

# Reclamation's Salinity Management Plan

Revised 4/30/2008

## Actions to Address the Salinity and Boron Total Maximum Daily Load Issues For the Lower San Joaquin River

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## **Actions to Address the Salinity and Boron Total Maximum Daily Load Issues for the Lower San Joaquin River**

### **CURRENT ACTIONS**

The items listed below identify actions taken by Reclamation to provide flows to the San Joaquin River and reduce salt load in the Basin.

- **Providing Flows to the System**
  - New Melones Reservoir Operations
  - Water Acquisition
    - Water Acquisitions Program
    - EWA flows
- **Salt Load Reductions**
  - Grassland Bypass Project
  - Westside Regional Drainage Plan
  - Water Use Efficiency Grant Programs
    - Water Conservation Field Services Program
    - Water 2025 Program
    - CALFED Water Use Efficiency Program
- **Mitigation**
  - Develop Stakeholder interest in Real Time Management
    - Lead the effort to revitalize and develop the Real Time Management effort recommended by the San Joaquin River Water Quality Management Group (SJRWQMG)
    - Engage stakeholders in the development of monitoring and modeling work
    - Provide assistance to stakeholders in writing grant proposals for salinity management
    - Assist Wetlands in developing and implementing Best Management Plans
  - Participate in the work to establish a real time monitoring network
    - Develop a monitoring plan
    - Install and upgrade necessary stations
    - Develop a data management and storage strategy
  - Participate in the work to develop a forecast model for Real Time Management
    - Model development
    - Model calibration
    - Model refinement

### **POTENTIAL FUTURE ACTIONS**

Reclamation is currently involved in several planning studies and long-term projects that will have potential benefits in improving the water quality of the San Joaquin River Basin. Although the studies are underway, the potential outcome of these studies and projects will not be known for some time. Projects include the following:

- Delta Mendota Canal Recirculation
- New Melones Revised Plan of Operations
- Flow and Water Quality Data Collection

- San Luis Unit Drainage Features Re-Evaluation
- South Delta Improvements Project (SDIP)
- Flooded Islands Study
- San Joaquin River Restoration Project
- SJRWQMG

Both Reclamation and the Board have agreed to revise the MAA when any of the above actions are implemented.

### **RECLAMATION'S SALINITY MANAGEMENT PLAN**

This document identifies the practices and procedures which are the structure of the salinity management plan (Plan) for Reclamation's Mid-Pacific Region. The Plan describes the actions used for water quality management on the San Joaquin Basin for the control of salinity and boron using existing authority and appropriations. The most current modeling analyses performed on the Basin are consistent with the actual collected data and supports the positive benefits to water quality through the implementation of these actions.

The Plan will focus on current actions and proposed mitigation components. This Plan was developed in conjunction with the MAA between Reclamation and the Board to improve the salt and boron conditions on the Lower San Joaquin River. The Plan focuses on three major groups of actions taken by Reclamation:

1. Providing flows to the system
2. Reducing salt load to the river
3. Facilitating mitigation

### **FLOW ACTIONS**

#### ***New Melones Operations – Dilution Flows***

The Flood Control Act of December 1944 authorized construction of a dam to replace Melones Dam. The U.S. Army Corps of Engineers (Corps) was to build and operate this dam to help alleviate serious flooding problems along the Stanislaus and Lower San Joaquin Rivers. In the Flood Control Act of 1962 (P.L. 87-874), Congress reauthorized and expanded the project to a multi-purpose unit to be built by the Corps and operated by the Secretary of the Interior as part of the Central Valley Project (CVP), thus creating the New Melones Unit. The multi-purpose objectives of the Unit include flood control, irrigation, municipal and industrial water supply, power generation, fishery enhancement, water quality improvement, and recreation. Irrigation and storage facilities have been developed on the Stanislaus River both upstream and downstream from New Melones Dam.

The New Melones Interim Plan of Operation was developed as a joint effort between Reclamation and the Fish and Wildlife Service (FWS) in conjunction with the Stanislaus River Basin stakeholders. This process began in 1995 with a goal to develop a management plan with clear operating criteria for available water supplies in the Stanislaus Basin on a long-term basis. That effort was continued with a group of Stanislaus stakeholders in 1996; however, the focus shifted to an interim plan for 1997 and 1998 operations. During a stakeholder's meeting on January 29, 1997, a final interim plan of operation for the New Melones Reservoir was agreed upon in concept.

