transmitted to the Old River Intake and Pump Station over lines owned and operated by Western Area Power Administration (Western). A 230-kV line being operated at 69 kV runs from the Tracy substation near the CVP Jones Pumping Plant to the Old River Intake and Pump Station, and is being extended to the AIP. The delivered power is from one of two sources: CVP power and Modesto Irrigation District (MID) power. CVP power used by CCWD is exclusively hydroelectric power. MID power is generated from a variety of sources including renewables and large hydropower (48 percent), coal (28 percent), and natural gas (24 percent) (Smith, 2007). Power needs at the Transfer Facility and within the watershed are met by Pacific Gas & Electric (PG&E) through their Brentwood substation. PG&E's portfolio includes natural gas (40 percent), renewables and large hydropower (34 percent), and nuclear (24 percent) (PG&E, 2008).

Los Vaqueros Watershed Recreation Facilities

Recreational facilities that provide both water-oriented and upland recreational opportunities were constructed and have been operated since 2001. These include 55 miles of trails, a marina, fishing piers, an interpretive center, and picnic areas. Recreation facilities and programs are managed in a manner consistent with the Resource Management Plan adopted by the CCWD Board of Directors in 1999 and with biological opinions issued by USFWS and CDFG covering San Joaquin kit fox, bald eagle, California red-legged frog, and Alameda whipsnake, among other threatened and endangered species in the watershed.

2.1.2 Los Vaqueros Reservoir Operations

CCWD operates the reservoir together with its intakes to provide high quality, low-salinity water to its customers. In winter and spring, when the Delta is relatively fresh (generally January through July), customer demand is supplied by direct diversion from the Delta. In the late summer and fall months, CCWD releases water from the Los Vaqueros Reservoir to blend with higher-salinity direct diversions from the Delta to meet CCWD water quality goals. The reservoir is re-filled during winter and spring, when chloride concentrations at Old River are low, generally less than 50 milligrams per liter (mg/L).

The reservoir is operated in a manner consistent with the biological opinions for the reservoir, which require numerous fish protection measures, including an annual 75-day "no-fill" period and a concurrent 30-day "no-diversion" period. The default dates for the no-fill and no-diversion periods are March 15 through May 31 and April 1 through April 30, respectively; USFWS, NMFS, and CDFG can change these dates to best protect covered species. Customer demand during the no-diversion period is met through releases from the reservoir. CCWD also

preferentially uses the screened Old River Intake over unscreened Rock Slough from January through August to further protect fish.

CCWD diverts unregulated flows and regulated flows from CVP storage facilities releases as a contractor of Reclamation's CVP. Under Water Service Contract No. I75r-3401A-LTR1 (renewed May 10, 2005) with Reclamation, CCWD can divert and re-divert up to 195 TAF per year of water from its Rock Slough and Old River intakes (and AIP under a letter approval from Reclamation expected in 2009) for direct use or to storage in Los Vaqueros Reservoir. CCWD also diverts from Old River to storage in the reservoir under its own Los Vaqueros water right permit (Permit No. 20749)[3].

Los Vaqueros Project Water Right (Permit No. 20749)

The terms and conditions governing CCWD's diversion to storage in Los Vaqueros Reservoir under Permit No. 20749 are given in California State Water Resources Control Board (SWRCB) Decision 1629 (D1629). D1629 provides that CCWD may divert water under Permit No. 20749 from Old River to Los Vaqueros Reservoir from November through June during excess conditions in the Delta, as defined in the State Water Project (SWP)/CVP Coordinated Operations Agreement, when those diversions will not adversely impact the operations of the SWP and CVP; CCWD may also divert water under its CVP water supply contract to storage in Los Vaqueros Reservoir throughout the year, subject to the operational restrictions discussed below. D1629 specifies the maximum diversion rates at 250 cfs and annual diversion to storage (95,800 acre-feet annually at a rate of 200 cfs) by CCWD to Los Vaqueros Reservoir.

CCWD's operations are governed in part by three biological documents: (1) 1993 NMFS Biological Opinion for winter-run chinook salmon, (2) 1993 USFWS Biological Opinion for Delta Smelt, and (3) 1994 Memorandum of Understanding between CDFG and CCWD regarding the Los Vaqueros Project. The biological documents specify the following:

- **No-Fill Period.** CCWD will avoid filling Los Vaqueros Reservoir for 75 days each spring. The default no-fill period is March 15 through May 31. This condition is also included in D1629.

- **No Diversion Period.** CCWD will avoid Delta diversions for 30 days each spring, concurrent with part of the no-fill period. The default no-diversion period is the month of April. This condition is also included in D1629.

- **Emergency Storage.** The no-fill and no-diversion restrictions are in effect only when Los Vaqueros Reservoir is above emergency storage levels. Emergency storage is defined as 70,000 acre-feet in below-normal, above-normal, and wet years, and 44,000 AF in dry and critical years. This condition is also included in D1629.

- **X2 Restrictions.** Los Vaqueros Reservoir may be filled when X2 (the location of the 2 parts-per-thousand salinity line) is west of Chipps Island in February through May, and Collinsville in January, June through August, and December. X2 restrictions on filling in December

[3] At the same time, the SWRCB also issued Permit No. 20750 to CCWD for diverting and storing the water from Kellogg Creek in Los Vaqueros Reservoir.

only exist when adult delta smelt are present at the Old River Intake. In 2005, CDFG and USFWS granted a temporary waiver on the July and August X2 restrictions, allowing 5 years to evaluate bringing CCWD's operating restrictions in line with D1641, during which X2 standards apply from February to June only.

