Draft Compliance Monitoring and Evaluation Plan

In compliance with the "Management Agency Agreement between the Central Valley Regional Water Quality Control Board and the United States Bureau of Reclamation" executed on December 22, 2008

July 1, 2009

Public Review Draft, dated 5-15-09

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Abbreviations and Acronyms

Action Plan	Actions to Address the Salinity and Boron TMDL Issues for the Lower San Joaquin River
AF	acre-foot or acre-feet
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition
BMP	Best Management Practices
CALFED	CALFED Bay-Delta Program
CDEC	California Data Exchange Center
CDFG	California Department of Fish and Game
CVO	Central Valley Operations
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
DMC	Delta-Mendota Canal
DWR	California Department of Water Resources
Draft Plan	Draft Compliance and Monitoring Plan (this document)
EC	electrical conductivity
EWA	Environmental Water Account
GBP	Grassland Bypass Project
ID	irrigation district
Interior	U.S. Department of the Interior
LSJR	Lower San Joaquin River
MAA	Management Agency Agreement
µS/cm	micro Siemens per centimeter
QA	Quality Assurance
QC	Quality Control
Reclamation	Bureau of Reclamation
Regional Water Board	Central Valley Regional Water Quality Control Board
RTMP	Real Time Management Program
Service	U.S. Fish and Wildlife Service
SFEI	San Francisco Estuary Institute
SLDMWA	San Luis and Delta-Mendota Water Authority
TAF	thousand acre-feet
USGS	United States Geological Survey
VAMP	Vernalis Adaptive Management Plan
WAP	Water Acquisition Program
WQO	water quality objective
WRDP	Westside Regional Drainage Plan

Purpose

The purpose of the "Draft Compliance Monitoring and Evaluation Plan" (Draft Plan) is to meet one commitment of the initial monitoring, reporting, and assessment program agreed to in the "Management Agency Agreement between the Central Valley Regional Water Quality Control Board and the United States Bureau of Reclamation" (MAA) executed on December 22, 2008. The MAA describes the actions Reclamation will take to meet the obligations allocated to it by the Salt and Boron Total Maximum Daily Load for the lower San Joaquin River (Basin Plan Amendment[1]) as described in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition (Basin Plan). The MAA states:

> [The United States Bureau of] Reclamation will submit a *Draft Compliance Monitoring and Evaluation Plan* to the Regional Water Board. Where appropriate, the draft plan will propose the data and quantification methods used to evaluate the salt loads from Delta-Mendota Canal (DMC) operations and salinity offset credits to be applied to the various elements of Reclamation's Action Plan.
>
> Data will include monitoring locations, parameters monitored, data collection methods, and data quality control. Included with the proposed quantification methods for salt load offset credits for each element of Reclamation's Action Plan will be a description of the salt mitigation benefit of each element and a clear explanation of how the proposed quantification method accurately quantifies the salt load effect.

The MAA is an element of the Basin Plan Amendment, which states that the "MAA shall include provisions requiring the U.S. Bureau of Reclamation to a) Meet DMC load allocations; or b) Provide mitigation and/or dilution flows to create additional assimilative capacity for salt in the Lower San Joaquin River (LSJR) equivalent to salt loads in DMC supply water in excess of their allocation."

The MAA refers to Reclamation's Salinity Management Plan of Actions to Address the Salinity and Boron Total Maximum Daily Load Issues for the Lower San Joaquin River (Action Plan), which can be downloaded at

http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/vernalis_salt_boron/draft_maa_plan.pdf

The MAA can be downloaded at

http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/vernalis_salt_boron/signed_maa_22dec08.pdf.

[1] A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards and allocates pollutant loadings among point and nonpoint pollutant sources. A TMDL is the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background (40 CFR 130.2) with a margin of safety (CWA section 303(d)(1)(c)). (US EPA TMDL Guidance, 2005)

Organization of Plan

Regional Water Board staff proposed a phased approach to developing the Compliance Monitoring and Evaluation Plan. The first phase lasts two-years, and has specific tasks designed to obtain the necessary information, develop quantification methods, and develop a draft report evaluating the performance of the Action Plan elements. The second phase would be prescribed in a revised Management Agency Agreement.