**Plan Elements:**

Congress authorized the construction and operation of New Melones Reservoir as a multi-purpose facility, which includes water quality. Water released from New Melones is of high quality and provides a large assimilative capacity when it reaches the confluence of the San Joaquin River. In terms of water management and water supply, releases from New Melones can improve salinity in the San Joaquin River at Vernalis.

New Melones Reservoir makes releases which provide multiple instream beneficial uses. When releases are made for non-consumptive uses, the majority of the release will reach the San Joaquin River at Vernalis. Releases are made for instream fishery benefits based on schedules requested by the California Department of Fish and Game (DFG), as well as the FWS. Releases may also be made to maintain the dissolved oxygen level in the Stanislaus River at Ripon. If these releases are not sufficient to fully meet the salinity standard at Vernalis, then additional releases will be made from New Melones until the salinity standard is satisfied. It is the total of the non-consumptive use release which provides the assimilative capacity at Vernalis and mitigates for increased salinity in the middle reaches of the San Joaquin River.

There are occasions when New Melones releases would not be accounted as a water quality dilution, most notably when New Melones initiates flood control releases and when the San Joaquin River flow is so high there is sufficient natural assimilative capacity in the system. These circumstances will generally occur in wetter years when other tributaries to the San Joaquin River are operating to maintain flood control pools or there are high side flows entering the San Joaquin River.

**Plan Effectiveness:**

The combination of land retirement, refuge water supply, and reduced salt loading from the Grasslands Bypass Project has altered the hydrology of the Basin and has improved the water quality of the San Joaquin River. New Melones Reservoir dilution flows provide the final action to ensure the water quality standard will be met.

***Water Acquisitions***

***Water Acquisitions Program***

Through the Central Valley Project Improvement Act (CVPIA), Congress identified the importance of the CVP in California's water resources picture, but made significant changes in the policies and administration of the project. A major feature of the CVPIA is that it requires acquisition of water for protecting, restoring, and enhancing fish and wildlife populations. To meet the needs under CVPIA, the Department of the Interior developed a Water Acquisitions Program (WAP), a joint effort by Reclamation and the FWS. CVPIA redefined the purposes of the CVP and identified several specific goals and objectives for the Interior to meet. These include:

- To protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California.
- To address impacts of the CVP on fish, wildlife, and associated habitats.
- To improve the operational flexibility of the CVP.
- To increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation.

- To contribute to the State of California’s interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.
- To achieve a reasonable balance among competing demands for use of CVP water, including the requirements of fish and wildlife, agricultural, municipal and industrial, and power contractors.

To achieve the CVPIA’s purposes and the identified goals and objectives, a large number of provisions were incorporated into the statute. These provisions involve water contracts, improved water management, restoration of anadromous fish populations, water supplies for State and Federal refuges, mitigation for other fish and wildlife impacted by the CVP, and retirement of drainage-impaired farm lands. The actions of the CVPIA produce a broad spectrum of benefits – including improved water quality through increased flows and assimilative capacity.

**Plan Elements:**

- Provide up to 800,000 acre-feet of CVP water annually to improve stream flows for salmon, steelhead, and other fish on the Sacramento, American, and Stanislaus Rivers and on Clear Creek.
- Implement the Vernalis Adaptive Management Program (VAMP). This experimental program involves the acquisition of water (as necessary) on the San Joaquin River tributaries to improve flows in the Delta and reductions in pumping at State and Federal facilities to reduce entrainment of juvenile salmon as they migrate to ocean waters.
- Acquire additional water for restoration of fish-friendly instream flows.
- Acquire firm annual water supplies for delivery to valley refuges and the Grasslands Resource Conservation District to meet the habitat needs of migratory waterfowl, shorebirds and other wetland-dependent wildlife.

**Plan Effectiveness:**

Since passage of the CVPIA, Reclamation and the FWS, with assistance from the State of California and the cooperation of many partners, have completed many of the necessary administrative requirements, conducted numerous studies and investigations, implemented hundreds of measures, and made significant progress toward achieving the goals and objectives established by the CVPIA. There are positive effects being observed in the Central Valley ecosystem, not only in the various species and habitat types, but also flow and water quality in the associated water bodies.

- VAMP was implemented. This experimental program involves acquisition of water (as necessary) on San Joaquin River tributaries to improve flows in the Delta and increase assimilative capacity in the river.
- Nearly 800,000 acre-feet of water have been acquired for restoration of fish-friendly instream flows. These flows provide additional assimilate capacity in the river to remove salt out of the Basin.
- Acquired over 375,000 acre-feet of annual water supplies for delivery to valley refuges and the Grassland Resource Conservation District to meet the habitat needs of migratory waterfowl, shorebirds and other wetland-dependent wildlife. These flows also provide a mechanism to remove salt out of the Basin.
- The combination of refuge water supply and reduced salt loading from the Grassland Bypass Project has altered the hydrology of the Basin and has improved the water quality of the San Joaquin River.

- In 2007, the WAP purchased 35,000 acre-feet of water from South San Joaquin Irrigation District, Merced Irrigation District, and Oakdale Irrigation District to increase instream flows for Delta smelt.

### ***Environmental Water Account***

The Environmental Water Account (EWA) is a program element being implemented under the CALFED Bay-Delta Program's water supply reliability and ecosystem restoration objectives. It is a cooperative management program between five federal (Reclamation, FWS, and the National Marine Fisheries Service) and state (California Departments of Water Resources and Fish and Game) agencies. The EWA's purpose is to provide protection to at-risk native fish species of the Bay-Delta estuary through environmentally beneficial changes in State Water Project (SWP)/CVP (Project) operations at no uncompensated water cost to the Projects' water users. This approach to fish protection involves temporary modifications of Project operations to benefit fish and the acquisition of alternative sources of Project water supply, called "EWA assets," which are used to augment instream and Delta outflows, modify Project water exports from the Delta to protect at-risk fish, and replace regular Project water supply lost due to export pumping reductions. EWA purchased assets released to the San Joaquin or its tributaries would add flows to the basin and increase assimilative capacity.

The August 28, 2000, CALFED Bay-Delta Program PEIS/EIR and ROD described an EWA as a 4-year program that could be extended by written agreement of the participating agencies. In September 2004, the five EWA agencies signed a Memorandum of Understanding that extended the EWA program until December 2007. The five EWA agencies now propose to extend the program through 2011 and have analyzed the potential effects of doing so in the October 2007 Draft Supplemental EIS/EIR to the EWA Final EIS/EIR.

### **Plan Elements:**

The EWA described in the CALFED ROD, consisted of two primary elements: facilitation of fish population recovery through assets (water) acquisition and management and use of the acquired assets to replace Project water deliveries (or supplies) interrupted by changes in Project operations. That is, the EWA program helps facilitate fish population recovery by reducing export pumping in the Delta when fish are most at risk. Important actions taken to benefit fish include:

- Reducing Delta exports
- Closing the Delta Cross Channel Gates beyond closures required without the EWA
- Increasing instream flows
- Augmenting Delta outflows

In addition to benefiting at-risk fish, some of the recommended actions would help increase flows and increase assimilative capacity in the Lower San Joaquin Basin.

### **Plan Effectiveness:**

The EWA provides an alternative way for conducting fishery management by taking an adaptive management approach rather than a prescriptive/regulatory approach. By providing water for at-risk native fish beyond existing regulatory requirements, it supports the ecosystem restoration goals laid out in the CALFED ROD. Although EWA assets are acquired from upstream of the Delta and the Project export service area south of the Delta, water purchased upstream of the Delta and released to the San Joaquin River could also improve water quality. Since EWA's inception in 2000, Reclamation has purchased 50,000 acre feet of water from the Merced Irrigation District that was released from Exchequer Reservoir to the Lower San Joaquin River. Depending on the season, water year type, and water quality condition of the San Joaquin, the value of this additional flow on improving water quality would vary.

## **SALT LOAD REDUCTION ACTIONS**

### ***Grassland Bypass Project***

The Grassland Bypass Project (GBP) is designed to improve water quality in the channels used to deliver water to wetland areas and the San Joaquin River. Prior to implementation of the GBP, drainage water from farms in the 97,000 acre Grassland Drainage Area (GDA) was discharged into the San Joaquin River through Salt Slough and other channels used to deliver water to wetland areas. This drainage water contains high concentrations of selenium, salts, boron, and other constituents that are harmful to wildlife.

The GBP is based upon an agreement between Reclamation and the San Luis and Delta-Mendota Water Authority (Authority) to use a 28-mile segment of the San Luis Drain. The Authority uses the San Luis Drain to convey agricultural subsurface drainage water from the GDA to the San Joaquin River via a six-mile segment of Mud Slough.

The Use Agreement between Reclamation and the Authority specifies the conditions for use of the San Luis Drain for the GBP and further specifies the maximum monthly and annual loads of selenium and salt that can be discharged project based on a Waste Discharge Requirement and the 2004 Basin Plan Amendment. The Use Agreement allows the Authority to use the San Luis Drain through December 31, 2009. The goal of the Use Agreement was to have zero discharge into the San Joaquin River by the end of 2009. The 2009 target date will not be met and the Authority is seeking a new use agreement.

The San Joaquin River Water Quality Improvement Project (SJRIP) is a key component developed and implemented by the Grassland Area Farmers in order to reduce discharges to the San Joaquin River and to meet regulatory requirements. SJRIP is a reuse project located within the GDA and is operated by Panoche Drainage District. The SJRIP collects tile drainage water from the GDA and reuses it to produce halophytic crops in order to concentrate drainage.

### **Plan Elements:**

- Remove GDA agricultural subsurface drainage water from the Grassland wetland supply channels.
- Establish monthly and annual salt and selenium load objectives that diminish to match the assimilative capacity of the San Joaquin River in 2010.
- Combine agricultural subsurface drainage flows within a single concrete-lined structure to allow effective monitoring of drainage flows.
- Establish a drainage entity to provide the framework necessary for responsible watershed management in the Grassland Basin.
- Implement the GBP monitoring program in Mud Slough, Salt Slough, and the Lower San Joaquin River for water quality, biological, and toxicity parameters.
- Publication of monthly data reports and annual synthesis reports.
- Develop and implement a drainage reuse project – SJRIP.

### **Plan Effectiveness:**

Since implementation of the GBP, discharges of drainage water from the GDA into wetlands and refuges have been eliminated. With about 4,000 acres of marginal land currently acting as a drainage water reuse area, the total discharge volume from the drainage area was reduced by 43

percent. Selenium and salt loads discharged from the GDA were reduced by 47 percent and 31 percent, respectively.

The GBP improves water quality in the wildlife refuges and wetlands; sustains the productivity of approximately 90,000 acres of farmland; and fosters cooperation between area farmers and regulatory agencies in drainage management reduction which reduces selenium and salt loading.

### ***Westside Regional Drainage Plan***

Drainage on the west side of the San Joaquin Valley has been studied for decades and enormous investments of time and money have been spent developing theoretical drainage reduction strategies. Although many strategies are known to be effective, few projects have been implemented. For over 50 years, both State and Federal planners have recognized the need for a special drainage plan for the region.

The Westside Regional Drainage Plan (WSRDP) was formulated by local stakeholders by integrating all consistent elements developed by government and local agencies and private partnerships. The GBP, as previously discussed, is a component of the WSRDP. The WSRDP began as an effort to reduce selenium discharges to the San Joaquin River. The success of the original effort has prompted a proposal to expand the WSRDP to go beyond regulatory requirements and eliminate selenium, boron, and salt discharges to the San Joaquin River, while maintaining productivity of agriculture lands in the solution area and enhancing water supplies for the region.

While Reclamation lacks control of many of the resources needed to be an active participant in the WSRDP, Reclamation provides annual funding to sustain the WSRDP. To date, Reclamation has provided over \$5.9 million to fund the work of the WSRDP and has requested an additional \$9.25 million to fund this work through 2009.

### **Plan Elements:**

The WSRDP relies on the following general plan elements to reduce and then eliminate high salinity irrigation drainage from these lands:

- Land Retirement.
- Reduction of drainage volumes to be managed through source control and efficient water management techniques.
- Recirculation and blending of tile water for use on primary irrigation lands.
- Installation of groundwater wells to lower groundwater in strategic locations in order to eliminate groundwater infiltration into tile drains.
- Treatment of remaining drainage water for irrigation reuse and production of marketable salt product.

### **Plan Effectiveness:**

The WSRDP has developed a schedule for simultaneous implementation of several actions to be completed by 2010. Since 1998, several actions have been implemented resulting in the capacity to reduce salt discharge by about 40,000 tons per year. Additional scheduled actions between 2006 and 2010 will provide additional capacity to permanently reduce a total of about 180,000 tons per year. When the WSRDP is fully implemented, salt load discharges will be reduced permanently and the annual discharge will only be influenced by local hydrologic conditions.

For example, during wet years, high volumes of local runoff and higher groundwater tables result in higher than average salt discharged to the San Joaquin River. Consequently, the capacity to reduce salt discharge under average conditions is a more relevant measurement of program progress than the actual mass of salt discharged during the project implementation period.

An analysis made by the SJRWQMG using the SANMAN model developed by Metropolitan Water District concluded that full implementation of the WSRDP will assure compliance with salinity objectives at Vernalis.

### ***Water Use Efficiency Grant Programs***

Reclamation funds several water conservation projects geared towards decreasing water demands in order to meet environmental, agricultural and growing urban needs. These projects are funded through different programs such as the Water Conservation Field Services Program (WCFSP), Water 2025, and CALFED.

### ***Water Conservation Field Services Program***

As a result of mandates detailed in the CVPIA of 1992, Reclamation's Mid-Pacific Region has placed a strong emphasis on water conservation. WCFSP is an incentive-based vehicle for Reclamation to assist contractors and others in meeting their water conservation planning obligations and implementing effective measures to optimize the use of limited water resources. The WCFSP provides cost-share funding to Reclamation contractors for the implementation of Best Management Practices (BMP) mandated by the CVPIA and identified in their water management plans.

Because of the competing water interests and the uncertainty of any future construction of large water projects, there is a need to manage and stretch the available existing water supplies to meet municipal and industrial, agricultural, recreational, and environmental needs. Education, flexibility, and demonstration of new technologies will be essential to meeting all the water needs.

### **Plan Elements:**

The WCFSP is designed to (1) encourage water conservation; (2) assist contractors with developing and implementing effective water management and conservation plans; (3) coordinate with State and other local conservation program efforts; and (4) generally foster improved water management on a regional, state-wide, and watershed basis. The four focus areas of the WCFSP include:

- Water management planning
- Conservation education
- Demonstration of innovative technologies
- Implementation of conservation measures

### **Plan Effectiveness:**

Reclamation's South Central California Area Office (SCCAO) has awarded WCFSP grants to contractors for projects such as canal lining and piping, irrigation scheduling, system delivery, system modernization, residential rebate programs and measurement. Since fiscal year 2000, Reclamation has awarded 146 WCFSP grants, totaling \$3.8 million to SCCAO water contractors whose tailwater drains into the Lower San Joaquin River. Including contractor contributions, the WCFSP has resulted in over \$7.8 million invested in water conservation projects. Through water

conservation and increasing the efficiency of water usage, agricultural drainage and salt loads are subsequently reduced to the river.

***Water 2025 Grants Program***

The program is focused on achieving the outcomes identified in Interior Secretary Gale Norton's *Water 2025: Preventing Crises and Conflict in the West*, particularly through water conservation and efficiency, water markets and collaboration, with an emphasis on projects that can be completed within 24 months and that reduce future water conflicts.

The *Water 2025* Challenge Grants encourage voluntary water banks and other market-based measures; promote the use of new technology for water conservation and efficiency; and remove institutional barriers in order to increase cooperation and collaboration among Federal, State, tribal, and private organizations.

Challenge Grant funding is provided on a cost-share basis to irrigation and water districts, western states, and other entities with water delivery authority for projects that stretch existing water supplies. The goal of *Water 2025* is to support realistic, cooperative approaches and tools that have the most likelihood of successfully addressing water challenges in basins where crisis and conflict are preventable. Challenge Grant projects focus on modernizing aging water delivery infrastructure, water marketing, and improving water use efficiency and conservation.

**Plan Elements:**

Principles of Water 2025 include:

- Recognize and respect State, tribal, and Federal water rights, contracts, and interstate compacts or decrees of the United States Supreme Court that allocate the right to use water.
- Maintain and modernize existing water facilities so they will continue to provide water and power.
- Enhance water conservation, use efficiency, and resource monitoring to allow existing water supplies to be used more effectively.
- Use collaborative approaches and market based transfers to minimize conflicts.
- Improve water treatment technology, such as desalination, to help increase water supply.
- Existing water supply infrastructure can provide additional benefits for existing and emerging needs for water.

**Plan Effectiveness:**

Between 2004 and 2006, the Water 2025 Challenge Grant program funded five projects in Reclamation's SCCAO. This region covers the water districts that drain into the Lower San Joaquin. Through water conservation and increasing the efficiency of water usage, agricultural drainage and salt loads are subsequently reduced to the river.

***CALFED Water Use Efficiency Program***

CALFED Bay-Delta Program was created in 1994 as a coordinated planning effort between 13 Federal and 12 State agencies to develop a long-term, comprehensive plan to restore the ecological health and to improve water management for the Bay-Delta System. The CALFED Water Use Efficiency (WUE) element is one of the cornerstones of CALFED's water management strategy. The goal of the WUE program is to develop a set of programs and assurances that contribute to CALFED goals and objectives; has broad stakeholder acceptance; fosters efficient water use; and helps support a sustainable economy and ecosystem.

**Plan Elements:**

The WUE element will be met by providing tools to local water suppliers and water users to improve water use efficiency. These tools include financial and technical assistance, research, and assurances. The WUE program is an incentives program to motivate water suppliers and water users to generate CALFED benefits by implementing conservation practices. Projects awarded grant funding for agricultural and urban water use efficiency shall demonstrate contributions toward any or all of the CALFED objectives by reducing irrecoverable water losses; attaining water quality benefits; and/or attaining environmental benefits.

**Plan Effectiveness:**

In FY 2006, the Mid-Pacific and Lower Colorado Regions of Reclamation competitively bid \$2.8 million in grants for water conservation projects that provide water supply reliability, water quality and ecosystem benefits to the Bay-Delta. Of the \$2.8 million, Reclamation awarded \$1,018,319 to SCCAO contractors (which include the San Luis Delta Mendota Water Authority, the City of Firebaugh, and Panoche Water District). This resulted in a \$2.96 million investment in Reclamation’s SCCAO region (which covers the Central Valley) for water conservation projects.

Both urban and agricultural projects were funded and all projects have measurable, state-wide benefits to the California Bay-Delta. Through water conservation and increasing the efficiency of water usage, agricultural drainage and salt loads are subsequently reduced to the river.

**MITIGATION**

A “Real Time Salinity Management” Program was proposed by the Board. Such a program would function through a cooperative effort where dischargers would hold back their discharges into the San Joaquin River during periods of no assimilative capacity. As the river gains assimilative capacity, dischargers will be able to release their discharges into the river. This effort will require an infrastructure to be developed where a management entity would function and operate. This management entity would monitor the river’s assimilative capacity and determine the appropriate time for drainers to discharge into the river.

***Develop Stakeholder Interest in Real Time Management***

The geographic scope of the Lower San Joaquin River Watershed, as defined in the salt and boron TMDL, drains approximately 2.9 million acres, which includes approximately 1.4 million acres of agricultural land use. The responsible parties identified in the TMDL (Reclamation, water districts, farmers, private and public wetlands and refuges) are all potential stakeholders and their involvement is crucial to the success of a Real Time Management Program (RTMP). Reclamation will lead the effort to develop stakeholder interest and involvement through the use of its resources, established relationships with public and private entities, programs, and expertise. Efforts will focus on the following:

- Lead the effort to revitalize the SJRWQMG and develop the group’s recommended RTMP.
- Engage stakeholders in the development of water quality monitoring network needed for the RTMP.
- Engage stakeholders in the development of a forecast model needed for the RTMP.
- Engage stakeholders in the development of a management framework needed for the RTMP.

- Provide assistance to stakeholders in writing grant proposals for salinity management projects.
- Assist wetlands managers in developing and implementing BMP plans.
- Make funding available for FWS managed wetlands to implement BMP plans.

***Real Time Management Program***

The SJRWQMG recommended development of a real-time water quality management coordination group involving Lower San Joaquin River tributaries, Lower San Joaquin River drainers, and the Department of Water Resources to coordinate reservoir releases with CVP/SWP operations to realize opportunities to improve water quality and increase the utility of stored water releases. Reclamation will lead the effort to revitalize the SJRWQMG and initiate the development of a viable real time management program to control salinity in the San Joaquin River Basin.

Currently, Reclamation has initiated an effort to lay the foundation needed to engage stakeholders to develop a Real Time Management Program. Reclamation is committed to funding a coordinator to help facilitate development of the stakeholder group and keep the group moving forward in developing a RTMP. At this time, Reclamation foresees the establishment of a steering committee to oversee the development of the RTMP and several sub-committees to develop key components necessary for the RTMP to be functional and effective. This effort will be carried out under Reclamation’s existing authority granted under P.L. 108-361 (PTMS).

***Participate in the Work to Establish a Real Time Monitoring Network***

In order for a RTMP to be feasible, a real time monitoring network (on the river) must be developed to feed current data into a forecast model. The model will serve as a decision-making tool to determine when and where assimilative capacity is available and notify drainers when they are able to discharge. The monitoring system and data system used for real time management must be robust, reliable, and well maintained to function properly and accurately. Reclamation will participate in this effort amongst stakeholders and draw upon its expertise and resources to help initiate, develop, and implement a suitable monitoring and data system to feed the necessary information into the forecast model used for real time management.

- Develop a monitoring plan
- Install and upgrade necessary stations
- Develop a data gathering, management, and storage strategy
- Evaluate the effectiveness of the monitoring plan in ongoing basis

***Participate in the Work to Develop a Forecast Model for Real Time Management***

The second technical component of an RTMP is a reliable and accurate forecast model that will serve as a decision-making tool. The forecast model must properly represent the condition of the river and its ability to assimilate the salt load from the Basin. The model should also be available for stakeholders and other agencies to perform their own modeling runs. Reclamation will participate in this effort amongst stakeholders and draw upon its expertise and resources to help initiate, develop, calibrate, and refine a suitable forecast model for the RTMP.

- Model development
- Model calibration
- Model refinement
- Evaluate the effectiveness of the forecast model in ongoing basis

### ***Wetlands BMP Plan***

The (FWS), DFG, and the Grassland Resource Conservation District (GRCD) in coordination with Reclamation are developing BMP plans to reduce the impact of discharges from managed wetlands into the San Joaquin River.

Modeling conducted by the SJRWQMG indicated that changes in return flows from managed wetlands between the months of February to April during dry or critical 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 at Vernalis.

Currently, a draft BMP plan has been developed and is awaiting FWS approval. Initial funding is in place to begin implementation of the BMP plan and to carry out the data collection effort. A small pilot study is under way with six paired sites to evaluate how the BMP measures would impact wetlands production and impacts to the San Joaquin River

### **Plan Elements:**

- Wetlands Recirculation - This practice involves recycling water used on managed wetlands within the Grassland Ecological Area (GEA).
- Early Drawdown - Use early drawdown in February, where feasible, as a management tool in wetland areas with grazing programs and alkali bush scrub type habitat.
- Staged Drawdown - Use staged drawdown, where feasible, as a management tool to optimize water bird use of wetland habitats.
- Control of Individual Wetland Management Units - Develop independent water control for wetland units to provide for greater management flexibility.
- Participation within the San Joaquin Valley Westside Coalition.

### **Mitigation Plan Effectiveness:**

Conceptually, a RTMP for the Lower San Joaquin River and the implementation of the Wetlands BMP plan could be very effective tools in removing high saline drainage out of the Basin without causing water quality violations, while minimizing reliance on New Melones to meet water quality standards. These elements are also consistent with the work and goals of the Central Valley Salinity Policy group.

### ***CUMULATIVE EFFECTIVENESS OF THE MANAGEMENT***

Since 1995, the year the water quality objective for salinity was adopted into the Water Quality Control Plan, the water quality objective never exceeded numeric targets at the Vernalis compliance point on the Lower San Joaquin River. Over ten years of monitoring data indicates that all beneficial uses in the river are supported and protected. From 1995 to the present, the San Joaquin River Basin has experienced the full range of water year types, and the water quality objective continues to be met. The work outlined in this plan and the eventual implementation of the wetlands BMP plan and stakeholder-developed RTMP will continue to bring about improvements in water quality for the Basin.

### ***MONITORING AND REPORTING***

Reclamation and Board staff will work together to develop a mutually agreeable monitoring and reporting plan to assess the progress made toward establishing a comprehensive, viable real-time water quality management program.

Board staff has proposed a phased approach to developing the plan. The first phase would lay out a two-year time line with specific tasks designed to obtain the necessary information, develop quantification methods, and develop a draft report evaluating the performance of the salt control plan elements. The second phase of the monitoring and reporting plan would be prescribed in a revised Management Agency Agreement.

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