Biological opinions issued for the AIP by both USFWS and NMFS integrate operations of the AIP into operations of the facilities previously described to minimize take of sensitive fish species. Under the USFWS biological opinion, the combined diversion rate of Old River Intake and AIP is 320 cfs.

Mallard Slough Water Right

CCWD has a license and a permit for diversions at Mallard Slough for up to 26,780 AF per year. However, Mallard Slough diversions are unreliable during most of the year because of high salinity in the San Joaquin River at the point of diversion. Over the last 10 years, diversions by CCWD from Mallard Slough have averaged less than 3,000 AF per year. Diversions from Mallard Slough substitute for other diversions, principally CVP supplies from Rock Slough.

Water use within CCWD's service area is currently between 125 and 140 TAF per year, depending on weather conditions. These demands are met with a combination of reservoir releases and direct diversions of CVP contract water, as well as diversions under other water rights held by CCWD customers for their own use (e.g., the City of Antioch has its own pre-1914 water rights), groundwater, conservation, and recycled water. **Table 2-1** shows water use by source with the CCWD service area.

TABLE 2-1
WATER USE WITHIN THE CCWD SERVICE AREA BY WATER SOURCE (ACRE-FEET)

	CVP direct diversion	Releases from Los Vaqueros Reservoir[a]	Other Water Rights[b]	Ground-water[c]	Recycled water	Water Transfer Purchases	Total water use	Quantifiable Direct and Other Conservation[d]
2006	90,800	10,850	9,750	1,450	7,600	2,300	122,750	3,300; 30,000
2007	73,100	34,900	4,800	2,170	8,700	7,000	130,670	3,400; 30,000

a Los Vaqueros water rights water
b Other water rights include CCWD's Mallard Slough water rights and diversions by the City of Antioch.
c Groundwater usage of Diablo Water District, Golden State Water Company, and City of Pittsburg.
d The first figure is estimated savings from CCWD conservation programs that are directly quantifiable. Savings related to plumbing codes, regulation, changing industry standards, or actions taken by CCWD and its customers for which the savings are not directly quantifiable are estimated to be 30,000 acre-feet annually.

Between 44 TAF and 70 TAF of reservoir capacity is used for emergency storage (depending on hydrological conditions) that would provide from 3 to 6 months of supply for CCWD at current demand levels during times when water from the Delta is unavailable due to natural disaster, toxic spill, levee failure, or other significant event.

CCWD Water Quality Goals

CCWD's long-term water quality goal is to deliver water with chloride concentrations of 65 mg/L or less to its customers. To achieve this delivered quality, reservoir filling usually targets water with less than 50 mg/L of chloride. On average, chloride concentrations in the reservoir are about 35 mg/L. Reservoir water released from storage is blended with water from Old River and Rock Slough intakes that can have chloride concentrations as high as 210 mg/L and 275 mg/L, respectively, depending on season, annual hydrology, discharges to and exports from the Delta; by blending, CCWD is able to deliver high quality water to its customers throughout the year.

Other source water quality constituents of concern for CCWD due to its reliance on Delta water include bromide, total organic carbon (TOC), and pathogens. Delta water must be disinfected to meet federal drinking water regulations, which impose stringent limits on disinfection by-products in treated water. Bromide and TOC are precursors of regulated disinfection by-products. Currently, CCWD's primary means of ensuring that disinfection by-product standards are met in the treated water is to ensure that bromide and TOC levels in the source water from the Delta are maintained below certain levels (reducing the need for disinfectant, and the resulting by-products). Bromide levels in the Delta correspond closely to chloride levels; thus, by managing for chloride, CCWD effectively manages for bromide. CCWD's source water quality goal for bromide is 50 micrograms per liter. TOC levels in the Delta vary seasonally and tend to increase during periods when chloride and bromide are decreasing. CCWD's source water quality goal for TOC is less than 3.0 mg/L. When necessary, CCWD reduces high TOC levels by the addition of coagulant at its treatment plants.

CCWD monitors for all of these constituents, as well as turbidity, algae, and taste and odor-causing compounds and adjusts operations daily to meet its water quality goals.

2.1.3 CCWD Long-Range Water Supply Planning

CCWD conducts long-range water supply planning in coordination with its wholesale customers and the cities to which it provides retail water service. This plan, the Future Water Supply Study (FWSS), identifies the specific sources and programs CCWD plans to implement to accomplish its mission of providing a reliable supply of high quality water at the lowest cost possible, in an environmentally responsible manner (CCWD, 1998). In addition to the surface water supplies obtained through its CVP contract and its Los Vaqueros and Mallard Slough Water Rights, CCWD has identified conservation, recycled water, and water transfers as other important sources of supply in the FWSS.

In 1999, CCWD certified a program-level Environmental Impact Report (EIR) addressing the impacts of implementing the FWSS (Future Water Supply Implementation (FWSI) EIR) (CCWD, 1999). The FWSI EIR assessed the broad environmental effects associated with conserving water and providing additional water supplies to meet the demands of growth and diverting additional water from the Delta. The effects of individual implementation projects, such as specific water transfers, were not covered in this programmatic document, although the effects of programmatically providing sufficient supplies for the growing population were covered. A key

element of the FWSS was that implementation would be accomplished incrementally so that growth was not encouraged beyond that which was already planned and permitted by local land use agencies with land use authority.

CCWD also consulted with USFWS and received a biological opinion for the FWSI in conjunction with an infrastructure project being undertaken at the same time (the Multi-Purpose Pipeline) (USFWS, 2000). A conservation measure in the Biological Opinion required CCWD to initiate and help fund a Habitat Conservation Plan for the East Contra Costa County area to offset the effects of urban development on listed and proposed plant and wildlife species in east Contra Costa County. CCWD was also required to ensure that the proponents for annexation to CCWD had all environmental approvals in place, including approval from USFWS, before providing CVP water.

2.2 Development of the Los Vaqueros Reservoir Expansion Project

The Los Vaqueros Reservoir Expansion Project (reservoir expansion project) is a multi-agency effort that would provide local, regional, and state-wide environmental, water supply, and water quality benefits. The project grew out of the comprehensive federal/state cooperative program known as CALFED Bay-Delta Program (CALFED) that seeks to improve the quality and reliability of California's water supplies while restoring the Bay-Delta. In August 2000, CALFED published the CALFED Record of Decision, which laid out a plan for restoring the Bay-Delta ecosystem and improving water supply reliability and water quality. Expansion of Los Vaqueros Reservoir was included as one of five water storage programs identified for further investigation. Since that time, CCWD, Reclamation, and the California Department of Water Resources (DWR) have developed and refined the Los Vaqueros Reservoir Expansion Project through detailed studies and extensive public outreach.

2.2.1 Project Leadership

CCWD, as owner-operator of the reservoir, is the lead agency under the California Environmental Quality Act (CEQA) and has been managing the reservoir expansion project studies with funding from both Reclamation and DWR. Reclamation is the lead agency under the National Environmental Policy Act (NEPA). Reclamation's involvement is authorized by Congress through Public Laws 108-7 and 108-361, which authorized Reclamation to undertake a feasibility study of expanding the reservoir and to pursue its development, along with other ongoing environmental and storage projects, in a balanced manner. DWR's interest in the reservoir expansion project started with the state's commitment to the CALFED Storage Program and continues based on recognized needs to restore reliability to SWP contractors in the Bay Area while meeting CALFED goals of ecosystem restoration in the Delta.

Many federal, state, and local agencies participate in the reservoir expansion project through the Los Vaqueros Memorandum of Understanding (LV MOU) regarding preliminary studies (feasibility studies, environmental review, and preliminary design) for the reservoir expansion project. The LV MOU agencies are periodically updated on project development through an

Agency Coordination Work Group, and are given opportunities to review and comment on early drafts of studies. This early involvement helps ensure that these studies provide the LV MOU agencies with information relevant to future decisions they may make related to the reservoir expansion project such as granting a permit or becoming a beneficiary (DWR et al., 2001).

Western is a cooperating agency under NEPA and will rely on this document in making decisions regarding providing power to new and expanded facilities proposed as part of the reservoir expansion project.

2.2.2 Project Approval Process

Approving one of the Los Vaqueros Reservoir Expansion Project alternatives evaluated in this Environmental Impact Statement (EIS)/EIR will require completion of the CEQA/NEPA process by the lead agencies, a determination by the CCWD Board of Directors that the proposed project is consistent with their adopted Principles for Expansion (set forth below), and decisions by potential beneficiaries as to the nature and extent of their participation. The latter decisions depend in part on the outcomes of federal and state feasibility studies and regional evaluations of benefits and costs, being conducted by the potential participants in parallel with the environmental review process.

CCWD Board Principles for Expansion

In June 2003, the CCWD Board of Directors adopted a set of principles by which CCWD would consider participating in a proposal for a Los Vaqueros Reservoir Expansion Project[4]. The Board will consider participating in an expansion project if it meets the following conditions:

1. Improves drinking water quality for CCWD customers beyond that available from the existing Los Vaqueros Project;

2. Improves the reliability of water supplies for CCWD customers during droughts;

3. Enhances Delta habitat and protects endangered Delta fisheries and aquatic resources by installing state-of-the-art fish screens on all new intakes and creating an environmental asset through improved location and timing of Delta diversions and storage of water for environmental purposes;

4. Increases the protected land and managed habitat for terrestrial species in the Los Vaqueros Watershed and the surrounding region;

5. Improves and increases fishing, boating, hiking, and educational opportunities in the Los Vaqueros Watershed, consistent with the protection of water quality and the preservation of the watershed and the watershed's unique features;

6. CCWD continues as owner and manager of the Los Vaqueros Watershed;

[4] These CCWD Board Principles expand upon an earlier set of principles from April 2000 that were directed at formulating the concept of a Los Vaqueros Reservoir expansion. As a result of preliminary engineering and environmental studies, CCWD determined that an expansion project could be defined that met its principles. The 2003 CCWD Board Principles provide guidance for continued refinement of such an expansion project and provide conditions for CCWD's participation.

7. CCWD maintains control over recreation in the Los Vaqueros Watershed;

8. CCWD continues as operator of the Los Vaqueros Reservoir system;

9. CCWD will be reimbursed for the value of the existing Los Vaqueros Project assets shared, replaced, rendered unusable, or lost with the expansion project and said reimbursement will be used to purchase additional drought supply and water quality benefits or reduce debt on the existing Los Vaqueros Project;

10. Water rates for CCWD customers will not increase as a result of the expansion project.

In March 2004, the CCWD Board of Directors placed an advisory measure on the ballot asking voters in its service area whether CCWD should expand the Los Vaqueros Reservoir under these principles. The measure won approval of 62 percent of voters.

2.2.3 Los Vaqueros Reservoir Expansion Studies to Date

The planning phase of the Los Vaqueros Reservoir Expansion Project began in January 2001. Most of this early work focused on determining whether an expanded reservoir could meet state and federal program goals (i.e., CALFED goals) and the CCWD Board Principles. The Project Concept Report prepared by CCWD in 2002 was the first report to present preliminary information on initial alternatives and potential benefits of the expansion project (CCWD, 2002). As alternatives were better defined, a federal feasibility study was started. Some of the preliminary analyses for the federal feasibility study have been published as separate studies, such as the Initial Economic Evaluation for Plan Formulation Report (IEEPF) summarized below (Reclamation, 2006). The EIS/EIR process began with publishing the Notice of Intent (NOI) in the Federal Register in December 2005 and issuing the Notice of Preparation (NOP) in January 2006. The studies or publications summarized here can be accessed on the project web site at www.lvstudies.com.

Feasibility-Related Studies

April 2004 Final Draft Planning Report. The Final Draft Planning Report prepared by CCWD presents the information developed during this planning phase of the Los Vaqueros Reservoir Expansion Studies and incorporates comments received to date (CCWD, 2004).

September 2005 Initial Alternatives Information Report (IAIR). The primary purpose of the IAIR is to document the first phase of the Federal Feasibility Study for the Los Vaqueros Expansion Investigation (Reclamation, 2005). Specifically, this report describes formulation of initial alternative plans to address the identified problems, opportunities, and planning objectives that primarily involve enlarging the reservoir.

July 2006 IEEPF. As part of the Federal Feasibility Study, Reclamation published the IEEPF which evaluates whether a project alternative could meet federal interests and therefore warrant continued federal funding. The report provides an economic and plan formulation update to support a federal decision. Based on this initial evaluation, the IEEPF concluded that expansion of Los Vaqueros Reservoir is cost effective and can be implemented while meeting the CCWD Board Principles.

EIS/EIR Process

December 2005 NOI. The NOI published by Reclamation in the Federal Register notified agencies of the preparation of the EIS for the project.

January 2006 NOP. The NOP published by CCWD described the proposed project alternatives under consideration for review in the EIS/EIR and identified the main environmental issues to be addressed during the environmental review. (Note that at the time of the NOP, the maximum size reservoir under consideration was 500 TAF. Based on preliminary feasibility and environmental studies, the maximum size reservoir now under consideration is 275 TAF. Other project facilities such as pumps and pipelines are commensurately smaller as well.)

Four public scoping meetings were held in January 2006 to solicit input on the EIS/EIR. A Scoping Report that documents the scoping meetings, the comments received and responses to the comments is included as Appendix A to this EIS/EIR.

2.3 Delta Water Supply Facilities and Operations

Many small water diversion facilities in the Delta serve in-Delta agricultural needs as well as some urban needs like CCWD's, but the most significant facilities due to their size and influence on Delta conditions, as well as the number of water users they serve, are the federal and state water supply facilities that export water for the CVP and the SWP, respectively. The following sections describe these two projects and give an overview of the coordinated operations of the projects. In-Delta water use is also summarized.

2.3.1 Central Valley Project

The federal CVP is the largest water storage and delivery system in California, with its facilities and service area extending over 29 counties. The CVP's features include 18 federal reservoirs, plus 4 additional reservoirs jointly owned with the SWP (primarily, San Luis Reservoir). **Figure 2-3** shows the locations of major CVP features.

The reservoirs in this system provide a total storage capacity of slightly over 12 million acre-feet (MAF), nearly 30 percent of the total surface storage in California, and deliver about 7.3 MAF annually to agricultural, urban, and wildlife uses. The keystone of the CVP is the 4.6-MAF Lake Shasta, the largest reservoir in California. Other key features include Friant Dam, Folsom Dam, New Melones Dam, Jones Pumping Plant (formerly known as the Tracy Pumping Plant), and the Contra Costa, Delta-Mendota, and Friant-Kern Canals, and the San Luis Unit. Construction of the CVP began in the late 1930's.

The CVP supplies water to more than 250 long-term water contractors in the CVP service area, whose contracts total 9.3 MAF. Of the 9.3 MAF, 3.1 MAF is water-right settlement water that is delivered to senior water-rights holders.

SOURCE: ESA, 2008

Figure 2-3
Major Components of the Central Valley Project

Water-right settlement water is water covered in agreements with water-rights holders whose diversions existed before the CVP was permitted and constructed. Because the construction of CVP reservoirs altered the natural flow of rivers upon which these diverters had relied, contracts were negotiated to serve stored water to the users to supplement river flows available under their rights. CVP water-right settlement contractors (called "prior right holders") on the upper Sacramento River receive their supply from natural flow and storage regulated at Shasta Dam; settlement contractors on the San Joaquin River (called "exchange contractors") receive Delta water via the Delta-Mendota Canal.

The remaining 6.2 MAF is delivered to water contractors as CVP project water supplies. About 90 percent of CVP water has gone to agricultural uses, including water delivered to the prior right holders. CVP water is used to irrigate some 19,000 farms covering 3 million acres. Currently, increasing quantities of water are being served to municipal customers. Urban areas receiving CVP water supply include Redding, Sacramento, Folsom, Tracy, most of Santa Clara County (served by Santa Clara Valley Water District (SCVWD)), north-central and eastern Contra Costa County (served by CCWD), and Fresno. With completion of the FRWP, CVP water supplies would be delivered to portions of Alameda and Contra Costa Counties served by EBMUD during drier years.

Water stored in the northern CVP reservoirs is released to the Sacramento River and eventually enters the Delta. Supplies contracted for delivery are diverted from the Delta via the Contra Costa Canal and the Delta-Mendota Canal. CCWD diversions were described above; the 4,600-cfs Jones Pumping Plant diverts water to the Delta-Mendota Canal. The other CVP supplies are diverted upstream of the Delta by CVP contractors such as Glenn-Colusa Irrigation District and Tehama Colusa Irrigation District. In the future, EBMUD, Sacramento County, and possibly other agencies will also divert CVP water from the Delta at Freeport.

During the winter, unstored water is diverted and conveyed to offstream San Luis Reservoir, on the western side of the valley, for subsequent delivery to the San Luis and San Felipe Units. A portion of the Delta-Mendota exports are returned to the San Joaquin River at Mendota Pool to serve (by exchange) water users who have long-standing historical rights to the use of San Joaquin River flow. This exchange enabled the diversion of a major portion of the flow farther south in the Friant-Kern Canal (and some water northward in the Madera Canal) through the construction of Friant Dam northeast of Fresno.

Operations of the federal facilities in the Delta are coordinated with the SWP to meet water quality and other standards set by the SWRCB, and more recently, pumping limits set by federal fish management agencies such as NMFS and USFWS, and by court order.

Central Valley Project Improvement Act

In 1992, Congress passed the CVP Improvement Act, which added fish and wildlife protection, restoration, enhancement, and mitigation as project purposes with equal priority to existing project purposes of power generation, irrigation, and domestic water uses. The CVP Improvement Act requires the Secretary of the Interior, through Reclamation and the USFWS, "to operate the

CVP consistent with the purposes of the act, to meet the federal trust responsibilities to protect the fishery resources of affected federally recognized Indian tribes, and to achieve a reasonable balance among competing demands for the use of CVP water" (Reclamation, 2005).

Reclamation and USFWS, in coordination with the State of California, participating CALFED agencies, and other partners, have implemented numerous programs to meet the goals of the Act. Two areas of focus have been increasing the number of anadromous fish in Central Valley rivers and streams, and supplying water to Central Valley refuges and other waterfowl habitats.

The goal of the anadromous fish program, as specified in section 3406(b)(1) of the CVP Improvement Act, was for the Department of the Interior "to make all reasonable efforts to at least double, by the year 2002, the "natural" production of six species of anadromous fish in Central Valley rivers and streams over the average levels that existed between 1967 and 1991" (Reclamation, 2005). Many of the programs implemented to achieve this goal focus on the Delta because many species and runs of anadromous fish pass through the Delta and because the Delta environment has been significantly altered in ways that impact fish habitat. The anadromous fish doubling program in the Delta emphasizes operational changes that result in increased stream flows and reduced diversions during sensitive periods for fish. Other measures include installation of a seasonal barrier at the head of Old River (Reclamation, 2005).

The goal of the CVP Improvement Act refuge water supply program is to provide "firm water supplies of suitable quality to maintain and improve wetland habitat areas" on certain Central Valley wildlife refuges (see section 3406(d)). The Act required about 430,000 acre-feet of base refuge supply to be provided immediately, and set a target for supplying an additional 130,000 acre-feet of supplemental water within 10 years. The base supply is routinely provided, but supplemental supplies are not fully provided due to a variety of constraints, including cost and availability of water, pumping capacity, and storage and conveyance infrastructure.

2.3.2 State Water Project

The SWP is the primary state entity for storing and conveying water to supply-deficient areas in California. Water is contracted to 29 local water agencies that are obligated to pay for the SWP's construction and continued operation. Of the 29 contractors, 25 use SWP water primarily for Municipal and Industrial (M&I) purposes, while the remaining 5 use SWP water for primarily agricultural purposes. The water supply contracts were originally entered into in the 1960s. Contracts were signed for an eventual annual delivery of 4.17 MAF (referred to in the contracts as "Table A" water). For the 10-year period from 1995 through 2004, average annual deliveries of Table A water were 2.4 MAF, with a maximum of 3.2 MAF and a minimum of 1.5 MAF (DWR, 2006).

Planning for the multipurpose SWP began in the late 1940s and early 1950s, when it became evident that local and federal water development could not keep pace with California's rapidly growing population. Passage of the Burns-Porter Act in 1960 authorized construction of the facilities. At that time, the plans recognized that there would be a gradual increase in water demand and that some of the supply facilities could be deferred until later. The SWP's major

components include Oroville Dam and Reservoir on the Feather River, the Edmund G. Brown California Aqueduct, South Bay Aqueduct, North Bay Aqueduct, and a portion of San Luis Reservoir (shared with Reclamation), as well as the Banks Pumping Plant and Clifton Court Forebay located in the Delta. The Banks Pumping Plant has a capacity of 10,300 cfs; however, due to regulatory restrictions imposed in SWRCB Decision 1641, the pumping capacity is typically limited to 6,680 cfs with some exceptions (DWR, 2008).

Figure 2-4 shows the major components of the SWP, which extend from the Feather River in the north to the East Branch Extension in Riverside County in the south.

In 2004, the SWP delivered 2.6 MAF of Table A supplies, and about 1.8 MAF of other water including water to meet obligations to water right holders on the Feather River (DWR, 2006). About 75 percent of the Table A deliveries serve M&I land uses, while the remaining 25 percent is delivered for agricultural supplies (DWR, 2006). The volume of water available for delivery to SWP water users varies annually according to hydrologic conditions and system operations.

DWR issued its *SWP Delivery Reliability Report 2007* in August 2008. The report indicates the probable volumes of water that could be relied upon during various dry-year conditions. The results of this study, shown in **Table 2-2**, indicate that the volume of water available for delivery during a 2-year drought would decline to about 54 percent of average deliveries under 2007 conditions, and to about 40 percent of average deliveries under 2027 conditions (DWR, 2008).

TABLE 2-2
STATE WATER PROJECT
AVERAGE AND DRY-YEAR DELIVERIES
(Percentage of Full Table A Amounts)

Year	Average (1922–1994)	Single Dry Year (1977)	2-Year Drought (1976–1977)	Percentage of Average
2007	63	6	34	54
2027	66 - 69	7	26 - 27	40

SOURCE: DWR, 2008.

2.3.3 Coordinated Operations of the Central Valley Project and State Water Project

The federal government and the State of California entered into the Coordinated Operations Agreement in 1986. This agreement established a set of procedures for coordinated operations of the CVP and SWP, including formulas for sharing responsibility in meeting Delta water quality standards, sharing unstored flows, and exchanging water and services between the CVP and SWP. Because both the CVP and SWP use the Sacramento River and Delta as common conveyance facilities, upstream reservoir releases and diversions from the Delta must be coordinated to ensure each entity's use of available water supplies and to meet obligations to protect other beneficial

SOURCE: ESA, 2008

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Figure 2-4

Major Components of the State Water Project

uses (Reclamation, 2004). Compliance with Delta water quality standards and federal and state Endangered Species Acts (ESAs) drives much of the coordinated operations.

Delta Water Quality Standards. The 1995 *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary*, prepared by the SWRCB, defines Delta water quality standards that must be met by the CVP and SWP. The SWRCB issued Decision 1641, which amended certain terms and conditions to the CVP and SWP water rights, including the water quality objectives adopted in the water quality control plan. The standards expressed in the plan and enforced through Decision 1641 are for the protection of fish and wildlife, M&I water quality, agricultural water quality, and Suisun Marsh salinity. The SWRCB adopted an amended Water Quality Control Plan for the Bay-Delta in December 2006 that addresses new issues such as Pelagic Organism Decline (SWRCB, 2006).

ESA Compliance. For purposes of consultation with USFWS and NMFS under Section 7 of the federal ESA for operation of the CVP, Reclamation prepared and periodically updates a CVP Operations Criteria and Plan (OCAP) that describes the facilities and operating environment of both the CVP and SWP. This plan identifies the factors influencing the physical, regulatory, and institutional conditions in which the coordinated projects operate. The plan identifies and evaluates typical operating strategies under various hydrologic conditions.

In 2004, Reclamation released an updated OCAP addressing the coordinated operations of the CVP and SWP. The corresponding biological opinions, issued by NMFS and USFWS, were found by a federal court to be deficient. The court issued an Interim Order setting flow requirements to be used until new biological opinions were issued. Reclamation reissued OCAP in 2008 and subsequently reinitiated Section 7 consultation in accordance with the federal ESA. A new OCAP biological opinion for delta smelt was issued by USFWS in December 2008, and a new OCAP biological opinion for salmon and steelhead is expected to be issued by NMFS in mid-summer 2009.

The analyses pertaining to operations of the SWP and CVP in this document are based on the Interim Order issued by the federal court and the 2004 OCAP. Because NMFS has not yet issued its biological opinion, it is not yet possible to assess the changes to SWP and CVP operations that may occur due to the combined effects of the USFWS and NMFS biological opinions for 2008 OCAP. Reclamation and DWR intend to complete an analysis of the effects that the new biological opinions will have on the operations of SWP and CVP. It is possible that the new opinions may result in moderate to severe fishery restrictions being imposed on Delta exports, depending on annual hydrologic conditions, above and beyond those caused by the Interim Order. The analysis of the effects of the new biological opinions on the operations of the SWP and CVP will be described in the Final Federal Feasibility Report and the Final EIS/EIR for this project.

For purposes of complying with the state and federal ESAs, DWR and Reclamation have initiated the Bay Delta Conservation Plan (BDCP), which is further described in Section 2.4.

2.3.4 In-Delta Water Uses

Water use in the Delta region averages about 1.7 MAF per year, with the majority used for agriculture. Most of the agricultural water is directly diverted by farmers through unscreened diversions under riparian or pre-1914 water rights. There are about 1,800 irrigation diversions in the Delta. Drainage water from farming operations is pumped back to the Delta waterways. A small amount of water also goes to urban uses, including diversions by CCWD, the City of Antioch, and industries along the Pittsburg-Antioch shoreline. The CVP and SWP are operated to meet water quality standards that are in place to protect water quality for in-Delta users (DWR, 2005).

2.4 Water Use Efficiency, Water Conservation, and Water Recycling

2.4.1 CCWD Service Area

CCWD recognizes the need for continuing efforts to improve water use efficiency and has a successful track record of reducing water use despite an increasing population. CCWD signed and adheres to the Urban Water Conservation Memorandum of Understanding (renewed in 1997), and has implemented conservation Best Management Practices since 1991.

From 1987 through 1990, the amount of water used within CCWD's service area derived from Delta supplies was about 140,000 acre-feet per year. Water use efficiency efforts, including residential, commercial, industrial, and institutional conservation, and recycled water use in CCWD's service area have reduced water use derived from Delta supplies to 118,000 acre-feet per year (2004 through 2007), despite a population increase of about 40 percent since 1986. Recycled water use in CCWD's service area is about 8,500 acre-feet per year and is expected to climb to about 13,000 acre-feet per year by 2010. CCWD's conservation savings are planned to more than double by 2020 (CCWD, 2005). CCWD has supported efforts to set a goal of reducing urban per capita water use by 20 percent by 2020.

2.4.2 Bay Area Region

The Bay Area as a whole has also reduced water use despite an increasing population. From 1986 to 2005, Bay Area population increased by about 21 percent, while M&I water use only increased by about 3 percent. Recycled water use within the region was about 56,000 acre-feet per year in 2005, with plans to double that by 2020 (BAWAC, 2005).

Agencies on the South Bay Aqueduct (Alameda County Flood Control and Water Conservation District, Zone 7 (Zone 7), Alameda County Water District, and SCVWD) have signed and adhere to the Urban Water Conservation Memorandum of Understanding and have implemented conservation Best Management Practices. All three agencies have aggressive water use efficiency programs and plans to increase water conservation and recycling efforts into the future.

2.5 Other On-going Planning Processes

2.5.1 Delta Vision

Delta Vision is a planning process initiated by the Governor of the State of California through Executive Order S-17-06 that established an independent Blue Ribbon Task Force responsible for development of a durable vision for sustainable management of the Delta. A cabinet-level Delta Vision Committee was appointed to oversee the process. The Delta Vision Committee appointed a 43-member Stakeholder Coordination Group and two science advisors to provide input to the Task Force and Committee.

The work of the Task Force included two phases: the Vision, which was completed in December 2007, and the Strategic Plan, which was completed by the Task Force and sent to the Committee in November 2008 (Delta Vision Blue Ribbon Task Force, 2007 and 2008). The Committee prepared its report to the Governor, which was released to the public on January 2, 2009 (Delta Vision Committee, 2008). Key recommendations include significant increases in conservation and water system efficiency and new water conveyance and storage facilities. The report also recommends actions that include improving flood protection, implementing high priority ecosystem restoration projects, and pursuing conveyance and storage system improvements as rapidly as possible. The Los Vaqueros Reservoir Expansion Project, like all the CALFED Program storage projects, is consistent with the Delta Vision recommendations, but independent of the planning effort. Decisions on whether and how to proceed with any of the alternatives evaluated in this EIS/EIR are not tied to implementation of the Delta Vision.

2.5.2 Bay Delta Conservation Plan

The BDCP is a conservation plan being prepared to meet the requirements of section 10 of the federal ESA, and either section 2835 or section 2081 of the State Fish and Game Code. DWR and state and federal water contractors intend to apply for Incidental Take Permits for water operations and management activities in the Delta. The BDCP will also be used, if feasible, by Reclamation as the basis for federal ESA section 7 compliance, resulting in the issuance of biological opinions and Incidental Take Permits to Reclamation for their participation and implementation of the BDCP. These incidental take authorizations will allow for the incidental take of threatened and endangered species resulting from covered activities and conservation measures associated with water operations of the SWP and CVP, including facility improvements and maintenance activities, operational activities related to water transfers, new Delta conveyance facilities, and habitat conservation measures included in the BDCP.

Entities seeking incidental take coverage through the BDCP include Reclamation, DWR, Metropolitan Water District of Southern California, Kern County Water Agency, SCVWD, Zone 7, San Luis Delta Mendota Water Authority, Westlands Water District and Mirant Delta. The BDCP will likely include capital improvements for water supply conveyance, ecological restoration, monitoring, and adaptive management.

The BDCP is in the early stages of planning. A Notice of Preparation of a joint EIR/EIS was issued by DWR on March 17, 2008. A Notice of Intent to prepare an EIR/EIS and conduct scoping meetings was issued by Reclamation, USFWS, and NMFS on April 15, 2008.

The reservoir expansion project is not a covered activity in the BDCP; decisions on whether and how to proceed with any of the project alternatives evaluated in this EIS/EIR are not tied to completion or implementation of the BDCP.

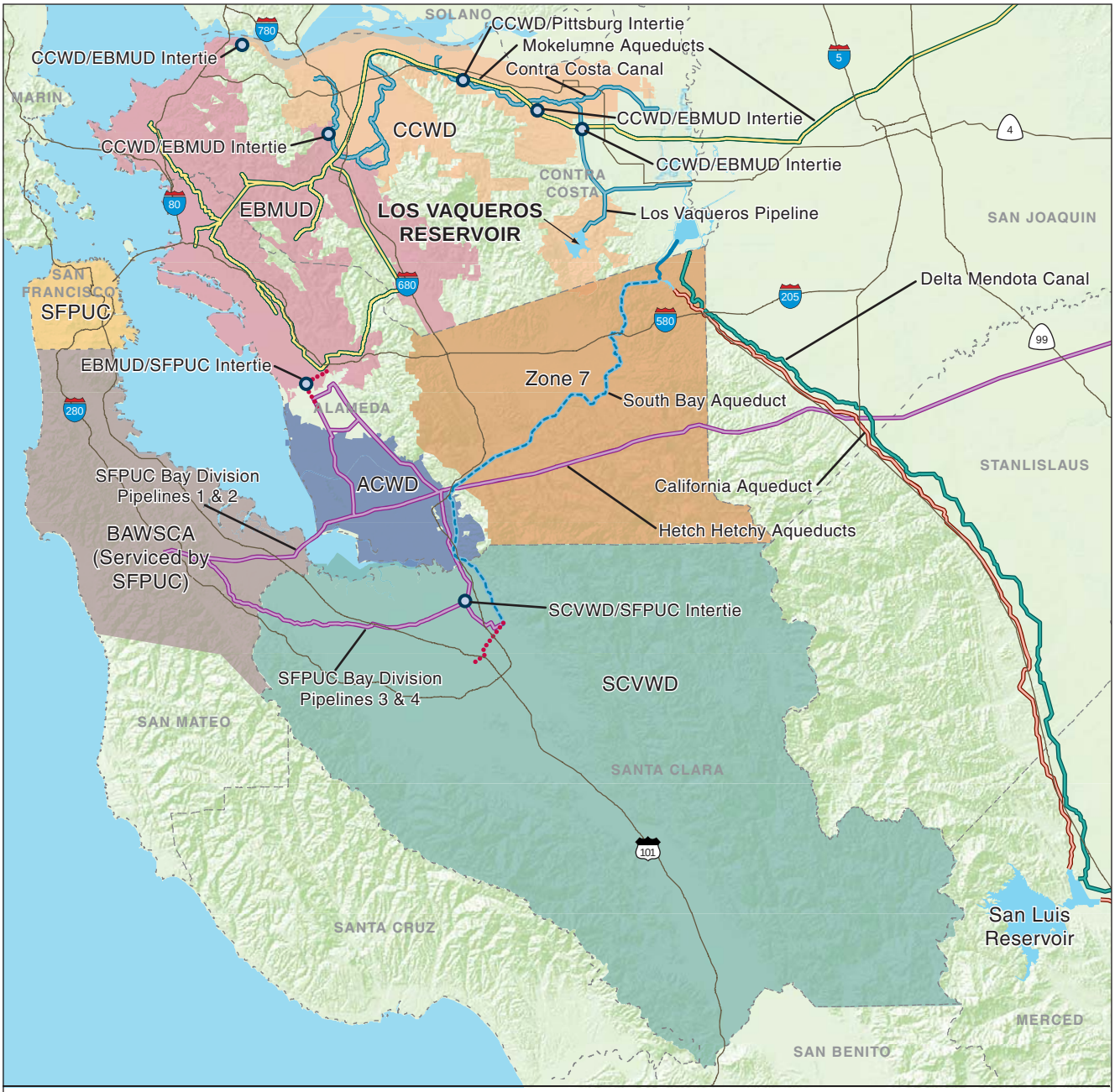
2.5.3 OCAP Biological Opinions

USFWS and NMFS issued biological opinions for the OCAP in 2005 and 2004, respectively. These biological opinions covered the effect of the joint operations of the SWP and CVP on federally listed threatened and endangered species and their critical habitat. USFWS issued a new OCAP biological opinion in December 2008, as required by federal court order in *Natural Resources Defense Council v Kempthorne* (2007). NMFS is currently preparing a new OCAP biological opinion as required by federal court order in *Pacific Coast Federation of Fishermen's Associations v Gutierrez* (2008). This biological opinion is expected in mid-summer 2009. The new OCAP biological opinions will cover current operations of the SWP and CVP. See section 2.3.3 above for additional information on OCAP and ESA compliance.

2.5.4 Integrated Regional Water Management

Numerous regional and local water supply planning efforts are ongoing within the Bay-Delta Area. CCWD participates in two Integrated Regional Water Management Plans (IRWMPs): the Bay Area IRWMP and the East Contra Costa County IRWMP. Both of these IRWMPs emphasize collaboration among water management agencies to provide multiple benefits, and cost-effective and sustainable solutions to water supply and water quality challenges.

The reservoir expansion project is not included in either of these IRWMPs because at the time those plans were being prepared the reservoir expansion project was being studied in coordination with the overall CALFED Storage Program. However, numerous projects to improve water supply reliability and water quality are included in the plans, such as conservation, recycled water, regional interties, desalination and groundwater development, treatment, and banking. **Figure 2-5** shows the major regional water supply infrastructure serving the Bay Area agencies along with specific locations of system interties among agencies. Decisions on whether and how to proceed with any of the project alternatives presented in this EIS/EIR are not tied to the outcome of any IRWMPs.



SOURCE: USGS, 1993 (base map); and ESA, 2008

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Figure 2-5

Bay Area Water Agencies – Regional System Facilities and Interties