The Action Plan describes all of the actions contemplated by Reclamation to comply with the MAA. Within the Action Plan, actions are divided into three major categories: Flow, Salt Load Reduction, and Mitigation. The Action Plan also described potential future actions. For each implementation action and for salinity imported through the DMC this plan includes a brief description and status, quantification methodology and example, data sources, and current schedule. The quantification methodology and data sources for the compliance point are also described. An overall accounting methodology is described in order to summarize the amount of DMC excess salinity loads that are offset by the individual Action Plan actions. The status of potential future actions and estimated benefits will be described as they become relevant to the Action Plan. Quarterly reports will follow the described format and methodology.

Every effort has been made to use publicly available data, as requested by the Regional Water Board. Where public data is not currently available, but internal data is available and will eventually become publicly accessible, data sources are described and compared.

A. Flow Actions

Reclamation has agreed to provide temporary mitigation and dilution flows to meet the Vernalis salinity and boron objectives, as documented in Water Rights Decision 1641. To meet this commitment, Reclamation has provided dilution flows from the New Melones Project and through purchases for the Vernalis Adaptive Management Program (VAMP). Flow actions include: dilution flows from New Melones Reservoir and water acquisitions.

1. New Melones Reservoir Operations – Dilution Flows

Description: Congress authorized the construction and operation of New Melones Reservoir as a multi-purpose facility, which includes water quality. Non-consumptive water releases from New Melones Reservoir is of high quality and provides a large dilution flows for salinity in the San Joaquin River. Releases are made for instream fishery benefits based on schedules requested by the California Department of Fish and Game (CDFG), 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 Reservoir 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.

The New Melones Reservoir Interim Plan of Operation was developed as a joint effort between Reclamation and the Fish and Wildlife Service (Service) 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.

Status: New Melones Reservoir currently provides dilution flows to meet the Vernalis water quality objectives (WQOs) and to offset salinity loads imported through the DMC. 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 over the past ten years. New Melones Reservoir dilution flows currently provide the final action to ensure the water quality standard will be met. Through Public Law 108-361, Reclamation is directed to develop and implement the Program to Meet Standards, in part to reduce the reliance on New Melones Reservoir to provide flows to meet water quality and fish objectives. Included in the Program to Meet Standards is the purchase of water from willing sellers and an update to the plan of operation for the New Melones Reservoir. The status of these efforts will be updated in quarterly and annual reports.

Quantification Methodology: For the quantification of dilution flow allocations, the Basin Plan Amendment uses the following equation[2] to calculate assimilative capacity. The Basin Plan Amendment specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow. However, this equation only applies if the dilution flow being quantified provides true dilution all the way to Vernalis on the San Joaquin River. In other words, dilution flows are those flows that enter the San Joaquin River and create assimilative capacity without interfering with the origin (Stanislaus River) subarea's ability to comply with its salinity allocation under the Basin Plan. To calculate the assimilative capacity created by Reclamation operations on the Stanislaus River, both the actual load of the river and the allocation for the river are calculated. The actual load is subtracted from the allocation to determine if assimilative capacity is available. Calculation of the actual load on a monthly basis is based on Appendix A to the Basin Plan Amendment, which uses a site-specific EC to TDS ratio:

$$L_{actual} = Q_{actual} * C_{actual} * 0.69 * 0.0013599$$

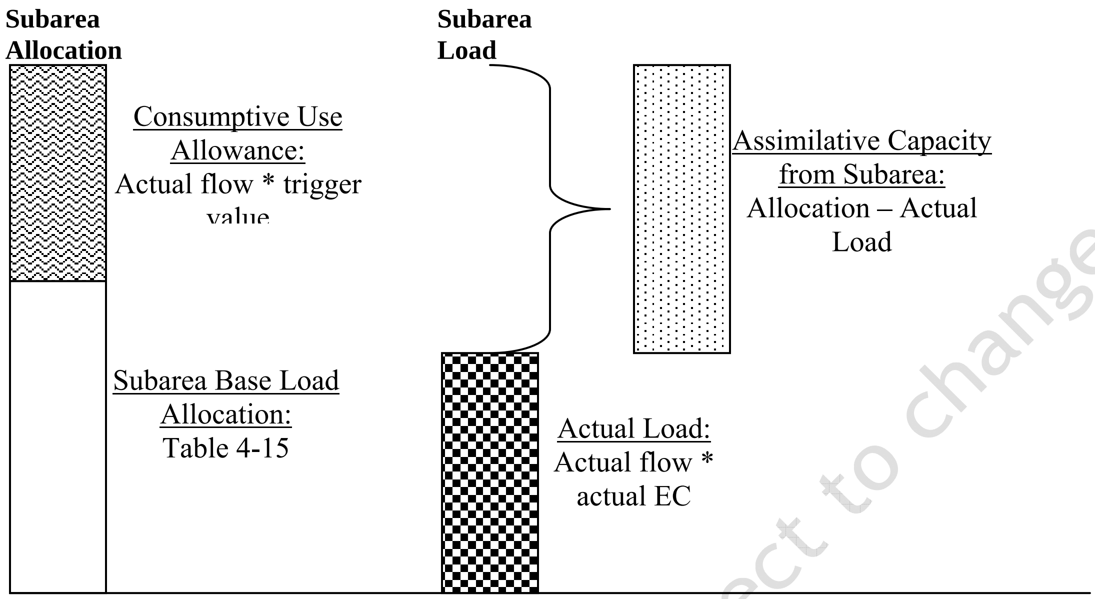
Where:

L_{actual}	=	actual load in tons of salt per month
Q_{actual}	=	actual monthly flow volume in acre-feet (AF)
C_{actual}	=	average monthly electrical conductivity in µS/cm
0.69	=	TDS:EC ratio specific to Stanislaus River (Appendix A to Basin Plan Amendment)
0.0013599	=	Salinity unit conversion, to convert Total Dissolved Solids (TDS) to tons

The allocation to the Stanislaus River subarea is a summation of its Load Allocation and its Consumptive Use Allowance. The load allocation is prescribed in Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003). The Consumptive Use Allowance is the product of the actual monthly flow volume and a trigger salinity value of 192 mg/L TDS. Figure 1 is an illustration of the available assimilative capacity for the subarea.

[2] Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition; Page IV-32.07, Table IV-4.4 Summary of Allocations and Credits.

Figure 1: Assimilative Capacity Calculation for the Stanislaus River Subarea



Data Collection and Quality Assurance/Quality Control (QA/QC): The United States Geological Survey's (USGS) maintains a stream gauging station at Ripon on the Stanislaus River, the closest station to its confluence with the San Joaquin River. The station is number 11303000 and is located at Latitude 37.7300°N, Longitude 121.1090°W. The publicly-available USGS flow data (Q_{actual}) is summarized monthly to calculate actual loads and Consumptive Use Allowances. Electrical conductivity (C_{actual}) is the monthly average of available daily measured EC (in µS/cm) at the Reclamation water quality station at Ripon on the Stanislaus River, available on the California Data Exchange Center (CDEC) database at http://www.cdec.water.ca.gov (RPN sensor number 100). EC is measured continuously (every 15 minutes) by a Hydrolab MS5 sonde which is co-located with Reclamation's Standard Operating Procedure for the sonde is attached as Appendix A. The station is calibrated from 0 to 2000 EC every month.

Example: As an example, the Table 1 lists data and calculations for 2008. Data for flow and salinity at Ripon, along with Base Load Allocations for the Stanislaus subarea are used to calculate actual loads and load allocations for the subarea. The difference between actual load and load allocation represents the monthly flow in thousand acre-feet (TAF) and monthly average EC in µS/cm for 2008, as demonstrated in Table 1.

Table 1: Assimilative Capacity from Stanislaus Subarea, tons

	Flow at RPN, TAF	EC at RPN, µS/cm	Subarea Base Load Allocation, tons (Table 4-15)		Subarea Allocation, tons	Actual Subarea Load, tons	Assimilative Capacity provided by Subarea, tons
September to March Standard, 1000 µS/cm							
Jan	22.7	119.0	884		6,849	2,539	4,310
Feb	17.5	146.9	713		5,319	2,419	2,900
Mar	48.2	107.2	542		13,191	4,849	8,342
April to August Standard, 700 µS/cm							
beg Apr	48.4	65.5	0		12,707	2,932	9,775
VAMP	58.0	63.3	0		15,232	3,448	11,784
end May	12.6	64.9	0		3,320	770	2,550
Jun	27.4	69.7	0		7,192	1,791	5,401
Jul	26.1	66.8	0		6,859	1,639	5,220
Aug	20.8	76.5	0		5,463	1,495	3,968
September to March Standard, 1000 µS/cm							
Sep	14.2	101.9	884		4,610	1,358	3,252
Oct	24.0	86.0	1,454		7,757	1,938	5,819
Nov	16.6	91.0	1,283		5,629	1,414	4,215
Dec	16.5	96.6	1,311		5,648	1,498	4,150

2. Water Acquisitions – Water Acquisitions Program

Description: The Central Valley Project Improvement Act of 1992 (CVPIA), signed into law on October 30, 1992, modified priorities for managing water resources of the Central Valley Project (CVP). CVPIA altered the management of the Central Valley Project to make fish and wildlife protection, restoration, and enhancement as project purposes having equal priority with agriculture, municipal and industrial, and power uses. To meet water acquisition needs under CVPIA, the U.S. Department of the Interior (Interior) has developed a Water Acquisition Program (WAP), a joint effort by Reclamation and the Service. The program's purpose is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the Interior's ability to meet regulatory water quality requirements.

Historically, the majority of WAP expenditures in the San Joaquin River basin have supported the provision of VAMP flows. VAMP flows are nonconsumptive releases primarily made to provide spring pulse flows for the salmon fishery, and are made in late April, early May and secondarily made to provide fall pulse flows. VAMP flows also coincidentally provide dilution capacity for salinity, as they meet the “dilution flow” requirements of the BPA.

Status: The WAP is an ongoing program authorized through the CVPIA. The VAMP Agreement is in the process of being extended to 2011. The State Water Resources Control Board is re-evaluating flow requirements for fishery protection on the San Joaquin River, which will establish the direction of post-VAMP fish flow obligations.

Quantification Methodology: For the quantification of dilution flow allocations, the Basin Plan Amendment prescribes the following equation[3] to calculate assimilative capacity. The Basin Plan Amendment specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:

$$A_{dil} = Q_{dil} * (C_{dil} - WQO) * EC{:}TDS * 0.0013599$$

Where:

A_{dil}	=	dilution flow allocation in tons of salt per month
Q_{dil}	=	dilution flow volume in acre-feet per month
C_{dil}	=	dilution flow electrical conductivity in µS/cm
WQO	=	salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in µS/cm
EC:TDS	=	TDS:EC ratio specific to River (Table A- 3 in Appendix A to Basin Plan Amendment) or 0.66 for the Merced River and 0.67 for the Tuolumne River
0.0013599	=	Salinity unit conversion, to convert TDS to tons

As discussed in Section A.1, Reclamation also examined the time periods when dilution flows occur to determine that the dilution flows are providing assimilative capacity to the San Joaquin River. Allocations were determined for the subareas where dilution flows originated, based on the actual flows measured closest to tributary confluences with the mainstem of the river and the base load allocations specified in Table 4-15 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003).

Data Collection and QA/QC: WAP purchases and releases are tracked by Reclamation's Water Acquisitions Group (MP-400) and will be reported as monthly averages along with the location the water is purchased from. WAP purchases are primarily made to support the VAMP program, and the release schedules, locations and volumes can be found in annual reports on the VAMP program at the San Joaquin River Group Authority's website: www.sjrg.org/technicalreport/ default.htm. Dilution flow salinity will be obtained from the Reclamation or CDEC-available EC monitoring station closest to the location of the WAP release point (or most downstream site). Appropriate station and QA/QC information for the station will be provided in subsequent data reports. Stanislaus River releases are not counted, as they are incorporated into the nonconsumptive releases quantified from New Melones and San Joaquin River Exchange Contractor releases are not counted, as they are released from the DMC, which are included in the imported supply load calculations. For the following example, salinity

[3] ibid

data from the Merced River at Stevinson (MST) is used and salinity data from the Tuolumne River at Modesto (MOD) is used, where hourly EC data is available on CDEC from monitoring stations maintained by the California Department of Water Resources.

Subarea allocation calculations are based on the Base Load Allocations and the Consumptive Use Allowance calculations for the Merced River and Tuolumne River subareas. Flow data was obtained from USGS stream gauging stations at Modesto for the Tuolumne River (11290000) and near Stevinson for the Merced River (11272500). Occasionally Merced River data is supplemented by the Department of Water Resources station near Stevinson (B05125, MST).

Example: The 2008 VAMP spring pulse flow period occurred from April 22 to May 22 and the fall pulse occurred in October. Water releases were made from the Merced River, the Tuolumne River, and through the DMC by the San Joaquin River Group Authority. Releases are timed to account for the lag time between tributary releases and arrival at Vernalis. Table 2 demonstrates the assimilative capacity provided from these releases, above the assimilative capacity needed by the region to meet load allocations for 2008.

Table 2: Assimilative Capacity from Water Acquisition Program flows, tons

	Merced River		**Tuolumne River**	
	VAMP	October	VAMP	October
Volume, TAF	38.1	12.5	15.28	0
Salinity (EC), µS/cm	80.3	87	59.0	136.6
Dilution Capacity, tons	21,212	10,243	8,925	0
Base Allocation, tons	0	2,627	0	1,505
Subarea Flow, TAF	56.6	17.2	65.9	15.2
Consumptive Use Allowance, tons	14,862	4,503	17,303	3,978
Subarea Allocation, tons	14,862	7,130	17,303	5,483
Subarea Flow, TAF	56.6	17.2	65.9	15.2
Salinity (EC), µS/cm	80.3	87	59.0	136.6
Actual Subarea Load, tons	4,083	1,360	3,513	1,886
Assimilative Capacity from Subarea, tons	10,779	5,770	13,790	3,597
Assimilative Capacity from WAP, tons	10,779	5,770	8,925	0

3. Water Acquisitions – Environmental Water Account

Description: 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, Service, 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 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.

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.

Status: The August 28, 2000, CALFED Bay-Delta Program Programmatic EIS/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. To date, no Record of Decision or Notice of Determination has been filed and the program has not been extended.

Quantification Methodology: For the quantification of dilution flow allocations, the Basin Plan prescribes the following equation[4] to calculate assimilative capacity. The Basin Plan specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:

$$A_{dil} = Q_{dil} * (C_{dil} - WQO) * EC{:}TDS * 0.0013599$$

Where:

A_{dil}	=	dilution flow allocation in tons of salt per month
Q_{dil}	=	dilution flow volume in acre-feet per month
C_{dil}	=	dilution flow electrical conductivity in µS/cm
WQO	=	salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in µS/cm
EC:TDS	=	TDS:EC ratio specific to River (Table A- 3 in Appendix A to Basin Plan Amendment)
0.0013599	=	Salinity unit conversion, to convert TDS to tons

Data Collection and QA/QC: EWA purchases and releases are tracked by Reclamation's Water Acquisitions Group (MP-400) and will be reported as monthly averages along with the location the water is purchased from. Dilution flow salinity will be obtained from the

[4] ibid

Reclamation or CDEC-available EC monitoring station closest to the location of the purchased water release point (or most downstream site). Appropriate station and QA/QC information for the station will be provided in subsequent data reports. This methodology is the same as is described in Section A-2.

Example: There were no EWA purchases made in 2008.

4. DMC Recirculation Pilot Study – Provision of Dilution Water

Description: The DMC Recirculation Project is one project Reclamation is studying to provide dilution water for salinity management. As part of the project studies, Reclamation conducted three pilot recirculation studies, in 2006, 2007, and 2008. The pilot studies circulate water from the Delta at Tracy and convey it down the DMC to the Newman Wasteway, where it is then conveyed to the lower San Joaquin River to provide salinity dilution.

Status: In the months of July, August, and September of 2008, water was conveyed to the San Joaquin River to pilot the DMC recirculation project and to evaluate water quality results.

Quantification Methodology: For the quantification of dilution flow allocations, the Basin Plan prescribes the following equation[5] to calculate assimilative capacity. The Basin Plan specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:

$$A_{dil} = Q_{dil} * (C_{dil} - WQO) * 0.8293$$

Where:

A_{dil}	=	dilution flow allocation in tons of salt per month
Q_{dil}	=	dilution flow volume in thousand acre-feet per month
C_{dil}	=	dilution flow electrical conductivity in µS/cm
WQO	=	salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in µS/cm
0.8293	=	Salinity unit conversion, to convert TDS to tons (using the same EC:TDS as is used for the DMC)

Data Collection and QA/QC: Recirculation flows are tracked by Reclamation's Central Valley Operations office and are reported as monthly volumes in the tables described in Section D of the Draft Plan (CVO Table 25). Recirculation flows were monitored for a number of water quality constituents in the Newman Wasteway as part of the pilot study. EC was measured continuously (every 15 minutes) using YSI 600 XL sondes in several locations following the same QA/QC protocols as the existing Reclamation sampling program for the DMC, with an accelerated calibration schedule (every 2 weeks).

[5] ibid

Example: In the 2008 pilot Recirculation study, flows were discharged from the Newman Wasteway into the San Joaquin River from July 28 through September 15. Technical difficulties in probe replacement resulted in less than full days of data during some of the study. Available data at milepost 8.16 in the Wasteway was averaged over days within each month while the study was in progress. Resulting load calculations for the 2008 pilot period is provided in Table 3.

Table 3: Dilution Flow Allocation of DMC Recirculation Pilot flows, tons

	Jul	Aug	Sep
Volume, TAF	1.0	13.4	7.1
Salinity at Newman Wasteway, EC, µS/cm	795	450	530
Dilution Capacity, tons	0	-3,901	-2,763

B. Salt Load Reduction Actions

The Grassland subarea is listed as a high priority for implementing load allocations (Table IV-6 of the BPA) due to the high unit area loading of salt to the LSJR. Much of the salt load in this area is due to the high salt loads brought into the Subarea through the DMC (quantified in Section D). The Grassland and Northwest subareas also provide the physical link between the majority of the DMC load and the lower San Joaquin River, as much of the load flows through this area (and some is concentrated through the use of the water) to reach the river. Reclamation has a long history of involvement with salinity and drainage in this area. Reclamation is under a court order to provide drainage to its San Luis Unit, on the Westside of the lower San Joaquin River (including the Grassland Subarea and the Westland Water District south of the Subarea). As part of its efforts to provide drainage (the San Luis Drainage Feature Reevaluation, http://www.usbr.gov/mp/sccao/sld/index.html), Reclamation has historically financially supported the Westside Regional Drainage Program (WRDP) activities that support implementation of the San Luis Drainage Feature Reevaluation preferred alternative.

Within the Action Plan, Reclamation identified Salt Load Reduction Actions that include Grassland Bypass Project, a component of the WRDP, and conservation programs (Water Use Efficiency Grant Programs, Water Conservation Field Services Program (WCFSP), Water 2025 Grants Program, and the CALFED Water Use Efficiency Program).

1. Grassland Bypass Project

The Grassland Bypass Project (GBP) has significantly reduced contamination of the Grasslands subarea and lower San Joaquin River. The focus of the GBP has been to control selenium loading, but the project has also reduced salt loading. The next phase of the GBP will include the construction of treatment facilities to remove all drainage from the GDA by 2015. Reclamation currently submits quarterly and annual reports to the Regional Water Board in compliance with its Waste Discharge Requirements. For the purposes of calculating salinity loading and credits, the GBP is considered a part of the Westside Regional Drainage Plan, and is not separately characterized. Since 1997 (the end of the historic period upon which the Basin Plan is based), the GBP has reduced its salt load to the lower San Joaquin River by 72 percent.

2. Westside Regional Drainage Plan

Description: The Grassland Area Farmers formed a regional drainage entity in March 1996 under the umbrella of the San Luis and Delta-Mendota Water Authority (SLDMWA) to implement the Grassland Bypass Project (http://www.usbr.gov/mp/grassland/). The Project consolidates subsurface drainage flows on a regional basis and utilizes a portion of the federal San Luis Drain to convey the flows around the habitat areas, in order to reduce the high selenium concentrations due to the transport of subsurface drainage flows through the same channels. Participants include the Broadview Water District, Charleston Drainage District, Firebaugh Canal Water District, Pacheco Water District, Panoche Drainage District, Widren Water District and the Camp 13 Drainage District (located in part of Central California Irrigation District). This entity includes approximately 97,000 gross acres of irrigated farmland, an area referred to as the Grassland Drainage Area. The Grassland Area Farmers, with state and federal funding support, have implemented several activities aimed at reducing discharge of subsurface drainage waters to the San Joaquin River. These activities have included the GBP (to remove drainage waters from wetland channels) and the San Joaquin River Improvement Project (SJRIP, the purchase and planting of an area land for the reuse and concentration of drainage water on increasingly salt tolerant crops). These efforts collectively have evolved into the Grassland Drainage Area's portion of the Westside Regional Drainage Plan.

The Westside Regional Drainage Plan (WRDP) was developed by stakeholders to address the immediate actions that could be taken to assist Reclamation in meeting the goals of the San Luis Drainage Feature Reevaluation Program with an in-valley solution. The WRDP focuses on regional drainage projects that can be implemented on a short timeline. The chief components include land retirement, groundwater management, source control, regional re-use, treatment, and salt disposal. Reclamation has been providing consistent funding, with a 50 percent cost share requirement, since 2006; as well as varying degrees of funding since 1996.

Status: The Grassland Bypass Project is in the 14th year of its implementation. Reclamation provided $3.5 million in grant funding in 2008 and expects to provide up more than $7.5 million[6] in funding in 2009 to implement the GBP. The GBP is also incorporated into the San Luis Delta-Mendota Water Authority's Integrated Regional Water Management Plan, and has been awarded implementation funds through California Proposition 50 in 2007. These funds are being used to implement components of the Westside Regional Drainage Plan by expanding and developing the drainage reuse area, implementing groundwater pumping programs, and investigating salt disposal technologies. Specific funded activities and cost-shares will be reported through the Draft and Final Reports Reclamation submits to the Regional Water Board in compliance with this Draft Plan. The current San Luis Drain Use Agreement expires in December of this year, and an Environmental Impact Report/Statement (EIR/EIS) has been released to cover a renewal of the Use Agreement.

Quantification Methodology: Reclamation calculates salinity loads from the Grassland Bypass Project using a simple load equation with a site-specific EC to TDS ratio. The EC to TDS ratio was developed using locally collected data. The load equation is:

$$L = Q * C * 0.74 * 0.0013599$$

Where:

L = Daily load of salts from Grassland Bypass Project, tons
Q = Daily flow from Grassland Bypass Project through San Luis Drain, acre feet
C = Daily electrical conductivity in San Luis Drain at Station B, μS/cm
0.74 = Site-specific EC to TDS ratio[7]
0.0013599 = Conversion Factor from Basin Plan

[6] Includes grants and assistance agreements with the Service, USGS, and CDFG.
[7] California Regional Water Quality Control Board, Central Valley Region, February 1998. Loads of Salt, Boron, and Selenium in the Grassland Watershed and Lower San Joaquin River: October 1985 to September 1995. Volume 1: Load Calculations. Page 15.

Daily loads are calculated because monthly averaging can result in significant over or underestimation of loads, due to the high variability in flows on a daily basis. The daily salt loads are then added to determine monthly loads.

The goal of the Grassland Bypass Project is to reduce the salinity load discharged to the San Joaquin River. Calculating the actual load of the Project is not enough to understand how salinity delivered into the region is transported through the region to the San Joaquin River. To take a step further in estimating the *reduced load* due to the Grassland Bypass Project, the subarea scale is again examined. The Basin Plan describes the regulated Load Allocation for the Grassland Subarea as a summation of a Consumptive Use Allowance, a DMC Water Supply Allowance and a prescribed Base Load Allocation. The Consumptive Use Allowance is based on real time flow data, while the Base Load Allocation and DMC Water Supply Allowance are based on prescribed numbers based on the design flow criteria. The DMC Water Supply Allowance is granted because it is expected to be offset by the load allocation imposed on the DMC.

USGS flow and salinity data at Mud Slough near Gustine (station 11262900) and at Salt Slough at Highway 165 near Stevinson (station 11261100) are used to calculate Mud Slough and Salt Slough salt loads, using site-specific EC:TDS conversion ratios, which are then combined to calculate actual subarea loads. This calculation includes groundwater accretions to Mud Slough and Salt Slough. In the development of the Basin Plan, groundwater accretions were estimated and removed from subarea loads and instead considered a portion of the base loads at Vernalis. So, in accordance with the schedule in Table 4-4 of Appendix 1 to the Technical TMDL Report for Salt and Boron in the Lower San Joaquin River (September 2003), prescribed groundwater accretions were scaled to represent only Mud and Salt Slough contributions, and then subtracted from the actual subarea load calculations.

Reclamation then calculated when actual loads in the subarea were less then the subarea's load allocation. