

RECLAMATION

Managing Water in the West

Program to Meet Standards

**Response to CALFED Bay-Delta Authorization
Act (Public Law 108-361)
CALFED Bay-Delta Program, California**



**U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California**

February 2006

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

**Program to Meet Standards
Response to CALFED Bay-Delta Authorization Act
(Public Law 108-361)
CALFED Bay-Delta Program, California**



U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Sacramento, California

February 2006

Executive Summary

The United States Department of the Interior, Bureau of Reclamation (Reclamation), Mid-Pacific Region, has initiated implementation of a program to provide greater flexibility in meeting existing water quality standards and objectives for which the Central Valley Project (CVP) has responsibility in order to reduce reliance on releases from New Melones Reservoir for those purposes. Implementation of this program is consistent with direction given by Congress in the Water Supply, Reliability, and Environmental Improvement Act (Act; Public Law 108-361) to develop and initiate a Program to Meet Standards (PTMS, Program). The purpose of this report is to summarize the scope, activities, and management approach Reclamation is pursuing for the Program.

Program Authorization

This Program was authorized in Section 103(d)(2)(D) of the Act. The authorization directs the Secretary of the Interior (Secretary), in consultation with the Governor of California, to develop and initiate implementation of a program to meet all existing water quality standards and objectives for which CVP has responsibility. This should be accomplished prior to increasing export limits from the Sacramento-San Joaquin Delta (Delta) for the purposes of conveying water to CVP contractors south of the Delta, or increasing deliveries through an intertie between the California Aqueduct and Delta-Mendota Canal.

Program Scope and Area

The Act clarifies that the purposes of this authority and direction are to provide greater flexibility in meeting existing water quality standards and objectives for which the CVP has responsibility, reduce releases from New Melones Reservoir for those purposes, and assist the Secretary in meeting any obligations to CVP contractors from the New Melones Project (i.e., Central San Joaquin Water Conservation District and Stockton East Water District).

Because of this direction in the Act, the scope of the Program focuses on those water quality standards and objectives that New Melones Reservoir is currently operated to meet. Consistent with this focus, the Program area includes the lower San Joaquin River and lower Stanislaus River areas (see Figure ES-1).

Response to CALFED Authorization Act
Program to Meet Standards



Figure ES-1. Program Area

Water Quality Standards in Program Area

New Melones Reservoir is operated primarily for flood control, water supply to meet water right obligations and to provide CVP contract delivery, instream flow requirements, water temperature requirements, water quality requirements, fishery enhancement, and hydropower generation. The reservoir and Stanislaus River also provide recreation benefits.

Existing operations of New Melones Reservoir are guided by the New Melones Interim Plan of Operation and the San Joaquin River Agreement. The water quality standards that New Melones Reservoir is currently operated to meet were stipulated in water right Decision 1641 (D-1641) issued by the California State Water Resources Control Board (SWRCB), and the 2004 Biological Opinion by National Marine Fisheries Service (NMFS) on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan, including the following:

- Water temperature target in the lower Stanislaus River at Orange Blossom Bridge in Oakdale
- Dissolved oxygen requirements in the lower Stanislaus River near Ripon
- Water quality standards in the San Joaquin River near Vernalis

Reclamation has historically met the terms and conditions of water right permits for operation of the New Melones Project, as required by SWRCB, and is committed to meet these terms and conditions in the future.

D-1641 also includes a requirement for Reclamation to ensure water quality objectives for agricultural beneficial uses in the southern part of the Delta at the following three locations: San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge. Water quality standards at these locations are currently identical to those of the San Joaquin River near Vernalis. However, D-1641 allows latitude in Reclamation's selected method for meeting these requirements. Reclamation and the California Department of Water Resources (DWR) have attempted to meet these requirements by implementing a seasonal rock barrier program in the South Delta. Under the South Delta Improvement Project (SDIP), Reclamation and DWR are currently evaluating installation of four permanent barriers with operable gates to replace the seasonal rock barriers.

Program Development and Implementation

Development and implementation of the Program are summarized in the following sections.

Program Objectives

Objectives of the Program include the following:

- Reduce reliance on releases from New Melones Reservoir for meeting water quality and fishery flow requirements near Vernalis so as to increase water deliveries to CVP contractors.
- Improve water quality conditions in the San Joaquin River above Vernalis.

Program Strategies and Associated Elements

The following strategies and associated Program elements have been identified to achieve the above Program objectives.

Reduce the quantity and improve the timing of salinity discharges to the San Joaquin River above Vernalis The associated Program elements to implement this strategy include the West Side Regional Drainage Plan, Grassland Bypass Project, and Wetlands Best Management Practices Plan.

Provide alternative sources of water for flows in the San Joaquin River near Vernalis The associated Program elements to implement this strategy include Delta-Mendota Canal Recirculation and Water Acquisition from Willing Sellers.

Improve accuracy of New Melones Project operation and planning efforts The associated Program elements to implement this strategy include the New Melones Revised Plan of Operation, CALSIM II Improvement for Planning Efforts, Forecast Model for CVP Allocation, Flow and Water Quality Data Collection, and Level of Certainty Analysis for Meeting San Joaquin River Basin Standards.

The above identified Program elements and their focus will be further investigated, refined, and augmented through public input and stakeholder communications in future Program efforts.

Program Coordination

Implementing the Program is a complex management challenge due to the complicated interrelationships of water operations, regulatory requirements, and stakeholder interests. Reclamation is pursuing a coordinated management approach to develop and implement the Program elements. Reclamation's coordinated management approach also recognizes that the following two

ongoing programs are closely related to, and should be integrated with, the Program.

- Installation of permanent barriers with operable gates under the SDIP (physical changes to address water quality requirements)
- Eastside Integrated Resources Plan (addressing water supply needs)

Reclamation will share information among these programs and coordinate implementation activities to promote Program efficiency, effectiveness, and completeness. Because the Program relies heavily on the accuracy of modeling and forecasting in the Program area, Reclamation’s coordinated approach also includes extensive efforts to upgrade and integrate hydrologic, operations, groundwater, and water quality models.

Reclamation and other Federal and State agencies will coordinate and track the progress of program elements through the Joint Agency Task Force organized under the San Joaquin River Water Quality Management Group. This task force includes representatives of Reclamation, DWR, SWRCB, NMFS, the United States Fish and Wildlife Service, and California Department of Fish and Game. Program status and accomplishments will be reported annually in the CALFED Program Annual Report.

Table ES-1. Summary of Program to Meet Standards

Items	Relative Priority	Comments	Next Major Milestones
<i>Salinity Discharge Reduction and Improvement</i>			
West Side Regional Drainage Plan	High	Source control actions with a high level of local support	Ongoing implementation
Grassland Bypass Project	Medium	Continued implementation of the formulated plan	Ongoing implementation
Wetlands Best Management Practices Plan	High	Source management actions within wildlife refuge areas	Finalized plan in 2006
<i>Alternative Sources for Water Flows</i>			
DMC Recirculation	High	Water management actions that may contribute to flow and water quality objectives, and reduce needs for water acquisition	Plan of Study by May 2006
Water Acquisition from Willing Sellers	Low	Actions that are subject to further appropriation and their needs may be reduced by other water management actions	-
<i>Improvements to Operations and Planning Efforts</i>			
New Melones Revised Plan of Operation	High	Reclamation-committed update for operations plan for greater balance in resource management	Transitional Operation Plan in 2007

Response to CALFED Authorization Act
Program to Meet Standards

Items	Relative Priority	Comments	Next Major Milestones
CALSIM II Improvement for Planning Efforts	Medium	Continued model development to assist CALFED and other planning processes	San Joaquin River Module for Plan Formulation of CALFED Storage Investigation in 2006
Forecast Model for CVP Allocation	Low	Supports for DWR-led efforts	In coordination with DWR efforts
Flow and Water Quality Data Collection	Medium	Continued implementation of the formulated plan	Ongoing implementation
Level-of-Certainty Analysis for Meeting San Joaquin River Basin Standards	Medium	Consolidated efforts to delineate the needs and assurance for meeting standards	Concept plan in 2006
<i>Related Programs to Be Integrated</i>			
Installation of Permanent Barriers with Operable Gates in South Delta Area	High	Strategic implementation for meeting standards in the South Delta	Decision on implementation in 2006
Eastside Integrated Resources Plan	Low	Overall water supply gap analysis for the San Joaquin River eastside tributary areas (on hold for New Melones Transitional Operation Plan)	Appraisal Study Report (on hold)

Key:

CALSIM = California simulated computer model
DMC = Delta-Mendota Canal

CVP = Central Valley Project
DWR = California Department of Water Resources

Contents

	Page
Chapter 1 Introduction.....	1-1
Program Authorization.....	1-1
Program Overview	1-1
Program Scope and Area	1-1
Program Objectives.....	1-3
Program Strategies.....	1-3
Program Coordination.....	1-3
Chapter 2 Existing Standards and Operations	2-1
Hydrology and Facilities of the Stanislaus River Basin	2-1
Operational Requirements for New Melones Reservoir	2-3
Flood Control	2-3
Water Supply	2-3
Water Rights Obligations.....	2-3
CVP Water Service Contracts.....	2-4
Operational Requirements in the Stanislaus River	2-5
Instream Flow Requirements Below New Melones Reservoir.....	2-5
Water Temperature at Orange Blossom Bridge in Oakdale	2-5
River Dissolved Oxygen Requirements near Ripon	2-6
Instream Fishery Management Flow in the Stanislaus River	2-6
Flow and Water Quality Standards in the San Joaquin River.....	2-6
Instream Flow Requirements near Vernalis.....	2-7
Water Quality Standards near Vernalis.....	2-7
Hydropower Operations.....	2-8
Recreation	2-8
Water Quality Requirements in the South Delta.....	2-8
Summary of Historical Operation of New Melones Reservoir.....	2-9
Summary of Existing Operations of New Melones Reservoir.....	2-10
New Melones Interim Plan of Operation	2-10
San Joaquin River Agreement/Vernalis Adaptive Management Plan	2-11
VAMP Flow Objectives.....	2-12
Wet conditions	2-12
Dry conditions.....	2-12
CVP/SWP Export Restrictions	2-13
Chapter 3 Future Conditions Without the Program.....	3-1
Operation of New Melones Reservoir	3-1
Future changes in State regulations	3-1
Irrigation Lands Waivers	3-1
State Water Resources Control Board Total Maximum Daily Load Standards	3-2
Local Efforts	3-4
San Joaquin River Water Quality Management Group	3-4

Chapter 4 Program Development.....	4-1
Program Strategy	4-1
Program Elements.....	4-2
Reduce the Quantity and Improve the Timing of Salinity Discharges to the	
San Joaquin River above Vernalis	4-2
West Side Regional Drainage Plan.....	4-2
Grassland Bypass Project.....	4-2
Wetlands Best Management Practices Plan.....	4-3
Provide Alternative Sources of Water for Flows in the San Joaquin River	
near Vernalis	4-5
Delta-Mendota Canal Recirculation	4-5
Water Acquisition from Willing Sellers	4-6
Improve Accuracy of New Melones Operations and Planning Efforts	4-7
New Melones Revised Plan of Operation.....	4-7
CALSIM II Improvements for Planning Efforts.....	4-8
Forecast Model for CVP Allocation	4-9
Flow and Water Quality Data Collection.....	4-9
Level-of-Certainty Analysis for Meeting San Joaquin Basin Standards	4-9
Related Programs to Be Integrated	4-10
Installation of Permanent Barriers with Operable Gates in South Delta Area	4-10
Eastside Integrated Resources Plan	4-11
Chapter 5 Program Implementation and Coordination	5-1
Program Implementation	5-1
Program Coordination.....	5-1

Tables

Table 1-1 Program Elements.....	1-4
Table 2-1 List of New Melones CVP Contracts	2-4
Table 2-2 San Joaquin River Base Flows near Vernalis per SWRCB D-1641	2-7
Table 2-3 Water Quality Standards of San Joaquin River near Vernalis per SWRCB D-1641	2-7
Table 2-4 Category of Annual Water Supply Conditions per the IPO	2-10
Table 2-5 New Melones IPO Allocation of Annual Water ReleaseS from March through February	2-11
Table 2-6 Single-Step Target Flow for the SJR Near Vernalis per the SJRA	2-12
Table 2-7 60-20-20 Indicator for VAMP	2-13
Table 2-8 CVP and SWP Combined Export Limits during the Spring Pulse Flow Period	2-13
Table 3-1 Actions, Funding Needs, and Sources Recommended by SJRWQMG	3-6

Figures

Figure 1-1 Program Area	1-2
Figure 2-1 Stanislaus River Watershed.....	2-2
Figure 5-1 Program Element Schedule	5-3

This page left blank intentionally.

