

CHAPTER II

RELATED STUDIES, PROJECTS, AND PROGRAMS

This chapter summarizes the related activities of various Federal, State, and local agencies and other working groups within the study area. Many of these entities, including the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), are performing current studies, projects, and programs that are directly or indirectly relevant to the Los Vaqueros Expansion Investigation (LVE).

BUREAU OF RECLAMATION

As the owner and operator of the State's largest water project, the Central Valley Project (CVP), Reclamation has a significant effect on water and environmental resources in the study area. This section discusses the CVP, Central Valley Project Improvement Act (CVPIA), and Operations Criteria and Plan (OCAP).

Central Valley Project

Development and construction of the CVP was authorized under Federal Reclamation Law beginning in 1902. The CVP is the largest surface water storage and delivery system in California, with a geographic area covering 35 of California's 58 counties. The project includes 20 reservoirs with a combined storage capacity of approximately 11 million acre-feet (MAF); 8 powerplants and 2 pump-generating plants with a combined generation capacity of approximately 2 million kilowatts (kW); and approximately 500 miles of major canals and aqueducts. The CVP supplies water to more than 250 long-term water contractors in the Central Valley, Santa Clara Valley, and San Francisco Bay Area (Bay Area). **Plate 2** shows the locations of major CVP facilities, rivers that are controlled or affected by the operation of CVP facilities; and other major water facilities in the state.

The CVP has the potential to deliver about 7 MAF annually to agricultural and municipal and industrial (M&I) customers and for environmental purposes. Of this 7 MAF, about 6.2 MAF would be for agricultural uses, 0.5 MAF for urban uses, and 0.3 MAF for wildlife refuges. However, while an annual delivery capability of 7 MAF exists, actual deliveries are currently much lower. For example, approximately 4.1 MAF were delivered for agricultural and M&I users in 2004, combined. Historically, about 90 percent of CVP water has been delivered to agricultural users, including prior water rights holders. Municipal customers include the cities of Redding, Folsom, Tracy, and Fresno; various agencies in the Sacramento metropolitan area; most of Santa Clara County; the East Bay Municipal Utility District (EBMUD) service area; the central and eastern portions of Contra Costa County; and others. The CVP also provides flood control, navigation, power, recreation, and water quality benefits.

Several regulatory requirements and agreements affect operation of the CVP. Prior to passage of the CVPIA, (described below), operation of the CVP was affected by State Water Resources Control Board (SWRCB) Decisions 1422 and 1485 (D-1422 and D-1485), and the Coordinated Operations Agreement (COA). D-1422 and D-1485 identify minimum flow and water quality

conditions at specified locations that are to be maintained in part through operation of the CVP. COA specifies the responsibilities shared by the CVP and the California SWP for meeting the requirements of D-1485. In December 1994, representatives of the Federal and State governments and urban, agricultural, and environmental interests agreed to implementing a Bay-Delta protection plan through the SWRCB that would protect the ecosystem of the Bay-Delta estuary. D-1641 superseded D-1485 in 1999 and was later amended in 2000 (see discussion under California State Water Resources Control Board in this chapter). Coordinated operations of the CVP and SWP continue to be based on COA.

Operation Divisions

CVP operations are grouped into 10 divisions. Operations north of the Sacramento-San Joaquin Delta (Delta) include the Trinity, Shasta, American River, and Sacramento River divisions, known collectively as the Northern CVP System. Those south of the Delta, and the Delta, West San Joaquin, and San Felipe divisions are known collectively as the Southern CVP System. Both the East Side and Friant divisions are operated independently of the remainder of the CVP due to the nature of their water supplies and service areas. The Northern and Southern CVP systems are operated as an integrated system, and demands for water and power can be met by releases from any one of several facilities. Demands in the Delta and south of the Delta can be met by the export of excess water in the Delta, which can result from releases from Northern CVP reservoirs. Operational decisions are based on a number of physical and hydrological factors that change depending on conditions.

CVP Water Users

During development of the CVP, the United States entered into long-term contracts in the Central Valley with many major water rights holders, who belong to three major groups: (1) Sacramento River Settlement Contractors, (2) San Joaquin River Exchange Contractors, and (3) Water Service Contractors.

Members of Sacramento River Settlement Contractors primarily claim water rights on the Sacramento River. Because of the significant influence on flows in the Sacramento River, these water rights claimants entered into contracts with Reclamation. Most of the agreements established the quantity of water the contractors are allowed to divert from April through October without payment to Reclamation, and also established a supplemental CVP supply allocated by Reclamation.

San Joaquin River Exchange Contractors are contractors who receive CVP water from the Delta via the Mendota Pool. Under exchange contracts, the parties agreed not to exercise their San Joaquin River water rights in exchange for a substitute CVP water supply from the Delta. These exchanges allowed for water to be diverted from the San Joaquin River for use by water service contractors in the San Joaquin Valley and Tulare Lake Basin.

Before construction of the CVP, many irrigators on the west side of the Sacramento Valley, on the east and west sides of the San Joaquin Valley, and in the Santa Clara Valley relied primarily on groundwater. With completion of CVP facilities in these areas, irrigators signed agreements with Reclamation for delivery of CVP water as a supplemental supply. Several cities also have

similar contracts for M&I supplies; these irrigators and cities are known as CVP Water Service Contractors. CVP water service contracts are between the United States and individual water users or districts and provide for an allocated supply of CVP water to be applied for beneficial uses.

Central Valley Project Improvement Act

The CVPIA was signed into law in October 1992 to address conflicts over water rates, irrigation land limitations, and environmental impacts of the CVP. This legislation mandates changes in management of the CVP, particularly for protection, restoration, and enhancement of fish and wildlife. The CVPIA also addresses the operational flexibility of the CVP and methods to expand the use of voluntary water transfers and improved water conservation. General purposes of the CVPIA, as identified by Congress in Section 3402, include the following:

- Protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California.
- Address impacts of the CVP on fish, wildlife, and associated habitats.
- Improve operational flexibility of the CVP.
- Increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation.
- Contribute to the State of California's interim and long-term efforts to protect the Bay-Delta Estuary.
- Achieve a reasonable balance among competing demands for CVP water, including water requirements for fish and wildlife, agriculture, M&I, and power contractors.

The CVPIA redefined the purposes of the CVP to include protection, restoration, and enhancement of fish, wildlife, and associated habitats and protection of the Bay-Delta Estuary as having equal priority with other purposes. The CVPIA identified numerous specific measures and programs to meet the new project purpose and also directed the Secretary of the Interior to operate the CVP consistent with these purposes. Sections of the CVPIA important to this study include those focused on dedicating a portion of CVP yield to be used for environmental purposes; the Anadromous Fish Restoration Program (AFRP), which included a goal of doubling natural production of anadromous fish in Central Valley rivers and streams; the Restoration Fund; urban water reliability; water transfers; refuge water supplies; restoration of the San Joaquin, Trinity, and Stanislaus rivers; and a stakeholder process.

Central Valley Project Improvement Act Environmental Water Acquisition

The combined total amount of water dedicated to the environment by the CVPIA suggests an annual amount of up to 1.2 MAF. This includes reallocation of the 800 thousand acre-feet (TAF) designated in Section 3406 (b)(2) of the CVPIA (commonly called (b)(2) water), dedicated inflows to wildlife refuges of 250,000 acre-feet, and Trinity Reapportion water amounting to 150,000 acre-feet. However, after accounting for system operation flexibility, the total impact of

the CVPIA for CVP contractors is estimated to be a reduction of 585,000 acre-feet annually. It is estimated in the CVPIA Programmatic Environmental Impact Report (EIR) that reduced water supplies and other CVPIA provisions would result in increased groundwater overdraft, fallowing of agricultural land, loss of jobs, and loss of over \$150 million in annual agricultural revenues. Most of this loss would be the result of the reduction in water supplies.

Implementation of the CVPIA (b)(2) provision has been a contentious process, marked by conflict between Federal and State parties, and substantial litigation. The primary dispute has been whether (b)(2) water translates into an automatic reduction in exports under water supply contracts. In May 2003, Reclamation released a final decision on implementation of §3406 (b)(2). The decision incorporates parts of an earlier decision (United States Department of the Interior 1999 Final Decision), modifies other decisions, and adds new components. The intent of these changes was to simplify and clarify the accounting process for (b)(2) water uses and to integrate (b)(2) water dedication and management with CVP operations for other CVP purposes. The decision is divided into sections that address calculations of yield; accounting processes; modifications of CVP operations; water banking and transfers/exchanges of water; water to meet the 1995 Bay-Delta Water Quality Control Plan and 1978 Federal ESA obligations; shortage criteria; and coordination.

The total of 800 TAF of water dedicated under CVPIA (b)(2) is used by the U.S. Fish and Wildlife Service (USFWS), in coordination with Reclamation and other agencies, to meet water quality obligations, flow requirements, and other regulations. In the Delta, CVPIA (b)(2) water is used to reduce exports at the CVP Tracy Pumping Plant to in turn reduce entrainment of salmon or delta smelt. The May 2003 Decision on Implementation set aside 200 TAF of the total (b)(2) supply for upstream fish protection actions, reducing the amount of water available in the Delta for water quality control and CVP export curtailments.¹

The Water Acquisition Program, a joint effort by Reclamation and USFWS, was created to meet water acquisition needs under the CVPIA. The program targets up to 163,000 acre-feet annually to meet optimal waterfowl habitat management needs at various Federal and State wildlife areas in the Central Valley, and to support instream flows. The optimum refuge water supply levels are referred to as Level 4 requirements, as shown in **Table II-1**. Incremental Level 4 is defined as the difference between historic annual average water deliveries (Level 2) and optimum waterfowl habitat management supplies (Level 4). Incremental Level 4 acquisitions to date have been less than the targeted volume primarily because some refuges have been unable to receive full Level 4 supplies due to delivery/conveyance limitations and program funding shortfalls. Acquisitions have been limited in recent years by financial constraints and the increasing cost of water; approximately \$5 million is dedicated annually from the CVP Restoration Fund for Level 4 water acquisitions.

¹ It is noted for clarification that actions taken under the CVPIA using water supplies identified for Section 3406 (b)(2) fish actions represent water supply reductions for project users, not water supply replacement actions, such as under the EWA Program.

TABLE II-1
CVPIA WATER ACQUISITION PROGRAM PURCHASES
FOR LEVEL 4 AND OTHER PURPOSES, 1994-2003

Water Year	Annual Level 4 Acquisitions (acre-feet)	Other Water Acquisitions (acre-feet)	Total Water Acquired (acre-feet)	Price Range (per acre-foot)
2004	67,710	98,211	165,921	\$60 - \$130
2003	70,000	91,526	151,526	\$60 - \$130
2002	85,390	68,105	153,495	\$30 - \$120
2001	63,005	109,785	172,790	\$60 - \$150
2000	67,748	108,880	176,628	\$60 - \$125
1999	43,618	224,498	268,116	\$25 - \$65
1998	6,300	80,000	86,300	\$15 - \$70
1997	69,800	155,983	225,783	\$15 - \$70
1996	36,395	16,161	52,556	\$25 - \$50
1995	88,009	0	88,009	\$25 - \$36
1994	29,415	76,441	105,856	\$24 - \$50
Total	559,680	918,879	1,478,559	\$15 - \$150

Source: Water Acquisition Program Frequently Asked Questions, November 2003, summary of acquisitions from 1994 through November 2003.

The Water Acquisition Program also acquires water to boost instream flows for the AFRP. Water purchased for instream flows has primarily been used in the San Joaquin Valley to support programs such as the San Joaquin River Agreement/Vernalis Adaptive Management Program (VAMP), a fishery management program on the lower San Joaquin River.

CVP Water Supply Replacement Plan

Section 3408 (j) of the CVPIA directed the Secretary of the Interior to prepare a least-cost plan to increase the yield of the CVP by an amount equal to that dedicated to fish and wildlife under the CVPIA. This plan was also intended to assist the State in meeting its future water needs. Further, appropriate cost-sharing arrangements to implement the CVP Water Supply Improvement Plan were to be recommended. The 1995 Least-Cost CVP Yield Increase Plan, as well as the draft report, *Replacing the Delivery Impact of CVPIA: A Supplement of the Least-Cost CVP Yield Increase Plan*, identified cost and supply estimates for a number of new water supply and management options, including groundwater storage, land fallowing, conservation and reuse, and surface storage. The plan did not, however, propose a specific CVP yield increase. Reclamation is currently preparing a supplement to the 1995 plan.

CVP Water Management Program

Section 3405 (e) of the CVPIA directed the Secretary of the Interior to develop best management practices (BMP) for water conservation and efficient water use, and to identify criteria for evaluating water management plans developed by CVP contractors. Reclamation provides educational, technical, and financial assistance, through cost-sharing, to CVP contractors preparing agricultural and/or urban water management plans, including those plans to meet the

water conservation requirements of the Reclamation Reform Act of 1982. Technical assistance is also provided through State and local partnerships and agreements with the Irrigation and Training Research Center at Cal Poly, San Luis Obispo, and the California Urban Water Conservation. Grant funding for implementation of BMPs is available to CVP contractors through Reclamation's Water Conservation Field Service Program.

CVPIA Contract Renewal Process

In accordance with Section 3404(c) of the CVPIA, Reclamation is currently negotiating long-term water service contracts. It is anticipated that over 100 CVP water service contracts, with users located within the Central Valley, may be renewed during this negotiation process. As of June 2005, about 60 percent of the contracts were executed. As part of this process, Reclamation is also negotiating renewal of 55 interim water service contracts.

Operations Criteria and Plan

In March 2004, Reclamation and DWR prepared a Long-Term CVP and OCAP to address how the CVP and SWP would be operated in the future as several proposed projects come on-line and as water demands increase. This document is a revision of the previous 1992 OCAP release and incorporates numerous additional constraints and criteria that have arisen since 1992. Several incorporations include the 2000 Trinity ROD, AFRP flow objectives, the 1993 Winter Run Biological Opinion (BO), the revised decision on CVPIA §3406(b)(2) water, EWA, and Joint Point of Diversion (JPOD).

CALIFORNIA DEPARTMENT OF WATER RESOURCES

As the owner and operator of the State's second largest water project, DWR has a significant effect on water and environmental resources in the study area. This section discusses the SWP, California Water Plan, South Bay Aqueduct Improvement and Enlargement, and Franks Tract Project.

State Water Project

The SWP was authorized in 1959 and designated to readjust geographical imbalances between California's water resources and water needs. The project extends from Plumas County in the north to Riverside County in the south. The SWP delivers water to service areas in the Feather River basin, Bay Area, San Joaquin Valley, Tulare basin, and Southern California.

Completed project elements include 23 dams and reservoirs, 6 power plants, 17 pumping plants, and 533 miles of aqueduct, as shown in **Plate 2**. The principal storage feature of the SWP is Lake Oroville, with a gross pool capacity of 3.5 MAF. Lake Oroville is located on the Feather River about 4 miles northeast of Oroville. Water released from Oroville Dam flows through the Feather and Sacramento rivers to reach the Delta.

Major SWP conveyance facilities in the Central Valley include the North Bay, South Bay, and California aqueducts. The North Bay Aqueduct diverts water from Barker Slough in the north Delta for agricultural and M&I uses in Napa and Solano counties. The South Bay and California aqueducts carry water from the Delta to the Bay Area and to Southern California, respectively.

In the southern portion of the Delta, the Harvey O. Banks Delta Pumping Plant lifts water into the California Aqueduct from the Clifton Court Forebay. At 444 miles, the California Aqueduct is the State's largest and longest water conveyance system, beginning at Banks Pumping Plant and extending to Lake Perris, south of Riverside in Southern California. **Plate 2** includes a layout of major SWP facilities.

The contracts between DWR and the 29 SWP water contractors define the terms and conditions governing water delivery. Table A is an exhibit in the water supply contracts and is the maximum supply of scheduled water that a contractor may request. The total of the 29 contractors' maximum Table A amount for deliveries is about 4.13 MAF per year. Of this amount, about 2.6 MAF is designated for the Southern California, nearly 1.2 MAF for the San Joaquin Valley, and the remaining 373,000 acre-feet for the San Francisco Bay, central coast, and Feather River areas (as of December 31, 2002).

SWP contracts involve the Feather River Settlement Contractors and SWP Contract Table A Allocations. The Feather River Settlement Contractors are water users who hold riparian and senior appropriative rights on the Feather River. SWP Contract Table A Allocations are contracts executed in the early 1960s that established the maximum annual water amount that each long-term contractor may request from the SWP.

California Water Plan

The State, through DWR, prepares and publishes the California Water Plan through its Bulletin 160 series. Seven versions of the plan were published between 1966 and 1998. A 1991 amendment to the California Water Code directed DWR to update the plan every 5 years. The Bulletin 160 series assesses California's agricultural, environmental, and urban water needs and evaluates water supplies to quantify future water demands and supplies. A focus of the 1998 Bulletin 160 is water management actions that could be implemented to improve California's water supply reliability. While the 1998 Bulletin 160 shows that under existing conditions the north coast and San Francisco Bay areas will not face shortages under average year hydrologic conditions, it characterizes the rest of the State as facing average year shortfalls of between 10,000 acre-feet and 900,000 acre-feet. Under drought year conditions, the entire State is portrayed to face water shortages. While the 1998 Bulletin 160 identifies some potential additional supply measures, little progress has been made in planning and developing these supplies.

DWR, through a highly collaborative process, is currently completing the latest update, Bulletin 160-05. California Water Plan Update 2005 addresses the State's changing water management and better reflects the roles of the State and Federal governments, and the growing role of regional and local agencies, in California water management. The update goes beyond a forecast of statewide water demand and supply. It will include a strategic plan with goals, recommendations, and actions for meeting the challenges of sustainable water use through 2030.

Two key initiatives outline the ways the foundational actions in the Water Plan Update will be achieved. The first is to implement integrated regional water management, which is a comprehensive, systems approach for determining the appropriate mix of demand and supply management options that provide long-term, reliability water supply at lowest reasonable cost

and with highest possible benefits to customers, economic development, environmental quality, and other social objectives. The second initiative is to improve statewide water management systems, on which California depends to provide clean and reliable water supplies, protect lives and property from flooding, withstand drought, and sustain environmental values.

South Bay Aqueduct Improvement and Enlargement

DWR is implementing improvements to and expansion of the existing South Bay Aqueduct (SBA) facilities. The proposed project would make improvements to bring the existing capacity of the water conveyance system up to its design capacity of 300 cubic feet per second (cfs), construct a balancing reservoir, and add 130 cfs to provide a total of 430 cfs conveyance capacity. The final EIR was certified and the project was approved in December 2004. Improvement and enlargement of the SBA system involves modifying and constructing a number of facilities, including the following:

- Installing additional pumps at the South Bay pumping plant, constructing new switchyards, and possibly relocating ½-mile of a 230-kilovolt transmission line.
- Constructing a third Brushy Creek pipeline and surge tank parallel to the existing dual pipelines, and constructing a 500-acre-foot reservoir served by the third pipeline.
- Raising the height of canal embankments, lining, and overcrossing structures for the Dyer, Livermore, and Alameda canals, including modification to Patterson Pass Reservoir.
- Modifying check structures and siphons along the Livermore and Alameda canals.

Proposed modifications and improvements to the SBA system all would occur north of Del Valle Reservoir.

Franks Tract Project

In January 2004, the DWR Levees and North Delta Branch began a feasibility study to evaluate the potential to create ecosystem, water quality, recreational, and other benefits at Franks Tract by modifying remnant levees and constructing tidal gates to inhibit salt trapping and restore tidal marsh habitat. Franks Tract is located in the central Delta, southeast of Brannan-Andrus Island between False River and Bethel Island. Franks Tract flooded in 1936 and again in 1938. The levees were not repaired, and the flooded island was later made a State Recreation Area. The proposed Franks Tract Project may improve the quality of water diverted at CVP and SWP South Delta pumping facilities and for in-Delta water users. Changing hydrodynamic conditions at the flooded island may improve the migration of fish through the Delta, restore the ecosystem by improving the basic food supply essential to the aquatic environment, and enhance recreational opportunities at Franks Tract by providing additional levee beach slopes.

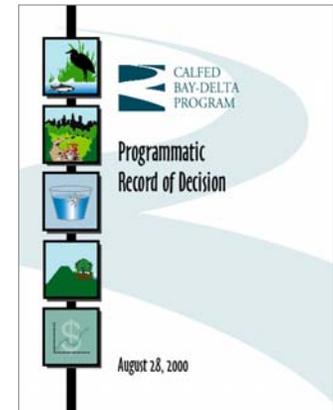
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

The California SWRCB sets flow and water quality objectives in the Delta to protect beneficial uses of the Delta. SWRCB 1999 D-1641 sets specific Delta outflow requirements throughout the year, specific export restraints in the spring, and export limits based on a percentage of estuary inflow throughout the year. D-1641 also obligates the CVP and SWP to comply with the 1995

Water Quality Control Plan for the San Francisco Bay / Sacramento San Joaquin Delta Estuary (Bay-Delta Plan), which sets water quality objectives in the Delta. Included in D-1641 is VAMP, a 12-year program that uses pulse flows on the San Joaquin River, and south Delta CVP/SWP pumping curtailments, to improve habitat conditions in the Delta. CVPIA (b)(2) water can be used to account for VAMP pumping curtailments. VAMP flow modification actions are directed at fall-run Chinook salmon and delta smelt, and typically occur between April and May.

CALFED BAY-DELTA PROGRAM

CALFED is a cooperative effort among Federal and State agencies and California's environmental, urban, and agricultural communities. The Governor of California and the President of the United States initiated work on the program in 1995 to address environmental and water management problems associated with the Bay-Delta system. CALFED has taken a broad approach to addressing four problem areas: (1) water quality, (2) ecosystem quality, (3) water supply reliability, and (4) levee system integrity. Many of the problems and solutions in the Bay-Delta system are interrelated. Program implementation began following circulation of the final programmatic Environmental Impact Statement (EIS)/EIR and signing of the ROD in August 2000. A total of 18 Federal and State agencies participated in developing the EIS/EIR, with 13 signatories to the ROD (some agencies under a single overseeing body). The signatories noted that they would exercise their respective authorities over only those portions relevant to their authority. The CALFED ROD describes a series of programmatic elements that set the long-term direction of the CALFED program to meet its Mission Statement² and objectives.³ Individual programs and solutions are intended to adhere to the CALFED Solution Principles identified in the ROD, which include the following:



- Reduce conflicts in the system
- Be equitable
- Be affordable
- Be durable

² **CALFED Mission Statement** - The mission of the CALFED Bay-Delta Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.

³ **CALFED Objectives** - CALFED developed the following objectives:

- Provide good water quality for all beneficial uses.
- Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species.
- Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system.
- Reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

- Be implementable
- Have no significant redirected impacts

In 2003, the State of California formed the California Bay-Delta Authority to help oversee the numerous Federal and State agencies working cooperatively to implement the CALFED Program. The California Bay-Delta Act established the authority as the new governance structure and charged it with providing accountability, ensuring balanced implementation, tracking and assessing CALFED progress, using sound science, assuring public involvement and outreach, and coordinating and integrating related government programs. In October 2004, the Water Supply, Reliability, and Environmental Improvement Act authorized Federal participation in implementing the CALFED Program.

Ultimately, implementing the CALFED programs depends on authorization and funding from participating Federal and State agencies. CALFED is expected to take 25 to 30 years to complete. CALFED program elements are summarized below.

Ecosystem Restoration Program

The Ecosystem Restoration Program (ERP) element consists of improving the ecological health of the Bay-Delta watershed through restoring and protecting habitats, ecosystem functions, and native species. This program offers funding, coordination, and technical assistance to support local watershed activities. Primary program elements include (1) an annual grant program to fund local projects for habitat restoration, fish passage, invasive species management, and environmental water quality, (2) habitat restoration in the Delta and its tributary watersheds, (3) stream flow augmentation in upstream areas through voluntary water purchases, (4) fish passage improvements through modification or removal of dams, improvement of bypasses and ladders, (5) integration of flood management and ecosystem restoration, (6) support for efforts to manage watersheds that affect the Bay-Delta system, development of watershed assessments and plans, and implementation of specific watershed conservation, maintenance, and restoration actions, and (7) management of the EWA.

Watershed Program

The goal of the Watershed Program element is to promote locally led watershed management activities and protections that contribute to achieving CALFED goals for ecosystem restoration, water quality improvement, and water supply reliability. The program provides financial and technical assistance to local community watershed programs to further these goals.

Water Supply Reliability Program (Water Management)

One of the primary goals of CALFED is to improve the reliability of California's water supply within the context of unpredictable hydrology and often-conflicting needs of water users and the environment. This program is intended to work with other CALFED program elements, such as the Storage Program and EWA, to address the various factors that influence water supply reliability, including water system flexibility, water use efficiency, regulatory actions, interagency cooperation, and storage and conveyance infrastructure.

Storage Program

The Storage Program element seeks to develop additional storage capacity to help meet the needs of California's growing population and to provide increased system flexibility for helping to improve water quality and restore ecosystems. The first stage of the program consists of increasing by approximately 950,000 acre-feet the storage capacity at existing reservoirs and strategically located offstream sites, and implementing major expansion of groundwater storage for an additional 0.5 to 1.0 MAF.

CALFED work teams have prepared numerous documents on all aspects of the various program elements. An important document in the storage program element is the *Integrated Storage Investigation Report - Initial Surface Water Storage Screening* (August 2000), which assessed and screened numerous potential reservoir sites. Of the potential projects considered, 12 were retained for more detailed evaluation. Of these 12, Reclamation and DWR were tasked to work with other CALFED agencies to pursue implementation of 5 surface water storage projects. The 5 projects, described below and shown in **Figure II-1**, include Los Vaqueros Expansion, Enlarge Shasta, In-Delta Storage, North-of-the-Delta Offstream Storage (NODOS), and Upper San Joaquin River Basin Storage.

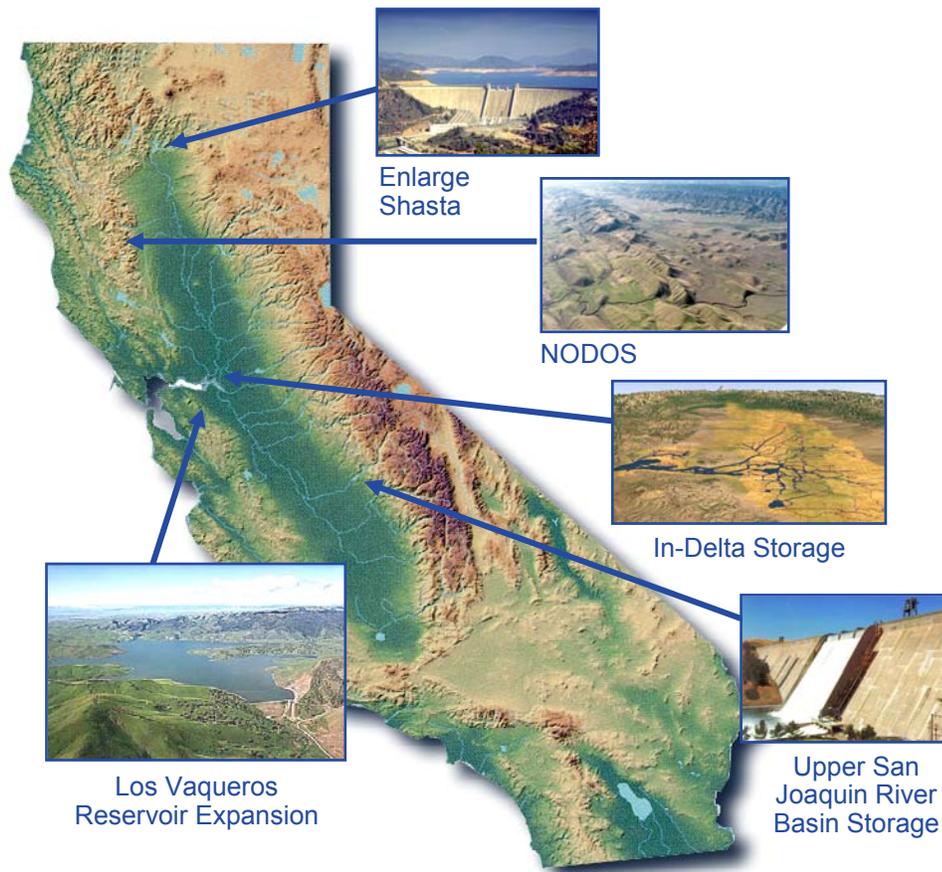


FIGURE II-1 – CALFED SURFACE WATER STORAGE PROJECTS RETAINED FOR FURTHER STUDY

- **Los Vaqueros Expansion** – The Los Vaqueros expansion project would consist of enlarging the 100,000-acre-foot existing reservoir by up to 400,000 acre-feet as part of a Bay Area water quality and water supply reliability initiative. The project could help improve the quality and reliability of Bay Area drinking water supplies while reducing the impacts of Delta water management operations on sensitive fisheries, and provide other benefits, such as recreation and environmental enhancement, to the extent possible. The ROD (p. 44) acknowledged that, as an existing reservoir operated by CCWD, the Los Vaqueros Reservoir expansion is subject to a number of mandates and agreements, and DWR and Reclamation should work with CCWD and respect their previous commitments. The CALFED ROD also recognized that expanding the reservoir could have potential habitat impacts on the California red-legged frog, San Joaquin kit fox, and other special-status species.
- **Enlarge Shasta** – The Enlarge Shasta project identified in the CALFED ROD Preferred Project Alternative consists of expanding Shasta Reservoir by approximately 300,000 acre-feet through raising Shasta Dam 6.5 feet. Potential benefits include increasing the pool of cold water available in Shasta Reservoir to maintain lower Sacramento River temperatures for at-risk fish, and to provide other water management benefits, such as water supply reliability for the CVP. Federal feasibility studies are currently underway for the Shasta Lake Water Resources Investigation.
- **North-of-the-Delta Offstream Storage** – This project is evaluating the feasibility of constructing a 1.8 MAF reservoir on the west side of the Sacramento River, about 60 miles northwest of Sacramento. As envisioned, the NODOS project would serve as an offstream storage reservoir filled primarily through pumped diversions from the Sacramento River and its tributaries during high flow periods. The lead agency for this study is DWR. Primary benefits from the new storage would be increased reliability for water supplies for a significant portion of the Sacramento Valley, enhanced operational flexibility for managing fisheries and water quality, and improved Sacramento River diversion management. Public scoping for NODOS has been completed and planning, environmental, engineering, and related work is underway. Authority for Federal feasibility-scope studies for the NODOS project was contained in Section 215 of PL 108-7.
- **Upper San Joaquin River Basin Storage** – The CALFED ROD included a potential storage project on the upper San Joaquin River. Reclamation, in coordination with DWR, is conducting an investigation that includes developing a comprehensive list of water supply alternatives that could add 250,000 to 700,000 acre-feet of new storage in the San Joaquin watershed, primarily through enlarging Millerton Lake at Friant Dam or developing a functionally equivalent project. This project would be designed to contribute to restoring habitat and improving water quality on the San Joaquin River, and facilitate conjunctive management of water exchanges that would improve the quality of water delivered to urban communities. Other potential benefits would include increased hydropower production and enhanced flood control operation. Authority for Federal feasibility-scope studies for the Upper San Joaquin River Basin Storage project also was contained in Section 215 of PL 108-7.
- **In-Delta Storage** – In-Delta Storage (sometimes referred to as Delta Wetlands) would convert two Delta islands comprising 11,000 acres (Webb Tract and Bacon Island) into surface water storage facilities, and two islands (Bouldin Island and Holland Tract) into

9,000 acres of managed habitat. The lead agency for this study is DWR. The two storage islands would provide approximately 220,000 acre-feet of new storage capacity. A State feasibility study conducted by DWR, with technical assistance from Reclamation, was released in early 2004. Hydrodynamic and economic modeling is underway. However, the project as proposed requires modifications and significant additional analyses. DWR and Reclamation are determining whether any redesign or reconfiguration of the project could make it feasible for public ownership.

The CALFED ROD identified the need to pursue these storage projects, not in isolation, but as part of an overall water management strategy that will contribute to or be compatible with ecosystem restoration and other objectives of the program. This overall strategy reflects the overarching principle that many of the problems being addressed by CALFED are interrelated, and individual projects should be developed as components of the overall CALFED solution. The CALFED ROD also states “costs should, to the extent possible, be borne by the beneficiaries of the program actions.” That principle is especially relevant in the decision to pursue new surface storage facilities, as the cost of these facilities can be considerable.

Conveyance Program

The Conveyance Program is aimed primarily at moving water through the Bay-Delta as efficiently as possible to increase system flexibility and improve Delta ecosystem health, water quality, and levee stability. This includes increasing export pumping capacity at SWP facilities in the south Delta to increase water supply reliability and fish protection. Several major projects include new fish screens at the Clifton Court Forebay and Tracy Pumping Plant; operable barriers to improve south Delta water levels and quality; the Tracy Fish Test Facility; Delta Cross Channel Reoperation; flood control and environmental enhancements in the north Delta and along the lower San Joaquin River; Clifton Court Forebay/Tracy Pumping Plant Intertie; and CVP/SWP Aqueduct Intertie. Two projects under the Conveyance Program of potential interest to the LVE are discussed below.

South Delta Improvements Program

Reclamation and DWR are the implementing agencies for the South Delta Improvements Program (SDIP), a part of the CALFED Conveyance Program. Goals of the SDIP include providing more reliable long-term export capability by the Federal and State water projects, protecting local diversions, and reducing impacts on San Joaquin River salmon. Potential actions as part of the SDIP include placing a fish barrier at the head of Old River; constructing up to three hydraulic barriers to improve circulation and stage in south Delta channels; dredging and extending agricultural diversions; and increasing the diversion capability of Clifton Court Forebay to 8,500 cfs. A site-specific Draft EIS/EIR is under preparation that will include a range of alternatives but will not have a specific proposed project alternative or preferred alternative. The final EIS/EIR will include identification of the preferred alternative and is scheduled for completion in early 2006.

San Luis Reservoir Low Point Improvement Project

The CALFED ROD identified a bypass canal to the San Felipe Division, operated in conjunction with local storage to avoid potential water quality impairment associated with low storage levels

in San Luis Reservoir. Funding for the study was appropriated by the State through Proposition 13 funds. Santa Clara Valley Water District (SCVWD) has completed environmental scoping. During the locally sponsored feasibility study, Reclamation participated as the National Environmental Policy Act (NEPA) lead, and has since initiated a draft Appraisal Report to assess potential Federal interest in pursuing feasibility-level studies of water quality and water supply reliability problems in the San Felipe Division of the CVP. Recent CALFED legislation provided Reclamation with feasibility study authority. During the feasibility study sponsored by SCVWD, and the appraisal study authorized by Reclamation, additional structural and non-structural measures were identified, in addition to a bypass canal, that could potentially address water quality and supply reliability concerns in the San Felipe Division.

Environmental Water Account

The CALFED ROD defined the EWA as a short-term, 4-year program (2001 to 2004) to help resolve one of the Bay-Delta's most fundamental conflicts: the competing needs of water management operations and the environment. In September 2004, EWA agencies (Reclamation, DWR, USFWS, National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), and the California Department of Fish and Game (CDFG)) signed a Memorandum of Understanding, extending the EWA program through 2007 in accordance with the CALFED ROD and EWA Operating Principles Agreement (2000). This cooperative management program provides protection to at-risk Delta fisheries through environmentally beneficial changes to CVP and SWP operations, including pumping curtailments in the south Delta. The program is aimed at adding flexibility to the State's water delivery systems, and providing water at critical times to meet environmental needs, without water supply impacts on cities, farms, and businesses. The EWA provides an institutional framework through which water managers can acquire, store, transfer, and release water strategically to respond to fishery and ecosystem needs in the Delta, and in upstream tributaries. The EWA is authorized to use acquired water assets to (1) augment instream flows and Delta outflows, (2) modify or reduce water exports to benefit fisheries, and (3) replace regular project water supply reduced by operations to protect at risk fish (*Developing an Optimal Asset Purchasing Strategy for the CALFED Environmental Water Account*, 2002).

Several tools with which EWA purposes could be pursued were identified in the 2000 EWA Operating Principles Agreement. These tools can be broadly categorized as purchases, borrowing, source shifting, conveyance, and project reoperation. EWA buys water from willing sellers or diverts surplus water when safe for fish, then banks, stores, transfers, and releases the water as needed to protect fish and to compensate water users. EWA implementing agencies have developed water acquisition targets (based on south of Delta delivery) for a long-term EWA operation. Typically, the EWA Program purchases 200,000 to 300,000 acre-feet of water annually.

The EWA is granted 500 cfs of pumping capacity at Banks Pumping Plant during July, August, and September and can use the CVP/SWP JPOD. These and other operations agreements, including coordination with CVPIA Section 3406 (b)(2) releases and relaxation of the export/inflow ratio, could potentially result in approximately 70,000 acre-feet of additional water per year for EWA actions.

The EWA agencies currently implement the EWA Program in accordance with the “Flexible Purchase Alternative,” as described in the EWA Final EIS/EIR (January 2004) and the ROD (March 2004), for the short-term EWA Program. This EIS/EIR analyzed the effects of the short-term EWA Program’s operations on the physical environment through 2007.

Federal legislation enacted in October 2004 authorized appropriations for the EWA for 6 years. Reclamation is leading development of an EIS/EIR for the proposed long-term program that is anticipated to be completed by summer 2007. The proposed long-term EWA is likely to be an acquisitions-based program similar to the short-term EWA. It is expected that the EWA, or a similar water acquisition program, will continue into the future.

Water Use Efficiency Program

The goal of the Water Use Efficiency (WUE) Program is to aggressively make the best use of existing water supplies through defining appropriate water measurement; certifying urban best management practices; and refining quantifiable objectives for agricultural water use efficiency. The program supports local water conservation and recycling projects. Savings resulting from the WUE Program will be accomplished through incentive-based, voluntary programs.

Water Quality Program

The goal of the Water Quality Program is to provide good quality water for all beneficial uses, which include municipal, agricultural, industrial, recreational, and environmental uses both within and outside the Delta. The ROD identifies the following program objectives:

- Improve the reliability and quality of raw water for drinking water needs.
- Reduce constituents in agricultural water that affect operations and crop productivity.
- Improve the reliability and quality of water for industrial needs.
- Improve the quality of raw water for recreational uses, including consumption of aquatic resources.
- Improve the quality of water for environmental needs.

The ROD identified that the CALFED target for providing “safe, reliable, and affordable drinking water in a cost-effective way, is to achieve either (a) average concentrations at Clifton Court Forebay and other south and central Delta drinking water intakes of 50 micrograms per liter ($\mu\text{g/L}$) bromide and 3.0 milligrams per liter (mg/L) total organic carbon (TOC), or (b) an equivalent level of public health protection using a cost-effective combination of alternative source waters, source control, and treatment technologies.”

Water Transfer Program

The Water Transfer Program seeks to develop an effective water transfer market that could stretch existing water supplies by promoting transfers from willing sellers while protecting other water users, local economies, and the environment. The program provides technical information and other resources to facilitate and expedite the water transfer contracting process.

Levee System Integrity Program

The purpose of the Levee System Integrity Program is to reduce the threat of levee failure and seawater intrusion to protect water supplies, water quality, major roadways, cities, towns, agricultural lands, and environmental and aquatic habitat, primarily in the Delta. The program includes funding for local reclamation districts to reconstruct Delta levees to a base level of protection, develop best management practices for beneficial reuse of dredged material, and refine Delta Emergency Management Plans and a Delta Risk Assessment.

Science Program

The long-term goal of the Science Program is to establish a body of knowledge relevant to CALFED actions and their implications. That body of knowledge must be unbiased, relevant, authoritative, integrated across program elements, and communicated to the scientific community, CALFED agency managers, stakeholders, and the public. The Science Program seeks to integrate world-class science and peer review into every aspect of CALFED such that decisions are guided by the best scientific information possible.

Related CALFED Water Management Studies, Projects, and Programs

Ongoing CALFED projects relevant to this feasibility investigation are described below.

Bay Area Water Quality and Water Supply Reliability Program

The Bay Area Water Quality and Water Supply Reliability Program is a joint local agency and regional stakeholder effort funded by a CALFED study grant to explore alternatives for improving water quality and water supply reliability for Bay Area water users. The effort is examining potential projects that would allow Bay Area urban water suppliers to meet drinking water quality program objectives for bromides, TOC, and total dissolved solids (TDS), and to improve water supply reliability in a cost-effective manner. A combination of storage, source control, water exchanges, and other management actions and technology improvements are being considered. Participants include: Alameda County Water District (ACWD), San Francisco Public Utilities Commission (SFPUC), CCWD, EBMUD, San Francisco Bay Area Water Users Association, SCVWD, and Alameda County Flood Control and Water Conservation District Zone 7 (Zone 7).

Common Assumptions for CALFED Surface Water Storage Projects

Efforts are underway primarily by Reclamation and DWR to identify a series of Common Assumptions for use in developing each of the CALFED storage projects. These Common Assumptions would be used to develop without-project conditions, a critical element in the plan formulation process. The Common Assumptions working groups are meant to establish recognized baseline conditions including, at minimum, (1) period of analysis, (2) evaluation levels (i.e., 2001 for existing conditions and 2020 for future conditions), (3) water supply demands, (4) water supply system facilities, (5) regulatory standards, including minimum flow and temperature requirements, (6) system operation criteria, and (7) likely foreseeable actions.

The primary planning analytical tool being used for establishing baseline assumptions for water supply budgeting is the joint Reclamation/DWR simulation model for the CVP-SWP system (CALSIM-II). This mathematical model also is used for studying water supply impacts of various potential alternate system operations and project modifications.

OTHER PROGRAMS AND PROJECTS

Contra Costa Water District Board of Directors Principles of Participation

Commensurate with developing Los Vaqueros Expansion planning and technical documentation, the CCWD Board of Directors on April 19, 2000, adopted seven principles to inform and guide identification of a locally supportable project. These principles state, “Contra Costa Water District will not support a proposal involving the existing Los Vaqueros Project or use of the Los Vaqueros or Kellogg reservoir sites without the following assurances:

- The project improves water quality and reliability for CCWD
- The project enhances the Delta environment
- The project protects and enhances the fisheries and terrestrial species benefits provided by the existing Los Vaqueros Project
- The project preserves and increases the recreation opportunities of the Los Vaqueros Project
- CCWD must retain control of the watershed and operation of the reservoir
- The project protects and reimburses the financial investment made by the CCWD customers, who financed the existing \$450 million Los Vaqueros Project
- The proposal would be placed before the voters of the Contra Costa Water District”

On June 25, 2003, the Board adopted Resolution No. 03-24, in which the Board found 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.”

In accordance with the Principles, continued participation in the LVE was brought before CCWD voters in Measure N and approved on March 2, 2004. Hence, the language of the ballot measure, provided below, is also observed for study purposes.

Shall Contra Costa Water District work with public water agencies to expand Los Vaqueros Reservoir, at no cost to District ratepayers, to: (1) increase water supplies for drought protection; (2) improve drinking water quality; and (3) protect endangered fish in the Delta, on condition that: (a) CCWD water rates will not increase; (b) no water will be exported to Southern California or a peripheral canal; and (c) CCWD will still operate the expanded reservoir?

Contra Costa Water District Alternative Intake Project

CCWD is evaluating the benefits of a new intake in the central Delta to protect and improve water quality for CCWD's customers by accessing better source water quality. The project would help protect CCWD customers from seasonal and drought-caused declines in Delta water quality, ensure that CCWD is able to meet or exceed future drinking water regulatory requirements, and provide increased operational flexibility. Alternatives will be evaluated that may include different intake locations, desalination, and other treatment options. The proposed action could include a new intake and fish screen, pumping plant, and associated pipeline from the new intake to CCWD's Old River Pumping Plant. The proposed project would not increase CCWD's total diversion capacity, but would involve adding a new point of diversion to certain existing water rights held by CCWD and Reclamation. A draft EIS/EIR for the project is planned for early 2006.

Contra Costa Water District Los Vaqueros/Mokelumne Aqueduct Intertie

CCWD is currently pursuing engineering studies for a Los Vaqueros/Mokelumne Aqueduct Intertie. Under an agreement between EBMUD, CCWD, and Sacramento County as part of the Freeport Regional Water Project, this project will consist of facilities to enable up to 3,200 acre-

feet of CCWD's water to be diverted from the Sacramento River at Freeport and wheeled via EBMUD's Mokelumne Aqueduct to CCWD's Los Vaqueros pipeline in Brentwood, California.

Zone 7 Altamont Water Treatment Plant and Altamont Pipeline Project

Zone 7 identified the need for a new water treatment plant (WTP) north of Livermore and potable water transmission facilities to provide sufficient treated water capacity for M&I needs through 2030. An EIR for the proposed Altamont Water Treatment Plant was adopted by the Zone 7 Board of Directors. The *Altamont Pipeline Final EIR* was published and certified in February 2005 and is currently in design. The first phase of the WTP and pipeline is planned to be in service within the 2009 to 2011 time frame.

The WTP will be located off Dyer Road north of Livermore, near the Dyer Canal portion of the SBA, and will receive raw water from the SBA. The ultimate capacity is planned to be 42 million gallons per day (mgd), with a first stage capacity of 24 mgd. The pipeline will begin at the proposed treatment plant site and connect to Zone 7's existing 36-inch Cross Valley Pipeline near Kittyhawk Road in Livermore. The pipeline is expected to be approximately 12 miles in length and up to 48 inches in diameter.

Sacramento Valley Water Management Program (Phase 8)

The purpose of the Sacramento Valley Water Management Program is to promote better water management in the Sacramento Valley and develop additional water supplies through a cooperative water management partnership. The participants include Reclamation, DWR, Sacramento Valley water users, and South of Delta water users. The Program was developed to help resolve water quality and water rights issues arising from the need to meet the flow-related water quality objectives of the 1995 Bay-Delta Water Quality Control Plan and State Water Resources Control Boards Phase 8 Water Rights Hearings process. Implementation of the Sacramento Valley Water Management Program is a two-phase effort: a Short-Term Program, and a Long-Term Program. The Short-Term Program has been developed but not yet implemented, and a Long-term has yet to be identified.

The key provision of the Short-Term Program is the development of project capacity. Upstream water users would implement projects with the capacity to produce up to 185,000 acre-feet of water per year that would otherwise not be available within the Sacramento River watershed. Development of project capacity would be achieved primarily from pumping groundwater in lieu of surface water diversions, and from reservoir reoperation. In addition to conjunctive water management and reservoir reoperation projects, the Short-Term Program Work Plan includes system improvement projects (e.g., canal lining, flow measurement devices), surface water and groundwater planning projects (e.g., feasibility studies), and projects addressing institutional or regulatory barriers. These projects would be implemented for a period of 10 years.

THIS PAGE LEFT BLANK INTENTIONALLY