Abbreviations and Acronyms

Act	Water Supply, Reliability, and Environmental Improvement Act
AF	acre-feet
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins
Bay-Delta Plan	1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
BMP	Best Management Practice
CALSIM	California simulation computer model
CDFG	California Department of Fish and Game
Cfs	cubic feet per second
Coalition	San Joaquin Valley Westside Coalition
Conditional Waiver	Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigation Lands Within the Central Valley Region
CSJWCD	Central San Joaquin Water Conservation District
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Federal Clean Water Act
CWC	California Water Code
Delta	Sacramento-San Joaquin Delta
DMC	Delta-Mendota Canal
DO	dissolved oxygen
DWR	California Department of Water Resources
DWSC	Stockton Deep Water Ship Channel
D-xxxx	State Water Resources Control Board Decision xxxx
EC	electrical conductivity
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
°F	degrees Fahrenheit
GRCD	Grassland Resource Conservation District
GWD	Grassland Water District
IPO	Interim Plan of Operation
MAF	million acre-feet
mg/L	milligram per liter
mmhos/cm	millimhos per centimeter
mS/cm	milliSiemens per centimeter
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OCAP	Long-Term Central Valley Project Operations Criteria and Plan
OID	Oakdale Irrigation District
PG&E	Pacific Gas and Electric Company
ppm	part per million
Program	Program to Meet Standards
Public Law 108-361	Water Supply, Reliability, and Environmental Improvement Act
Reclamation	United States Department of the Interior, Bureau of Reclamation

Table of Contents

RPO	New Melones Revised Plan of Operation
SB	Senate Bill
SDIP	South Delta Improvement Project
Secretary	Secretary of the Interior
SJRA	San Joaquin River Agreement
SJRWQMG	San Joaquin River Water Quality Management Group
SLDMWA	San Luis and Delta-Mendota Water Authority
South Delta	southern part of the Sacramento-San Joaquin Delta
SEWD	Stockton East Water District
SSJID	South San Joaquin Irrigation District
SWP	State Water Project
SWRCB	California State Water Resources Control Board
TDS	total dissolved solids
TMDL	total maximum daily load
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VAMP	Vernalis Adaptive Management Plan
WDR	Waste Discharge Requirement

Chapter 1

Introduction

The United States Department of the Interior, Bureau of Reclamation, (Reclamation) Mid-Pacific Region, has initiated implementation of a program to provide greater flexibility in meeting existing water quality standards and objectives for which the Central Valley Project (CVP) has responsibility in order to reduce reliance on releases from New Melones Reservoir for those purposes. Implementation of this program is consistent with direction given by Congress in the Water Supply, Reliability, and Environmental Improvement Act (Act; Public Law 108-361) to develop and initiate a Program to Meet Standards (PTMS, Program). The purpose of this report is to summarize the scope, activities, and management approach Reclamation is pursuing for the Program.

Program Authorization

This Program was authorized in Section 103(d)(2)(D) of the Act. The authorization directs the Secretary of the Interior (Secretary), in consultation with the Governor of California, to develop and initiate implementation of a program to meet all existing water quality standards and objectives for which CVP has responsibility. This should be accomplished prior to increasing export limits from the Sacramento-San Joaquin Delta (Delta) for the purposes of conveying water to CVP contractors south of the Delta, or increasing deliveries through an intertie between the California Aqueduct and Delta-Mendota Canal (DMC).

Program Overview

This section describes the Program area, scope, objectives, strategies, and coordination.

Program Scope and Area

The Act clarifies that the purposes of this authority and direction are to provide greater flexibility in meeting existing water quality standards and objectives for which the CVP has responsibility, reduce releases from New Melones Reservoir for those purposes, and to assist the Secretary in meeting any obligations to CVP contractors from the New Melones Project (i.e., Central San Joaquin Water Conservation District [CSJWCD] and Stockton East Water District [SEWD]). Because of this direction in the Act, the scope of the Program focuses on those water quality standards and objectives that New Melones Reservoir is currently operated to meet. Consistent with this focus, the Program

area includes the lower San Joaquin River and lower Stanislaus River areas, as shown in Figure 1-1.

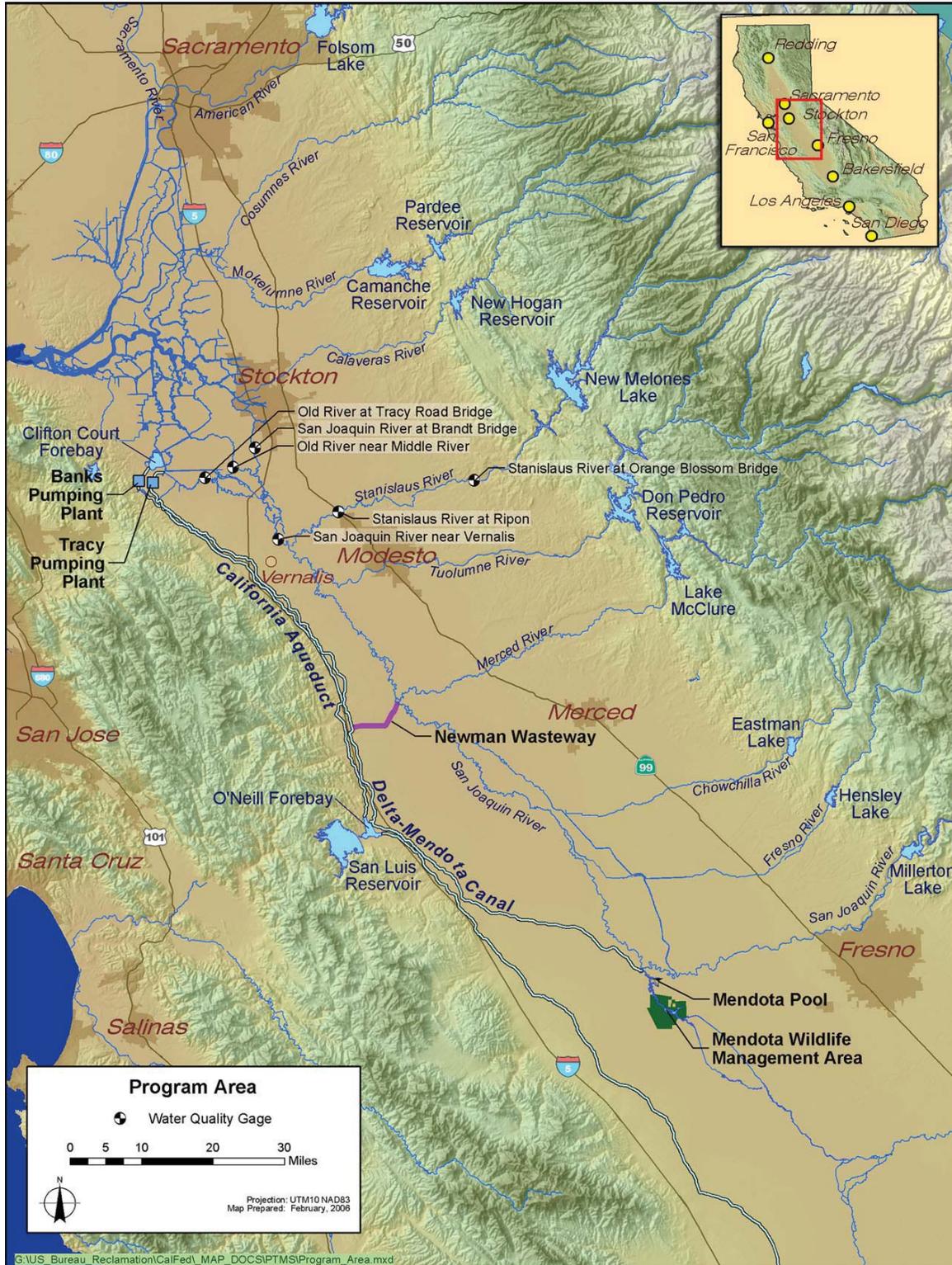


Figure 1-1. Program Area

Program Objectives

Objectives of the Program include the following:

- Reduce reliance on releases from New Melones Reservoir for meeting water quality and fishery flow requirements near Vernalis so as to increase water deliveries to CVP contractors.
- Improve water quality conditions in the San Joaquin River above Vernalis.

Program Strategies

As described in the remainder of this report, Reclamation has identified the following strategies to achieve Program objectives.

- Reduce the quantity and improve the timing of salinity discharges to the San Joaquin River above Vernalis.
- Provide alternative sources of water for flows in the San Joaquin River near Vernalis.
- Improve accuracy of New Melones Project operation and planning efforts.

Table 1-1 lists specific program elements to implement these strategies.

Program Coordination

Implementing the Program is a complex management challenge due to the complicated interrelationships of water operations, regulatory requirements, and stakeholder interests. Reclamation is pursuing a coordinated management approach to develop and implement the Program elements listed in Table 1-1.

Reclamation's coordinated management approach also recognizes that the following two ongoing programs are closely related to, and should be integrated with, the Program.

- Installation of permanent barriers with operable gates under the South Delta Improvement Program (SDIP) (physical changes to address water quality requirements).
- Eastside Integrated Resources Plan (addressing water supply needs).

Reclamation will share information among these programs and coordinate implementation activities to promote Program efficiency, effectiveness, and completeness.

Because the Program relies heavily on the accuracy of modeling and forecasting in the Program area, Reclamation's coordinated approach also includes extensive efforts to upgrade and integrate hydrologic, operations, groundwater, and water quality models.

Table 1-1. Program Elements

Program Elements	Initiated Consistent with Authorization? (Next Major Milestones)
<i>Salinity Discharge Reduction and Improvement</i>	
West Side Regional Drainage Plan	Yes; (Completion of planning process by 2006)
Grassland Bypass Project	Yes; (Ongoing implementation)
Wetlands Best Management Practices Plan	Yes; (Finalized plan in 2006)
<i>Alternative Sources for Water Flows</i>	
DMC Recirculation	Yes; (Plan of Study by May 2006)
Water Acquisition from Willing Sellers	- (-)
<i>Improvements to Operations and Planning Efforts</i>	
New Melones Revised Plan of Operation	Yes; (Transitional Operation Plan in 2007)
CALSIM II Improvement for Planning Efforts	Yes; (San Joaquin River Module for Plan Formulation of CALFED Storage Investigation in 2006)
Forecast Model for CVP Allocation	Yes; (In coordination with DWR efforts)
Flow and Water Quality Data Collection	Yes; (Ongoing implementation)
Level-of-Certainty Analysis for Meeting San Joaquin River Basin Standards	- (Concept plan in 2006)

Key:

- = Not applicable

CALSIM = California simulation computer model

DMC = Delta-Mendota Canal

CVP = Central Valley Project

DWR = California Department of Water Resources

Reclamation and other Federal and State agencies will coordinate and track the progress of program elements through the Joint Agency Task Force organized under the San Joaquin River Water Quality Management Group (SJRWQMG). This task force includes representatives of Reclamation, the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Water Resources (DWR), California State Water Resources Control Board (SWRCB), and California Department of Fish and Game (CDFG). Program status and accomplishments will be reported annually in the CALFED Program Annual Report.

Chapter 2

Existing Standards and Operations

This chapter summarizes existing standards in the Program area (see Figure 1-1) that affect the operation of New Melones Reservoir, and discusses current operation of New Melones Reservoir in meeting these standards.

Hydrology and Facilities of the Stanislaus River Basin

The Stanislaus River originates in the western slopes of the Sierra Nevada range and drains a watershed of approximately 900 square miles. The river forms the boundary between Calaveras and Tuolumne counties. Figure 2-1 shows the Stanislaus River watershed.

The average unimpaired runoff in the basin is approximately 1.2 million acre-feet (MAF) per year; median historical unimpaired runoff is 1.1 MAF per year. Snowmelt contributes the largest portion of flows in the Stanislaus River, with the highest runoff occurring in April, May, and June. Agricultural water supply development in the Stanislaus River watershed began in the 1850s and has significantly altered the basin's hydrologic conditions.

The New Melones Dam and Powerplant are located on the Stanislaus River, about 60 miles upstream from its confluence with the San Joaquin River, and 40 miles east of Stockton. The New Melones Reservoir was completed by the United States Army Corps of Engineers (USACE) in 1978, and approved for filling in 1983, with a storage capacity of about 2.4 MAF. The New Melones Unit (of the Eastside Division) was officially transferred to Reclamation in November 1979 for operational and financial integration as a unit of the CVP; however, its water supply is to provide for needs in the Stanislaus Basin first before being considered for other areas outside the basin.

Another major project in the Stanislaus River Basin is the Tri-Dam Project, owned and operated by Oakdale Irrigation District (OID) and South San Joaquin Irrigation District (SSJID). The Tri-Dam Project consists of Donnell Dam, Reservoir, and Powerplant; Beardsley Dam, Reservoir, and Powerplant on the Middle Fork Stanislaus River upstream from New Melones Dam; and Tulloch Dam, Reservoir, and Powerplant located immediately downstream from New Melones Dam. Tulloch Reservoir provides afterbay storage for re-regulating power releases from New Melones Powerplant under contractual arrangements between Reclamation and these two districts. Goodwin Dam, which was constructed by OID and SSJID in 1912, creates a re-regulating reservoir for

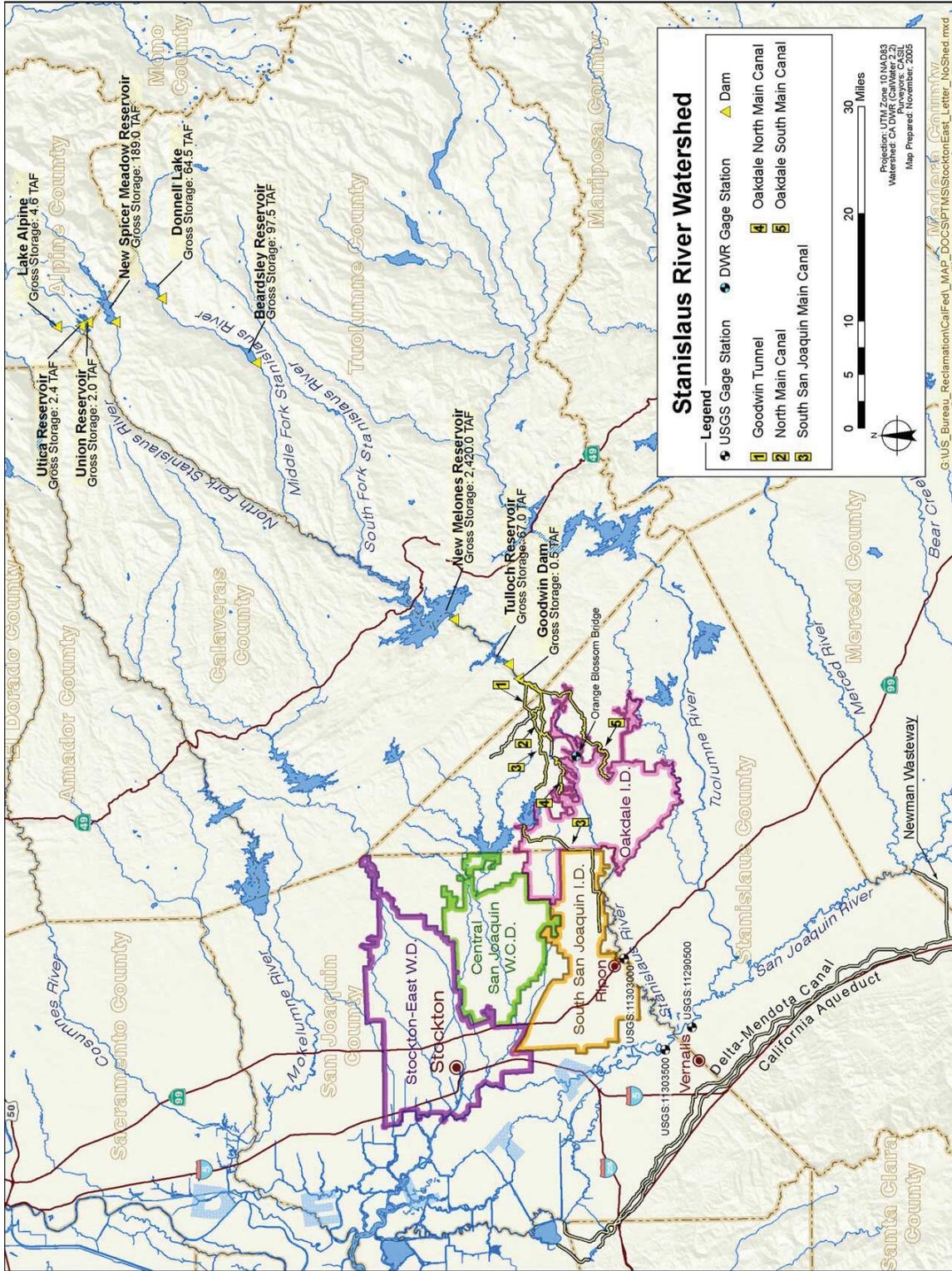


Figure 2-1. Stanislaus River Watershed

releases from Tulloch Powerplant and provides for diversions to canals north and south of the Stanislaus River for delivery to OID and SSJID. Water impounded behind Goodwin Dam may be pumped into Goodwin Tunnel for deliveries to CSJWCD and SEWD.

Storage projects upstream from New Melones Reservoir on the North Fork Stanislaus River consist of Pacific Gas and Electric (PG&E) Company's Lake Alpine, Utica Reservoir, Union Reservoir, and Spicer Reservoir. Also owned and operated by PG&E are Relief Reservoir; Stanislaus Powerplant; Spring Gap Powerplant, on the Middle Fork Stanislaus River; and Strawberry and Lyons reservoirs on the South Fork Stanislaus River.

Twenty unaged tributaries contribute flow to the lower Stanislaus River below Goodwin Dam. These streams provide intermittent flows, occurring primarily during November through April. The lower Stanislaus River also receives agricultural return flows, groundwater accretions, and operational spills from irrigation canals receiving water from both the Stanislaus and Tuolumne rivers.

Operational Requirements for New Melones Reservoir

New Melones Reservoir is operated primarily for flood control, water supply, instream flow requirements, fishery enhancement, water quality improvement, and hydropower generation. The reservoir and Stanislaus River also provide recreation benefits.

Flood Control

Up to 450,000 acre-feet (AF) of the 2.4 MAF storage volume in New Melones Reservoir is dedicated for flood control. New Melones Reservoir flood control operation is coordinated with the operation of Tulloch Reservoir, of which 10,000 AF of storage is set aside for flood control. Based on flood control diagrams prepared by USACE, part or all of the dedicated flood control storage may be used for conservation storage, depending on the time of year and concurrent flood hazard. The flood control objective is to maintain flood flows at the Orange Blossom Bridge at less than 8,000 cubic feet per second (cfs). When possible, however, releases from Tulloch Dam are maintained at levels that would not result in downstream flows in excess of 1,250 to 1,500 cfs because of seepage problems in agricultural lands adjoining the river associated with flows above this level.

Water Supply

Water supply provided by New Melones Reservoir is to meet water right obligations and to provide CVP contract delivery.

Water Rights Obligations

The original Melones Dam, constructed in 1924, was owned and operated by OID and SSJID. Prior to completion of New Melones Dam, Reclamation

entered into a water right Agreement and Stipulation with OID and SSJID in 1972 because New Melones Dam and Reservoir inundated the original project. The 1972 Agreement and Stipulation required that Reclamation release inflows to New Melones Reservoir of up to 654,000 AF per year for diversion at Goodwin Dam by OID and SSJID, in recognition of their prior water rights. Actual historical diversions prior to 1972 varied considerably depending on hydrologic conditions. In addition to releases for diversion by OID and SSJID, water is released from New Melones Reservoir to satisfy riparian water rights totaling approximately 48,000 AF annually downstream from Goodwin Dam.

New Melones Dam was completed in 1978, and initial filling began in 1983. In 1988, following a year of low inflow to New Melones Reservoir, the 1972 Agreement and Stipulation was superseded by an agreement that provided for conservation storage by OID and SSJID. The new agreement required Reclamation to release New Melones Reservoir inflows of up to 600,000 AF per year for diversion at Goodwin Dam by OID and SSJID.

In years when annual inflows to New Melones Reservoir are less than 600,000 AF, Reclamation provides all inflows plus one-third the difference between the inflow for that year and 600,000 AF per year. The 1988 Agreement and Stipulation created a conservation account in which the difference between the entitled quantity and the actual quantity diverted by OID and SSJID in a year may be stored in New Melones Reservoir for use in subsequent years. This conservation account has a maximum storage limit of 200,000 AF, and withdrawals are constrained by criteria in the 1988 Agreement and Stipulation.

CVP Water Service Contracts

Reclamation entered into water service contracts for delivery of water from New Melones Reservoir, based on a 1980 hydrologic evaluation of the long-term availability of water in the Stanislaus River Basin. Based on this study, Reclamation entered into long-term water service contracts with CSJWCD and SEWD for interim and firm supplies totaling up to 155,000 AF per year (see Table 2-1). Firm supplies of up to 49,000 AF per year were contracted based on the portion of CSJWCD that lies within the Stanislaus River Basin. Interim supplies, up to a total of 106,000 AF per year, were to be made available until in-basin uses increased in the future.

Table 2-1. List of New Melones CVP Contracts

CVP Contractor	Maximum Contract Amount
Central San Joaquin Water Conservation District	80,000 af/yr
Stockton East Water District	75,000 af/yr

Key:

af/yr = acre feet per year

CVP = Central Valley Project

Because diversion facilities were not yet fully operational, and water supplies were not available during the 1987 to 1992 drought, no water was made available from the Stanislaus River for delivery to CVP contractors prior to 1992. Since 1997, delivery to CVP contractors from New Melones Reservoir has been governed by the 1997 Interim Plan of Operation (IPO). More details on the IPO and existing operation are provided in later discussion in this chapter.

Operational Requirements in the Stanislaus River

Reclamation operates New Melones Reservoir according to a set of operational requirements for instream flow, fishery release, and water quality. Many of these requirements were stipulated in SWRCB Decision 1422 (D-1422) for approving water right permits associated with the New Melones Project. Portions of this decision were later superseded by Decision 1641 (D-1641), as revised in 2000.

Instream Flow Requirements Below New Melones Reservoir

Under D-1422, Reclamation is required to release 98,000 AF of water per year from New Melones Reservoir to the Stanislaus River, with a reduction to 69,000 AF in critical years, on a distribution pattern to be specified each year by CDFG for fish and wildlife purposes. In 1987, an agreement between Reclamation and CDFG provided for increased releases from New Melones Reservoir to enhance fishery resources for an interim period, during which habitat requirements were to be better defined, and a study of Chinook salmon fisheries on the Stanislaus River would be completed.

During the study period, releases for instream flows would range from 98,300 to 302,100 AF per year. The exact quantity to be released each year was to be determined based on storage, projected inflows, projected water supply, water quality demands, projected CVP contractor demands, and target carryover storage. Because of dry hydrologic conditions in the 1987 to 1992 drought period, the ability to provide increased releases was limited. USFWS published the results of a 1993 study that recommended a minimum instream flow on the Stanislaus River of 155,700 AF per year for spawning and rearing. Reclamation addressed this recommendation through implementing the IPO.

Water Temperature at Orange Blossom Bridge in Oakdale

Water temperatures in the lower Stanislaus River are affected by many factors and operational tradeoffs, including available cold water resources in New Melones Reservoir, Goodwin release rates for fishery flow management and water quality objectives, and residence time in Tulloch Reservoir, as affected by local irrigation demand. The previous established temperature target is 65 degrees Fahrenheit (°F) in the lower Stanislaus River at Orange Blossom Bridge in Oakdale (river mile 58.5) for Central Valley steelhead incubation and rearing from late spring through summer. This objective has been met since 1999, but may not be sustainable in critical dry years or drought periods.

The 2004 Biological Opinion by NMFS on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP) stipulates water temperature target of 65 °F in the lower Stanislaus River at Orange Blossom Bridge during the period of June 1 through November 30 to protect rearing of juvenile Central Valley steelhead. The 2004 OCAP Biological Opinion states that Reclamation should coordinate water temperature releases with CDFG and USFWS to use fishery release water, to the extent possible, consistent with the IPO, D-1641, and the Central Valley Project Improvement Act (CVPIA; Title 34 of Public Law 102-575). If the above temperature targets are unachievable, Reclamation shall consult with CDFG, USFWS, and NMFS to maximize suitable rearing habitat for steelhead in the Stanislaus River below Goodwin Dam prior to June 1 each year.

River Dissolved Oxygen Requirements near Ripon

D-1422 requires that water be released from New Melones Reservoir to maintain dissolved oxygen (DO) standards in the Stanislaus River near Ripon. This condition was amended in D-1641, which requests Reclamation to meet a DO standard as specified in the Water Quality Control Plan for the Sacramento and San Joaquin river basins (Basin Plan). The current standard requires a minimum DO concentration of 7 milligrams per liter (mg/L), as measured on the Stanislaus River near Ripon.

Instream Fishery Management Flow in the Stanislaus River

The CVPIA modified the original CVP authorization (Rivers and Harbors Act of 1937) and added mitigation, protection, and restoration of fish and wildlife as a project purpose. Further, the CVPIA specified that dams and reservoirs of the CVP should now be used “first, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and fish and wildlife mitigation, protection and restoration purposes; and third, for power and fish and wildlife enhancement.”

Instream fishery management flow volumes on the Stanislaus River are defined in the IPO. The volumes represent a combination of fishery flows pursuant to the 1987 CDFG Agreement and implementation of CVPIA Section 3406(b)(2). More details on the IPO are provided in a later discussion in this chapter.

Flow and Water Quality Standards in the San Joaquin River

Reclamation was issued water rights to appropriate water by SWRCB for the CVP. Many of the rights for the CVP were issued pursuant to SWRCB D-990 in 1961. Several other decisions and SWRCB actions cover remaining rights for the CVP. These rights contain terms and conditions that must be complied with in the operation of the CVP. Over time, SWRCB has issued further decisions that modify these terms and conditions. The latest modifications were the 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), and D-1641, as revised in March 2000, for requiring CVP and State Water Project (SWP) to operate to flow and water quality standards established in the Bay-Delta Plan.

Instream Flow Requirements near Vernalis

D-1641 sets flow requirements on the San Joaquin River near Vernalis from February to June (see Table 2-2). These flows are commonly known as San Joaquin River base flows. Since D-1641 has been in place, San Joaquin base flow requirements have, at times, been an additional demand on the New Melones Reservoir water supply beyond that anticipated in the IPO. Because these base flow requirements are a fish and wildlife objective established after the CVPIA, any additional CVP releases to meet this objective are accounted for as a CVPIA Section 3406(b)(2) fish action.

Table 2-2. San Joaquin River Base Flows near Vernalis per SWRCB D-1641

Water Year Class¹	Base Flow² (February through June)
Above Normal and Wet	2,130 cfs or 3,420 cfs
Dry and Below Normal	1,420 cfs or 2,280 cfs
Critical	710 cfs or 1,140 cfs

Notes:

¹ Based on San Joaquin Valley 60-20-20 Index.

² The higher flow objective applies when the 2-part-per-thousand isohaline (measured as 2.64 mmhos/cm surface salinity) is required to be at or west of Chipps Island.

Key:

cfs = cubic feet per second

D-1641 = State Water Resources Control Board Decision-1641

Water Quality Standards near Vernalis

D-1422 also specifies that New Melones Reservoir be operated to maintain an average monthly total dissolved solids (TDS) level, commonly measured as a conversion from electrical conductivity (EC), in the San Joaquin River near Vernalis as it enters the Delta. D-1641 modified these water quality objectives for the San Joaquin River near Vernalis to include the irrigation and nonirrigation season objectives contained in the Bay-Delta Plan (see Table 2-3), and also to change the standards from TDS levels in parts per million (ppm) to salinity in terms of EC. Releases from New Melones Reservoir for meeting water quality requirements in the San Joaquin River near Vernalis are not accounted for as CVPIA Section 3406(b)(2) fish action because these objectives are established for agricultural purposes.

Table 2-3. Water Quality Standards of San Joaquin River near Vernalis per SWRCB D-1641

Months¹	Water Quality Standard
April through August	0.7 mS/cm
September through March	1.0 mS/cm

Notes:

¹ All water year types.

Key:

mS/cm = (milliSiemens per centimeter)

SWRCB D-141 = State Water Resources Control Board Decision 1641

Hydropower Operations

New Melones Powerplant operations began in 1979. The New Melones Power plant consists of two generating units with a maximum operating capability of 383,000 kilowatts. The maximum powerplant release is 8,928 cfs. Power generation occurs when reservoir storage is above the minimum power pool of 300,000 AF. When possible, reservoir levels are maintained to provide maximum energy generation. However, no specific objectives were established for New Melones Powerplant operations.

Recreation

New Melones Reservoir, Tulloch Reservoir, and the lower Stanislaus River provide significant recreation opportunities, principally boating and fishing in the lakes, and rafting and fishing in the river. Rafting interests are notified concerning flow management at Goodwin Dam during spring and fall pulse flows for rafting opportunities and safety concerns. However, no specific objectives were established for New Melones Reservoir and its operation for recreational purposes.

Water Quality Requirements in the South Delta

One requirement of D-1641 for Reclamation is to ensure water quality objectives for agricultural beneficial uses in the southern part of the Delta (South Delta) at the following three locations: San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge. Water quality standards at these locations are currently identical to those of the San Joaquin River near Vernalis (see Table 2-3).

However, D-1641 notes, “The 0.7 EC objective becomes effective on April 1, 2005. The DWR and Reclamation shall meet 1.0 EC at these stations year round until April 1, 2005. The 0.7 EC objective is replaced by the 1.0 EC objective from April through August after April 1, 2005 if permanent barriers are constructed, or equivalent measures are implemented, in the South Delta and an operations plan that reasonably protects South Delta agriculture is prepared by the DWR and Reclamation and approved by the Executive Director of the SWRCB. The SWRCB will review the salinity objectives for the South Delta in the next review of the Bay-Delta objectives following construction of the barriers.” D-1641 allows latitude in Reclamation’s selected method for meeting these requirements. Reclamation and DWR have attempted to meet these requirements by implementing a seasonal rock barrier program in the South Delta. Under the SDIP, Reclamation and DWR are currently evaluating the installation of four permanent barriers with operable gates to replace the seasonal rock barriers.

Summary of Historical Operation of New Melones Reservoir

Filling of New Melones Reservoir began in 1978. However, in response to protests to SWRCB, complete filling was prohibited. This restriction was eventually lifted when large inflows in 1982 and 1983 made preventing the reservoir from filling unrealistic. In January 1983, Reclamation requested reconsideration of the restriction in D-1422 against filling New Melones for power generation. By SWRCB Water Right Order 83-3, the SWRCB amended D-1422 and allowed storage in New Melones Reservoir for power generation and consumptive uses.

From the initial partial filling in 1978 through 1994, water quality requirements for New Melones Reservoir were defined in D-1422 and D-1485. Reclamation released from New Melones Reservoir to meet the DO standard (7 mg/L or better at all times) in the Stanislaus River at Ripon and TDS level (monthly average of 500 ppm) in the San Joaquin River near Vernalis.

Initially, operators of New Melones Reservoir were able to meet the Ripon and Vernalis standards. However, the 1987 through 1992 drought resulted in reduced storage in New Melones Reservoir through 1994. New Melones Reservoir reached a low point of approximately 80,000 AF in September 1992, making full compliance impossible. Beginning in 1989 and continuing through 1994, Reclamation operators chose to accept violations of the previous Vernalis standard to avoid more substantial violations later in the season. This strategy was discussed frequently in meetings with parties concerned about operations of New Melones Reservoir; parties included OID, SSJID, SEWD, USFWS, CDFG, the Western Area Power Administration, and South Delta Water Agency.

In the Bay-Delta Plan, water quality standard for the San Joaquin River near Vernalis was changed in units to EC, with a maximum 30-day average of mean daily EC standard of 0.7 millimhos per centimeter (mmhos/cm) from April through August, and an EC standard of 1.0 mmhos/cm from September through March (later codified in D-1641). The Ripon DO standard was not changed. Neither the Ripon DO nor the Vernalis EC standards have been violated since summer 1994.

Pursuant to D-1641, the water right permits for direct diversions and storage of the New Melones Project were amended to provide for modified water quality and fish flow objectives for the San Joaquin River near Vernalis, and to provide for water supply.

Summary of Existing Operations of New Melones Reservoir

The existing operation of New Melones Reservoir is guided by the IPO and the San Joaquin River Agreement (SJRA).

New Melones Interim Plan of Operation

The IPO was developed as a joint effort between Reclamation and USFWS in conjunction with the Stanislaus River Basin Stakeholders. The process of developing a long-term management plan for New Melones Reservoir began in 1995, but the focus shifted in 1996 to development of an interim operations plan for 1997 and 1998. Although meant to be a short-term plan, the IPO continues to be the guiding operations criteria in effect for annual planning to meet beneficial uses from New Melones Reservoir.

The IPO defines five categories of annual water supply based on a composite index of end-of-February storage in New Melones Reservoir, and forecasted reservoir inflow from March through September. Table 2-4 summarizes numerical criteria for the five categories of annual water supply.

Table 2-4. Category of Annual Water Supply Conditions per the IPO

Annual Water Supply Category	March-Through-September Forecasted Reservoir Inflow Plus End-of-February Reservoir Storage
Low	0 to 1,400 TAF
Medium-low	1,400 TAF to 2,000 TAF
Medium	2,000 TAF to 2,500 TAF
Medium-high	2,500 TAF to 3,000 TAF
High	3,000 TAF to 6,000 TAF

Key:

IPO = Interim Plan of Operation

TAF = thousand acre feet

For each category of annual water supply, the IPO allocates annual water releases from March through February for instream fishery management per the 1987 CDFG agreement, CVPIA Section 3406(b)(2) management, D-1641 San Joaquin River water quality standards, D-1641 San Joaquin River base flow near Vernalis, and CVP contract delivery. Table 2-5 shows the flow allocations. (The measurement point for water releases is at Goodwin Dam.) Annual allocations for these purposes will be determined by interpolating the hydrologic index shown in Table 2-4. Note that allocations to OID and SSJID will be pursuant to the 1988 Agreement between Reclamation and these two districts without being affected by the IPO.

Table 2-5 shows allocation suggests that the IPO only supports limited release volumes from New Melones Reservoir toward meeting the D-1641 water quality standards for the San Joaquin River near Vernalis. Under certain hydrologic conditions, implementing the IPO allocation may not fully meet the requirements. As part of water right permit requirements, additional volume is dedicated to meeting these water quality standards before any allocation can be

made to CVPIA Section 3406(b)(2) uses or CVP contract delivery because water quality standards for the San Joaquin River near Vernalis existed before enactment of the CVPIA.

Table 2-5. New Melones IPO Allocation of Annual Water Releases from March through February

Annual Water Supply Category	Annual Allocation from March Through February by Purpose							
	Fishery Management		D-1641 Water Quality Standards		D-1641 Flow Standards		CVP Contract Delivery	
	From	To	From	To	From	To	From	To
Low	Conference with the Stanislaus River Basin Stakeholders							
Medium-low	98 TAF	125 TAF	70 TAF	80 TAF	0	0	0	0
Medium	125 TAF	345 TAF	80 TAF	175 TAF	0	0	0	59 TAF
Medium-high	345 TAF	467 TAF	175 TAF	250 TAF	75 TAF	75 TAF	90 TAF	90 TAF
High	467 TAF	467 TAF	250 TAF	250 TAF	75 TAF	75 TAF	90 TAF	90 TAF

Key:

CVP = Central Valley Project

D-1641 = State Water Resources Control Board Decision-1641

IOP = Interim Plan of Operation

TAF = thousand acre fee

The water supply allocation also suggests that the IPO only supports meeting the D-1641 San Joaquin River base flow near Vernalis from the Stanislaus River when water supply conditions are determined to be in the high and medium-high categories, and limited to reservoir release of 75,000 AF per year. Because these base flow requirements are a fish and wildlife objective established after the CVPIA, releases from New Melones Reservoir to meet this objective are accounted for as a CVPIA Section 3406(b)(2) fish action. Reclamation currently relies on the SJRA to provide for additional flows from other tributary reservoirs to meet San Joaquin River base flow requirements.

San Joaquin River Agreement/Vernalis Adaptive Management Plan

The SJRA is a settlement agreement to identify feasible voluntary actions to protect fish resources in the San Joaquin River and implement the flow objectives in the Bay-Delta Plan for the San Joaquin River near Vernalis. Parties to the SJRA include agencies that contribute flow to the San Joaquin River, divert from or store water on tributaries to the San Joaquin River, or have an element of control over flows in the lower San Joaquin River.

Adopted by SWRCB in D-1641, the SJRA includes a 12-year experimental program providing for flows and exports in the lower San Joaquin River during a 31-day pulse flow period from April and May. SJRA also provides for experimental data collection for salmon survival during that period to further understanding of the effects on salmon survival of flows, exports, and the barrier at the head of Old River. This experimental program is commonly referred to as the Vernalis Adaptive Management Plan (VAMP). VAMP has two distinct components: flow and corresponding export restriction. Flow objectives were designed to provide protection similar to the objectives defined in the Bay-Delta Plan.

VAMP Flow Objectives

Within the SJRA, the IPO is the assumed baseline operation for New Melones Reservoir, which forms part of the existing flow condition in the San Joaquin River. The existing flow condition is used to compute supplemental flows that will be provided on the San Joaquin River to meet target flows for the 31-day pulse flow period during April and May. Supplemental flows will be provided from other sources in the San Joaquin River Basin under the control of parties to the SJRA. Participating agencies providing supplemental flows include the Exchange Contractors, from the San Joaquin River; Merced Irrigation District, from the Merced River; Modesto Irrigation District/Turlock Irrigation District, from the Tuolumne River; and OID and SSJID, from the Stanislaus River. The maximum amount of contribution to VAMP flows from these agencies is capped at 110,000 AF per year. Real-time coordination for VAMP operation is managed by a hydrology group, which includes designees with technical expertise from each agency that contributes water to VAMP.

The target flow for the San Joaquin River near Vernalis for the spring pulse flow period is determined each year according to specifications contained in the SJRA. The target flow is determined prior to the spring pulse flows as an increase above the existing flows and thus, “adapts” to the prevailing hydrologic conditions. Table 2-6 shows the single-step target flow for the San Joaquin River near Vernalis per the SJRA. The single-step target flow will be in effect except in extreme hydrologic conditions.

Table 2-6. Single-Step Target Flow for the SJR near Vernalis per the SJRA

Existing Flow	Single-Step Target Flow
0 – 1,999 cfs	2,000 cfs
2,000 – 3,199 cfs	3,200 cfs
3,200 – 4,449 cfs	4,450 cfs
4,450 – 5,699 cfs	5,700 cfs
5,700 – 6,999 cfs	7,000 cfs
7,000 cfs or greater	Existing flow

Source: San Joaquin River Agreement

Key:

cfs = cubic feet per second

SJR = San Joaquin River

SJRA = San Joaquin River Agreement

Wet conditions In any year when the sum of the current year’s 60-20-20 indicator (see Table 2-7) and previous year’s 60-20-20 indicator is 7 or greater, an annual 31-day out-migration flow target will be the target flow, one level higher than that established by the single-step target flow in Table 2-6. This is called double-step target flow.

Dry conditions During years when the sum of the current year’s 60-20-20 indicator and the previous 2 years’ 60-20-20 indicator is 4 or less, participating agencies will not provide supplemental flows to the San Joaquin River.

The above criteria of VAMP flows in the SJRA suggest that the SJRA supports only up to 100,000 AF per year of supplemental flows from participating agencies. If the target flows require that a volume of supplemental releases exceeds 100,000 AF per year, Reclamation will acquire additional water from willing sellers to meet the target flows. Furthermore, the SJRA does not support supplemental flows in dry conditions; Reclamation may acquire additional water from willing sellers for meeting the flow standards in the San Joaquin River near Vernalis.

Table 2-7. 60-20-20 Indicator for VAMP

San Joaquin Valley 60-20-20 Water Year Type ¹	VAMP 60-20-20 Indicator
Wet	5
Above Normal	4
Below Normal	3
Dry	2
Critical	1

Source: San Joaquin River Agreement

Notes:

¹ Defined in SWRCB D-1641

Key:

SWRCB D-1641 = State Water Resources Control Board Decision D-1641

VAMP = Vernalis Adaptive Management Plan

CVP/SWP Export Restrictions

Export reduction during the VAMP period applies to both CVP and SWP pumps at the Delta. The SJRA includes specifications for the combined export targets for the 31-day period (see Table 2-8). Typically, the reduction for CVP export is accounted for as a CVPIA Section 3406(b)(2) action for the Bay-Delta Plan; the reduction for SWP export is covered by actions for the Environmental Water Account.

Table 2-8. CVP and SWP Combined Export Limits during the Spring Pulse Flow Period

Export Limits	Vernalis Target Flow				
	2,000 cfs	3,200 cfs	4,450 cfs	5,700 cfs	7,000 cfs
1,500 cfs	X	X	X		X
2,250 cfs				X	
3,000 cfs					X

Source: San Joaquin River Agreement

Key:

cfs = cubic feet per second CVP = Central Valley Project

SWP = State Water Project

This page left blank intentionally.

Chapter 3

Future Conditions Without the Program

This chapter summarizes projected future conditions in the lower San Joaquin River and Stanislaus River basins if the Program is not implemented. The purposes of this projection are to formulate Program objectives and direct the areas where Program elements would be developed.

Operation of New Melones Reservoir

Reclamation has historically met the terms and conditions of water right permits for operation of the New Melones Project, as required by SWRCB, and is committed to meet these terms and conditions in the future.

Reclamation has initiated revision of New Melones operations to incorporate new and changing information, and results of actions taken to reduce reliance on New Melones releases to meet existing water quality standards. Until a revised plan is developed, operation of New Melones Reservoir will be under the guidelines described in the IPO and SJRA to meet flow and water quality objectives in the lower San Joaquin River and Stanislaus River basins.

Future changes in State regulations

SWRCB performs periodic reviews of the Bay-Delta Plan, but currently no significant changes in standards are indicated. However, two current major undertakings of the Central Valley Regional Water Quality Control Board (CVRWQCB) may have positive influences on the Program: (1) short-term Irrigation Land Conditional Waivers (Conditional Waivers) to enforce control over agricultural discharges in quantity and quality, and (2) development and implementation of standards and allocation of total maximum daily load (TMDL) for various constituents. It is anticipated that these regulatory changes would encourage many locally initiated improvements, ultimately improving San Joaquin River water quality.

Irrigation Lands Waivers

CVRWQCB regulates discharges of waste primarily through issuance of Waste Discharge Requirements (WDR) and National Pollutant Discharge Elimination System (NPDES) permits. The California Water Code (CWC) states that anyone discharging or proposing to discharge waste that could affect water quality must file a report of waste discharge; discharged waste can include irrigation return flows and storm water runoff from agricultural lands. After receipt of the waste

discharge report, CVRWQCB has a statutory obligation to prescribe WDRs or an NPDES Permit Order. NPDES permits are issued for point source and municipal stormwater discharges, but irrigation return flows and stormwater discharges from irrigated lands are currently exempted from the NPDES permit program.

The requirement for WDRs may be waived by CVRWQCB for a specific discharge or type of discharge when such a waiver is not against the public interest. Although waivers are always conditional, historical applications had few conditions. In general, historical waivers required that discharges not cause violations of water quality objectives, and not require water quality monitoring.

In 1999, Senate Bill (SB) 390 was adopted and changed the section of the CWC authorizing waivers of WDRs. As a result of the changes, all waivers in place on January 1, 2000, would sunset January 1, 2003, if CVRWQCB did not readopt them. After a series of program development efforts, public hearings, and legal proceedings, CVRWQCB on August 5, 2005, issued its latest amendment to Conditional Waivers, Resolution No. R-5-2005-0107, to clarify conditions associated with property investigations subject to Conditional Waivers.

Three options exist for growers to avoid polluting rivers, streams, and creeks with pesticides, fertilizers, sediment, and other pollutants: (1) join a coalition group and apply for a group waiver for a regional approach, (2) apply for an individual discharger waiver, or (3) submit a complete application for a permit. The purpose of the Irrigated Lands Conditional Waivers is to provide an interim program until a 10-year implementation program can be developed for owners and operators of irrigated lands. This program will enable CVRWQCB to track progress in reducing the amount of waste discharged from irrigated lands to waters of the State and measure the effectiveness of management practices implemented to meet the goal of compliance with water quality objectives within 10 years. In addition, it would allow CVRWQCB to collect information that was not previously available to the public concerning specific locations, specific causes, specific types of waste, and specific management practices that mitigate impairments and improve and protect water quality. Coalition groups and individual growers should review the data available for their watershed, develop monitoring plans, and prioritize their efforts to address known problems or pollutants of concern, such as pesticides or nutrients.

Recently passed SB 923 authorizes payment of fees for Conditional Waivers to fund staff who will implement this program. The State Water Board is authorized to collect \$1.9 million annually; the fee schedule is currently being developed.

State Water Resources Control Board Total Maximum Daily Load Standards

The Federal Clean Water Act (CWA) contains two strategies for managing water quality: (1) a technology-based approach to maintain a minimum level of

pollutant management using the best available technology, and (2) water-quality-based approach to set limitations on the amount of pollution to which water can be exposed without adversely affecting the beneficial uses of the water.

Section 303(d) of the CWA bridges these two strategies. Section 303(d) requires that the states make a list of waters that are not attaining standards after the technology-based limits are put into place. For waters on this list (and where the United States Environmental Protection Agency (USEPA) administrator deems they are appropriate), the states are to develop TMDLs. A TMDL must account for all sources of pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (Federally permitted discharges) and contributions from nonpoint sources. USEPA is required to review and approve the list of impaired waters and each TMDL. If USEPA cannot approve the list or a TMDL, USEPA is required to establish TMDLs for the State.

In California, SWRCB has interpreted State law (Porter-Cologne Water Quality Control Act, California Water Code Section 13000 et. seq.) to require that implementation be addressed when TMDLs are incorporated into regional water quality control plans. The Porter-Cologne Act requires each Regional Water Quality Control Board to formulate and adopt water quality control plans for all areas within its region. It also requires that a program of implementation be developed that describes how water quality standards will be attained. TMDLs can be developed as a component of an implementation program (thus triggering the need to describe implementation features) or alternatively as a Water Quality Standard. When the TMDL is established as a standard, the implementation program must be designed to implement the TMDL. Typically, a revision to the implementation program is needed whenever a new standard is adopted.

Technical issues and the number of combinable pollutants affect the exact number of TMDLs that will be necessary to address the State's water quality problems. Some multiple pollutants can be addressed in a single TMDL, or multiple water bodies in a watershed may be addressed in a single TMDL project. Based on the current 303(d) list, SWRCB estimates that a total of over 400 TMDLs are needed for over 1,883 combinations of water body and pollutants. Currently, over 120 TMDLs are under development; many address multiple pollutants. Schedules have been developed for establishing all required TMDLs over a 13-year period.

SWRCB issued TMDL standards for selenium in 2004. In November 2005, SWRCB issued two resolutions approving and adopting amendments for the Basin Plan to: (1) incorporate a TMDL in the Sacramento River and San Joaquin River basins to control factors contributing to DO impairment in the Stockton Deep Water Ship Channel (DWSC), and (2) incorporate a TMDL to

control salt and boron discharges into the lower San Joaquin River. SWRCB authorizes its executive director to submit the amendment, as approved, and the administrative record for this action to the Office of Administrative Law, and to USEPA for approval.

Local Efforts

San Joaquin River Water Quality Management Group

Recognizing that a load-based solution was practically limited and potentially counterproductive, a number of stakeholders interested in developing a feasible and integrated solution to lower San Joaquin River water quality problems began to meet, and then formed the SJRWQMG.

The SJRWQMG is an informal group of stakeholders meeting to develop cooperative solutions to achieve water quality objectives targeted by the TMDLs. The participants¹ in SJRWQMG considered that complete solutions to both salinity/boron and DO problems are not readily available by approaching the problem through a load-reduction strategy alone because the San Joaquin River has been extensively modified, and CVRWQCB does not have authority to regulate flow (a jurisdiction under SWRCB), or require mitigation for facilities constructed and maintained by the Federal government such as the DWSC. On the other hand, participants in SJRWQMG have tools, management strategies, and assets that can affect water quality in the San Joaquin River. These tools and assets include loading reductions but also other alternatives that CVRWQCB has no ability to implement or regulate.

On August 30, 2005, SJRWQMG prepared Summary Recommendations of the San Joaquin River Water Quality Management Group for Meeting the Water Quality Objectives for Salinity Measured at Vernalis and Dissolved Oxygen in the Stockton Deep Water Ship Channel to seek support for the recommendations. The purpose of this paper is to summarize the work of SJRWQMG from May 2004 to June 2005. The ideas, information and concepts contained in this paper will be used to assist policymakers in deciding what actions will be implemented to meet water quality objectives in the San Joaquin River, specifically the salinity objective near Vernalis and the DO objective in the DWSC. Once agreement among policymakers has been reached regarding which action(s) will be taken to meet the objectives, it is anticipated that an agreement and appropriate environmental review will occur. It is expected that

¹ Participants in SJRWQMG include: Reclamation, Department of Water Resources, Central California Irrigation District, Friant Water Users Authority, Grassland Water District, James Irrigation District, Merced Irrigation District, Modesto Irrigation District, Oakdale Irrigation District, San Luis Canal Company, Exchange Contractor, San Joaquin County and Delta Water Quality Coalition, San Joaquin County Resources Conservation District, San Joaquin River Exchange Contractors Water Authority, San Joaquin Valley Drainage Authority, San Joaquin River Group, San Luis and Delta Mendota Water Authority, South San Joaquin Irrigation District, South Delta Water Agency, State Water Contractors, Stockton East Water District, Tranquility Irrigation District, Turlock Irrigation District, Venice Island Reclamation District 2023, California Farm Bureau, and Western Growers.

the recommendations of SJRWQMG will be used by Reclamation and DWR to help meet the requirements of House of Representatives 2828 and SB 1155.

SJRWQMG evaluated many flow and load management measures seeking to achieve salinity and DO objectives. SJRWQMG's summary recommendations for salinity and DO are described below.

1. Fully implement the West Side Regional Drainage Plan.
2. Further evaluate and pursue managed wetland drainage management actions to mitigate impacts of February through April drainage releases.
3. Develop a real-time water quality management coordination group involving lower San Joaquin River tributaries and drainers and DWR to coordinate reservoir releases and operation of the SWP to realize opportunities to improve water quality and increase the utility of stored water releases.
4. Pursue additional use of the Head of Old River Barrier to augment flows in the lower San Joaquin River and the DWSC, consistent with the need to maintain adequate in-Delta water quality, water levels, and fishery protection.
5. Support continued implementation of the City of Stockton's ammonia removal project at the Stockton Wastewater Treatment Plant.
6. Install a demonstration aeration project in the DWSC and continue recent upstream monitoring efforts to understand DO load-producing discharges.
7. Evaluate additional actions necessary for DO compliance at the DWSC following implementation and analysis of actions 1 through 5.
8. Establish a forum to evaluate ongoing changes in the water quality baseline and suggest further management actions to continue progress on water quality improvement.

Table 3-1 shows the actions, funding needs, and sources recommended by SJRWQMG.

Key aspects of the proposed recommendations are proceeding under separate planning functions, and environmental review, including SDIP and the West Side Regional Drainage Plan. These planning efforts are expected to be complete by summer 2006.

Table 3-1. Actions, Funding Needs, and Sources Recommended by SJRWQMG

Recommendation	Funding Needed	Recommended Source
Implementation of Drainage Plan	\$86 M, capital \$3-5 M annual operations	Federal/State bond/local
Managed Wetlands Actions	\$250,000 initial studies	Federal
Real -Time Operations	Existing staff/stakeholders	All participants
Head Old River Barrier Operations	Existing funding/staff	Local
Stockton Wastewater Treatment Plant	Funded	State
DO Aerator	Funded capital, \$200,000 operations	CALFED – capital; stakeholders agreement for operations
Continued DO Evaluation	Unknown/nominal	CVRWQCB/stakeholders
Lower River Forum	Nominal	Agencies/stakeholders

Key:

DO = Dissolved Oxygen

CVRWQCB = Central Valley Regional Water Quality Control Board

SJRWQMG = San Joaquin River Water Quality Management Group

These actions require joint responsibility from local, State and Federal agencies in order to be successful. Implementing the recommendations and any additional actions will require coordination among the agencies involved, hence formation of the Coordinating Agencies.

The mission of the Coordinating Agencies is to coordinate individual actions to collectively improve water quality on the lower San Joaquin River. The group consists of various agencies that either employ specific actions to improve water quality on the San Joaquin River or are able to assist in achieving those actions. DWR will lead and assist the Coordinating Agencies in implementing specific actions. These actions include but are not limited to those identified by the SJRWQMG. The Coordinating Agencies also will assist SJRWQMG in identifying and implementing actions that will achieve long-term water quality improvement.

Chapter 4

Program Development

As described in Chapter 1, the focus of this Program is to provide greater flexibility in meeting existing water quality standards and objectives for which the CVP has responsibility in order to reduce the demand on water from New Melones Reservoir used for those purposes.

Consistent with this focus (as stated in Chapter 1), objectives of the Program include the following:

- Reduce reliance on releases from New Melones Reservoir for meeting water quality and fishery flow requirements in the San Joaquin River near Vernalis so as to increase water deliveries to CVP contractors.
- Improve water quality conditions in the San Joaquin River above Vernalis.

Program Strategy

Program elements for achieving the above objectives can be developed from three strategies that address water quantity, water quality, and operational accuracy:

- Reduce the quantity and improve the timing of salinity discharges to the San Joaquin River above Vernalis.
- Provide alternative sources of water for flows in the San Joaquin River near Vernalis.
- Improve accuracy of New Melones operation and planning efforts.

Program Elements

Salinity Discharge Reduction and Improvement

- ✓ West Side Regional Drainage Plan
- ✓ Grassland Bypass Project
- ✓ Wetlands Best Management Practices Plan

Alternative Sources for Water Flows

- ✓ Delta-Mendota Canal Recirculation
- Water Acquisition from Willing Sellers

Improvements to Operations and Planning Efforts

- ✓ New Melones Revised Plan of Operation
- ✓ CALSIM II Improvement for Planning Efforts
- ✓ Forecast Model for CVP Allocation
- ✓ Flow and Water Quality Data Collection
- Level-of-Certainty Analysis for Meeting San Joaquin Basin Standards

Reclamation is currently implementing most of these elements, as indicated by check sign (✓).

Program Elements

The identified Program elements are presented in each of the three Program strategies described above. Program elements and associated focus and priority will be further investigated, refined, and augmented through public input and stakeholder communications in future Program efforts.

Reduce the Quantity and Improve the Timing of Salinity Discharges to the San Joaquin River above Vernalis

Due to the aforementioned changes, and pending changes in State regulations for water quality management in the San Joaquin River basin, many local and State-regulated efforts are being implemented or will be implemented in the future to improve overall water quality conditions in the San Joaquin River system, providing opportunities to reduce the requirement of New Melones Reservoir releases for San Joaquin River water quality management.

West Side Regional Drainage Plan

The West Side Regional Drainage Plan is an integrated plan to reduce and eliminate high salinity irrigation drainage from the Grassland Drainage Area (about 100,000 acres) through the following actions: (1) source control/efficient water management techniques, (2) recirculation of tailwater on primary irrigation lands, (3) collection and reuse of tile drains, (4) interception of groundwater, and (5) treatment and disposal of remaining drainage water. Based on findings in the 2005 Summary Recommendations of the San Joaquin River Water Quality Management Group for Meeting the Water Quality Objectives for Salinity Measured at Vernalis and Dissolved Oxygen in the Stockton Deep Water Ship Channel, prepared by SJRWQMG, full implementation of this plan accompanied with DMC recirculation will assure compliance with salinity standards for the San Joaquin River near Vernalis and reduce New Melones releases for water quality. The estimated cost for implementing this plan from 2005 through 2010 is \$86.5 million.

Grassland Bypass Project

In 1997, Reclamation and the San Luis and Delta-Mendota Water Authority (SLDMWA) began implementing the Grassland Bypass Project. Using the Grassland Bypass Channel and a segment of the San Luis Drain, the objective of this project is to remove agricultural drainage water from wetland water supply channels of wildlife refuges and wetlands in the Grassland Drainage Area. This project also facilitates drainage management that maintains the viability of agriculture in the Grassland Drainage Area and promotes continuous improvement of water quality in the San Joaquin River. Reclamation completed the Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) and issued a Record of Decision in 2001.

Since implementation of this project, all discharges of drainage water from the Grassland Drainage Area into wetlands and refuges have been eliminated, and the total discharge volume from the drainage area was reduced by 46 percent. Selenium and salt loads discharged from the Grassland Drainage Area were reduced by 61 percent and 39 percent, respectively. Data collected in this project were reviewed by staff from USFWS, CVRWQCB, CDFG, and USEPA, and made available to the public through the San Francisco Estuary Institute. Reclamation and SLDMWA will continue project implementation and periodic progress reports.

Wetlands Best Management Practices Plan

The Act directs the Secretary to develop and implement a best management practices (BMP) plan to reduce water quality impacts of discharges from managed wetlands that receive water from the Federal Government and discharge salt and other constituents into the San Joaquin River. As a result, USFWS, CDFG, and the Grassland Resource Conservation District (GRCD), in coordination with Reclamation are developing a BMP Plan to reduce the impact of the discharges from managed wetlands into the San Joaquin River. For purposes of this BMP Plan, BMPs are defined as programs, practices, or uses of devices that allow a reduction in the impact of salt or other constituents from discharges into the San Joaquin River while preserving the significant natural resources values associated with managed wetlands.

Modeling conducted by SJRWQMG has indicated that changes in return flows from managed wetlands between February to April during dry or critically dry water years are likely to result in the greatest benefits in minimizing use of New Melones to meet water quality standards in the San Joaquin River. Return flows from managed wetlands from February through April are associated with drawdown of refuge ponds, which are typically tied to hydrologic and weather conditions. The timing of drawdown is currently optimized through traditional wildlife management practices to maximize food sources for shorebirds and over-wintering waterfowl as well as to provide biological control of undesirable weeds.

The relative contributions of managed wetland discharges to San Joaquin River salinities have not been sufficiently evaluated, and therefore the strategy for implementing BMP will include development of new water quality monitoring and modeling. This information will then be used to develop a framework of BMP that is appropriate for implementation on managed wetlands.

Some of the core elements of the BMP Plan will be as follows:

- **Wetlands Recirculation** Implement increased water recirculation on managed wetlands, where feasible. This practice involves recycling water used on managed wetlands within the Grassland Ecological Area. Instead of draining water into the San Joaquin River, existing recirculation pumps and refuge conveyance systems are used to reuse

wetland drain water for both upland and wetland management purposes. This can serve a dual purpose of improving water use efficiency and also allowing for more options and flexibility regarding the amounts and timing of drain water released into the San Joaquin River.

- **Early Drawdown** Use early drawdown in February, where feasible, as a management tool in wetland areas that have grazing programs and alkali bush scrub type habitat. Some upland and riparian habitat management units can be winter-flooded and drawdown in February to simulate late winter floods.
- **Staged Drawdown** Use staged drawdown, where feasible, as a management tool to optimize water bird use of wetland habitats. Wetlands could be drawn down from late February through early May annually, under the following schedule: approximately one third of the wetland acreage drawn down in the period of late February to mid-March, one third drained in late March to early April, and the final third drawn down in mid-April to early May.
- **Control of Individual Wetland Management Units** Develop independent water control for wetland units to provide for greater management flexibility. This action involves the improvement or installation of water control structures to improve habitat, water use and distribution, and assist with other refuge objectives.
- **Participation within the San Joaquin Valley Westside Coalition (Coalition)** The managed wetland entities [USFWS, CDFG and the Grassland Water District (GWD)] have joined the Coalition which has secured a Conditional Waiver from CVRWQCB. Under the Conditional Waiver, the Coalition must prepare and implement technical reports to monitor surface water; evaluate, monitor and implement management practices that result in attainment of water quality objectives; and, if directed by CVRWQCB, implement additional measures to protect the quality of waters of the State within the Central Valley Region.

CDFG, in conjunction with GWD, USFWS, Reclamation, and DWR, is using State Proposition 50 funding, along with Federal, State and local funding, to conduct a three-year study to evaluate the effects of modifying traditional drawdown regimes at managed wetlands in the San Joaquin Valley. Water quality and flow monitoring will occur within wetland complexes to develop relationships between ambient wetland salinity and discharge salinity. Habitat assessment methodologies will be applied to provide a quantitative measure of the biological impacts of real-time water quality management implementation. This study will focus on three potential water management practices:

- Releasing wetland water later than usual (April or May) to be released in conjunction with VAMP flows. This would require evaluating the amount of additional water needed to maintain the marsh at its optimum level until the date of release.
- Releasing wetland water earlier than usual (in January and February) to reduce the volume of salt load in more critical months such as March.
- Releasing wetland water over a longer period of time, e.g., 3 months or more. This would reduce the total salt load in critical months.

This study will provide critical information on the benefits and impacts of modifying drawdown regimes at managed wetlands and will be instrumental in developing appropriate BMP for managed wetlands to address water quality in the San Joaquin River.

While some identified BMP are already basic elements of good wetland management, others may require determination of their effectiveness and feasibility, or may not be appropriate or possible to implement, due to legal, environmental, or economic constraints. BMP to be included in the BMP Plan that will require further investigation will include storage of wetland drainage, and flushing of wetlands using available flood flows. Funding needs and sources for the proposed BMP has not yet been identified. The draft BMP Plan is currently being finalized by USFWS, CDFG, and GRCD.

Provide Alternative Sources of Water for Flows in the San Joaquin River near Vernalis

Increased flow in the San Joaquin River near Vernalis could reduce reliance on releases from New Melones Reservoir to maintain flow and/or water quality objectives set forth in D-1641.

Delta-Mendota Canal Recirculation

The Act authorizes Reclamation to conduct feasibility studies to evaluate, and if feasible, implement recirculation of export water to reduce salinity and improve DO in the San Joaquin River. The Act also directs the Secretary to incorporate into the Program a recirculation program to provide flow, reduce salinity concentrations in the San Joaquin River, and reduce reliance on New Melones Reservoir for meeting water quality and fishery flow objectives through the use of excess capacity in export pumping and conveyance facilities. The concept of recirculation is to convey water from Tracy Pumping Plant via the DMC, where a portion of the water can flow through the Newman Wasteway and be diverted to the San Joaquin River near its confluence with the Merced River.

Using recirculation to meet flow and water quality objectives for the San Joaquin River near Vernalis was evaluated by DWR in a 1995 Appraisal Study by Reclamation and a 1997 Operation Study for the Bay-Delta hearing. Per D-1641, Reclamation completed a revised, appraisal-level DMC Recirculation

Study in 2003 to perform preliminary hydrologic and water quality evaluations. Preliminary findings from the study indicate that recirculation can improve water quality and flow in the San Joaquin River below the Newman Wasteway; however, using recirculated water from the Delta in lieu of releases from eastside tributary streams, including the Stanislaus River, would reduce water quality of the San Joaquin River near Vernalis. Studies conducted to evaluate the amount and timing of excess capacity in export pumping and conveyance facilities indicate limited available capacity in CVP facilities.

In August 2004, Reclamation and SLDMWA conducted a Recirculation Pilot Study through use of excess capacity in the SWP export pumping and conveyance facilities to evaluate the effects of recirculation through the Newman Wasteway. The pilot study consisted only of adding water to the San Joaquin River via the Newman Wasteway, and did not include reduced releases from New Melones Reservoir. The limited pilot study suggested that DMC recirculation through the Newman Wasteway shows potential for improving flow and water quality conditions in the San Joaquin River. However, the study also revealed some impacts that will need further investigation.

With the authority granted in the Act, and appropriations provided in fiscal year 2006, Reclamation is initiating a Federal feasibility study. The objective of the DMC Recirculation feasibility study is to determine whether recirculation of export water is the most effective and feasible method to reduce salinity and improve DO in the San Joaquin River, and to develop a program “to provide flow, reduce salinity concentrations in the San Joaquin river, and reduce the reliance on the New Melones Reservoir for meeting water quality and fishery flow objectives through the use of excess capacity in export pumping and conveyance facilities.”

Water Acquisition from Willing Sellers

The Act directs the Secretary to consider water acquisition from willing sellers of water from streams tributary to the San Joaquin River, or other sources; to provide flow, dilute discharges of salt or other constituents; and improve water quality in the San Joaquin River below the confluence of the Merced and San Joaquin rivers, and to reduce reliance on New Melones Reservoir for meeting water quality and flow objectives for the San Joaquin River near Vernalis.

Pursuant to the 1999 SJRA, Reclamation currently purchases water from OID/SSJID, Modesto Irrigation District/Turlock Irrigation District, and Merced Irrigation District for implementing VAMP, and Reclamation can make additional acquisitions based on conditions in the river. The current water acquisition program will expire in 2010 with the end of SJRA.

Depending on hydrology and local demands, opportunities exist to buy additional surplus water in the San Joaquin system from water right holders such as San Joaquin River Exchange Contractors, OID/SSJID, Modesto Irrigation District/Turlock Irrigation District, and Merced Irrigation District.

Subject to appropriations, and willing sellers, the water acquisition program could be expanded to offset reductions in New Melones releases specifically for Vernalis flow objectives and water quality standards.

Improve Accuracy of New Melones Operations and Planning Efforts

Reclamation has initiated a revised plan to improve New Melons operations. In addition, Reclamation uses various tools, including computer models, for long-term CVP planning efforts and forecasts for real-time operations. Improvements in these analytical tools could benefit New Melones Reservoir operation.

An integrated analysis on uncertainties associated with Reclamation’s long-term sustainability for meeting existing water quality standards in the Program Area will be conducted to guide Reclamation’s coordinated management approach.

New Melones Revised Plan of Operation

The Act directs the Secretary to update the New Melones operating plan to take into account actions described in the Act that are designed to reduce reliance on New Melones for meeting water quality and fishery flow objectives, and to ensure that actions to enhance fisheries in the Stanislaus River are based on the best available science.

Reclamation has initiated a process to revise the operating plan for New Melones Reservoir. The Revised Plan of Operations (RPO) will replace the IPO, and will define how New Melones Reservoir will be operated to meet the RPO regulatory commitments and demands for use of CVP supplies from the Stanislaus River. The process also includes analyzing existing information and developing new information on salmonid habitat use within the Stanislaus River to propose a new instream flow standard.

Development of a long-term plan of operations for New Melones Reservoir will attempt to balance competing needs in the basin. In addition to existing and future demands, ongoing and newly authorized projects and programs are underway that may change regulatory requirements of the CVP and resulting demands on New Melones Reservoir. These activities include, but are not limited to, the following:

- DMC recirculation pilot and feasibility studies
- Water purchases and/or transfers to offset New Melones releases
- Refuge drainage BMP development
- Flow requirements in the 1987 CDFG Agreement for New Melones Reservoir
- Best available science for fisheries protection in the Stanislaus and lower San Joaquin rivers
- San Joaquin River Agreement update by 2010
- Improved hydrology and salinity information for the San Joaquin River system

The RPO process is designed to provide input to and incorporate results from the above actions, as well as any changes to the existing regulatory requirements.

Because many of the above activities will require several years to develop meaningful results, a near-term revision process will be initiated simultaneously to develop a Transitional Operation Plan. The Transitional Operation Plan could be implemented by 2007 and is intended to be in place for 8 to 10 years. Development of the Transitional Operation Plan will incorporate updated hydrologic and water quality information, and would be based on a specified level of risk for drought occurrence during the life of the Transitional Operation Plan.

CALSIM II Improvements for Planning Efforts

CALSIM II, jointly developed by Reclamation and DWR, is a statewide water resources planning model for the CVP and SWP and areas tributary to the Delta, including the San Joaquin River Basin. This model is the current standard modeling tool for long-term water resources planning, including studies conducted as part of the CALFED Program. Monthly simulated results are used by many models as inputs for subsequent subject-specific analyses. Improvements to this model for accuracy and representation in simulated operations are constantly made through various projects and programs. Improvements in model representation in the San Joaquin River Basin would directly benefit long-term planning efforts for operation of New Melones Reservoir.

In 2004, Reclamation completed a major stage of CALSIM II enhancement for the San Joaquin River Basin to improve operation and water quality simulations. This enhancement was accomplished through funding and efforts from various projects, including model development funding under the CVPIA 3406(g), Technical Assistance to the States, Eastside Integrated Resources Plan; the appraisal-level DMC Recirculation Study; and Upper San Joaquin River Basin Storage Investigation. Major accomplishments from these efforts are the redefinition of the land-use-based demands on the east side of the San Joaquin River Basin, improved simulation of eastside reservoir operation, and establishment of a disaggregated framework of water quality calculation for the San Joaquin River.

The focus of model improvements in the San Joaquin River Basin include improvements in simulated wetland operations, refinements of model representation in the San Joaquin River between Gravelly Ford and Mendota Pool, integration of groundwater interaction, and development of land-use-based demands and operations on the west side of the San Joaquin River Basin. Reclamation will continue these efforts in coordination with DWR.

Forecast Model for CVP Allocation

Reclamation's CVP allocation is based on reservoir storage conditions, forecasted hydrology from DWR, and contractor-facilitated delivery requests, including CVP allocation in the Stanislaus River Basin. Therefore, operation and allocation could be affected by the quality of forecasted hydrology, based on a DWR snow survey published in Bulletin 120.

DWR initiated efforts in improving the accuracy of forecasted hydrology in 2005. Reclamation will work with DWR closely to improve CVP allocation procedures and accuracy.

Flow and Water Quality Data Collection

Many organizations and programs are monitoring flow and water quality data in the San Joaquin Valley. Strategic placement of monitoring stations and long-term data collection will benefit forecasting and planning model development significantly. Real-time operation of New Melones Reservoir requires daily coordination with other agencies and districts. Availability and quality of real-time monitoring data are critical for improving operation accuracy.

Reclamation will coordinate with other monitoring agencies and entities to develop a data collection strategy and continue the existing practice of providing data to the Interagency Ecological Program for central storage and distribution.

Level-of-Certainty Analysis for Meeting San Joaquin Basin Standards

The Program needs to coordinate and integrate the program elements mentioned above into operation of New Melones Reservoir. Therefore, to reduce some of the inherent complexity into a manageable framework, a technical report will be produced to provide quantitative information necessary to refine program goals and to develop integrated alternatives. This technical report will be used as a foundation for coordinating with stakeholders and regulatory agencies to establish a common understanding of the challenges and uncertainties associated with meeting existing San Joaquin River water quality standards, and to establish a consistent approach for integrating various program elements. Key elements of the analysis will be as follows:

- **San Joaquin River Basin water supply hydrology** A description of the cyclic nature of the main river systems in the San Joaquin River Basin that includes an estimate of the return periods of historical drought periods for each of the subbasins. The severity of a drought influences the certainty of meeting water right standards. If a historical drought has a return period that is very severe, it may not be possible to meet all water right conditions. Or, if a severe drought period is chosen as the planning horizon to attempt to meet all standards, a very conservative plan of operations could be developed that holds as much water as possible to meet standards, but sacrifices other beneficial uses in non-drought periods. A tradeoff analysis of these issues will need to be included in the evaluation.

- **Water demand of the San Joaquin River Basin standards** This is a planning analysis using the best information available to illustrate the basic operations framework of the major water systems in the San Joaquin River Basin. Based on planning analysis results, a water demand gap analysis will be performed to illustrate the hydrologic conditions under which San Joaquin River Basin standards are met by the basic operations framework, and when additional water supplies would be necessary. Conditional water budget information will be performed to assess the magnitude, timing, and duration of potential shortfalls of water supplies necessary to fully meet existing San Joaquin River Basin standards. This information is critical for assessing potential programs and operation dynamics necessary to evaluate an integrated program to meet new standards on a sustained basis.
- **Conceptual discussion of water purchase influences to reservoir operations dynamics** Water purchases from willing sellers have secondary effects on reservoir operations in the San Joaquin River Basin. Water purchase programs generate available water supplies on a temporal basis by using groundwater substitution, crop fallowing, or enhanced reservoir storage releases. Each program has unique secondary effects on the temporal variation of water supplies in the San Joaquin River Basin that can affect the ability to meet water quality standards. This operational assessment is expected to outline a set of water purchase conditions to address mitigation of potential future secondary effects.

A more detailed scope of this activity, which includes a schedule and budget, will be prepared in 2006 and initiated in 2007 if funding is available.

Related Programs to Be Integrated

To enhance Reclamation's coordinated management approach; Reclamation will coordinate and implement the Program elements with a full understanding of and coordination with two major related programs: installation of permanent operable barriers under SDIP and the Eastside Integrated Resources Plan.

Installation of Permanent Barriers with Operable Gates in South Delta Area

The SDIP considered by Reclamation and DWR includes the installation of permanent barriers with operable gates, increasing permitted diversion rates to the Clifton Court Forebay, dredging channels in the South Delta, and extending agricultural diversions. The project was proposed to improve the water quality and protect fish in the South Delta and increase the reliability and amount of water deliveries to south-of-Delta water users. The proposed physical changes include replacement of seasonal rock barriers with four permanent barriers with operable gates. This would protect fish and improve water circulation and

levels in the South Delta. In total, these actions would improve water quality and give farmers improved access to irrigation water. Operation of these permanent barriers could improve the existing practice to ensure water quality for agricultural beneficial use in the South Delta, as required in D-1641. Operation of these permanent barriers also could be incorporated into DMC recirculation to reduce the level of operational limitations stemming from water quality concerns in the South Delta.

The Draft EIS/EIR for the SDIP was released on November 10, 2005; release of the draft initiates a formal public process. Proposed physical improvements to South Delta infrastructure will be considered during a 90-day review period. If it is decided to build the permanent barriers with operable gates, construction is expected to be complete in April 2009.

Eastside Integrated Resources Plan

Reclamation has initiated the Eastside Integrated Resources Plan to identify current and future CVP water supply gaps on the east side of the San Joaquin Valley, and to identify opportunities, strategies, and partnerships to close the gaps. This broader and long-range integrated plan was in its early development stage, focusing on stakeholder involvement and improving the planning model, CALSIM II. Through this process, CALSIM II improvements described above were made, and results indicated a need to adjust operations of New Melones Reservoir in response to updated hydrologic and water quality information. As a result, the Eastside Integrated Resource Management Plan has been paused until the New Melones Transitional Operation Plan is developed.

This page left blank intentionally.

Chapter 5

Program Implementation and Coordination

Balancing competing needs in the Stanislaus River Basin and water quality concerns in the San Joaquin River are longstanding issues in the San Joaquin Valley. To address these two issues, Reclamation has been working with the State, local agencies, and interested groups in developing and implementing activities that could facilitate additional CVP contract delivery from New Melones Reservoir.

Program Implementation

Implementing the Program to Meet Standards is a complex management challenge due to complicated interrelationships of water operations, regulatory requirements, and stakeholder interests. Reclamation is pursuing a coordinated management approach to develop and implement the Program.

The Program authorized by the Act provides opportunities for comprehensive and integrated management for funding, project development, and stakeholder involvement purposes. Currently identified Program elements include four items included in the Act (DMC recirculation, water acquisition, Wetlands BMP Plan, and New Melones RPO) and additional actions, projects, and programs. Besides these specified Program elements, Reclamation has identified additional Program elements and related programs to be incorporated. Reclamation anticipates further refinement of Program elements through continued public involvement and stakeholder communication. Figure 5-1 shows the current projected schedule of identified Program elements; this schedule is subject to further individual project development and funding availability.

Program Coordination

Reclamation is committed to continuing and improving public involvement and stakeholder communications as an integral part of Program development and implementation. It is anticipated that public and stakeholder involvement will enhance the effectiveness of this Program and result in early implementation of priority Program elements.

In an effort to ensure coordination with agencies and the interested public, the Program will be vetted through established CALFED processes. This will encourage and allow coordination with the State to meet requirements of the Act and will allow the largest number of stakeholders to comment.

Additionally, stakeholder comments received as part of other ongoing projects associated with the Program will be incorporated as appropriate.

Reclamation and other State and Federal agencies will coordinate and track the progress of program elements through the Joint Agency Task Force organized under SJRWQMG. This task force includes representatives of Reclamation, USFWS, NMFS, DWR, SWRCB, and CDFG. The mission of this Task Force is to coordinate individual actions or participating agencies that will collectively improve water quality on the lower San Joaquin River. These actions include, but are not limited to, those identified by SJRWQMG. Federal and State agencies also will work with SJRWQMG to identify and assist in implementing actions that will achieve long-term water quality improvement, and to monitor baseline changes affecting water quality improvement. Program status and accomplishments will be reported annually in the CALFED Program Annual Report.

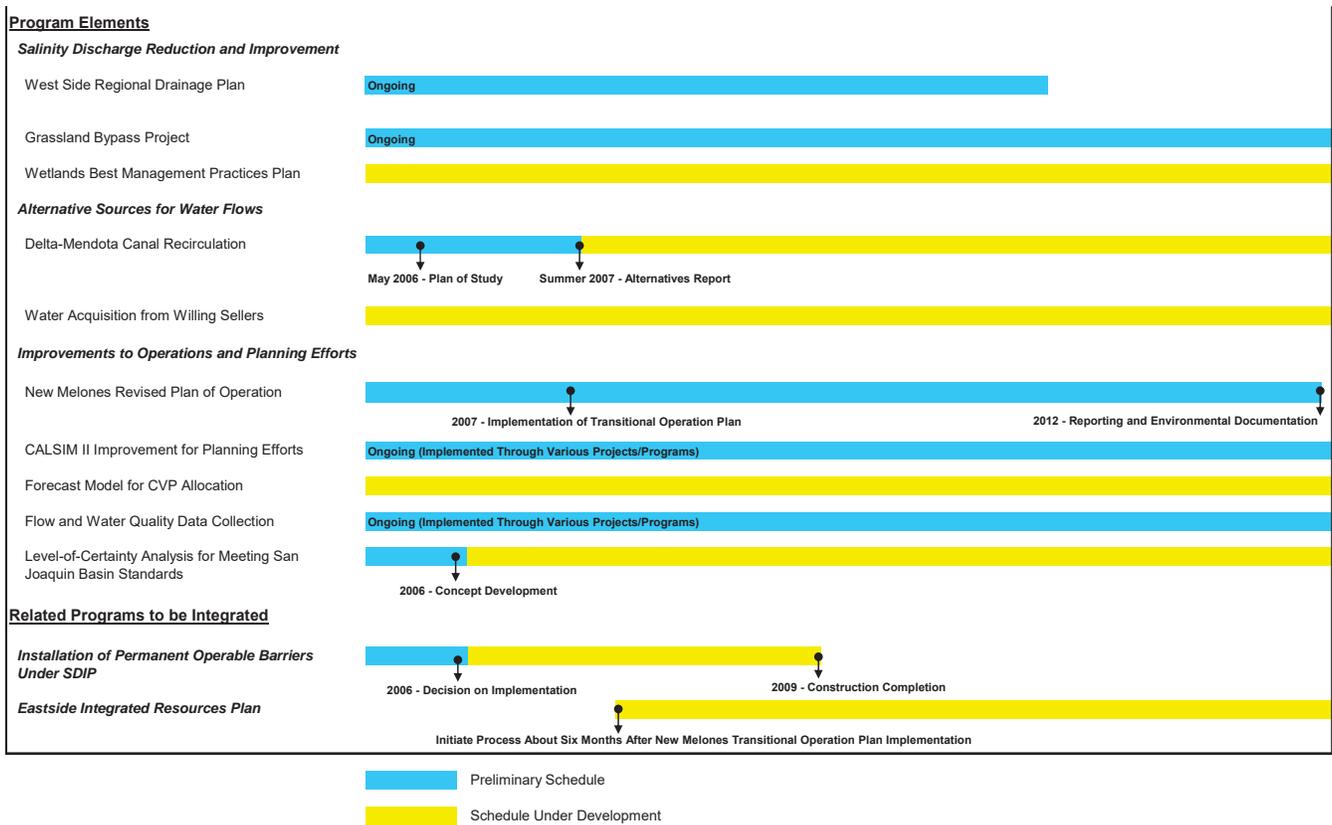


Figure 5-1. Program Element Schedule

This page left blank intentionally.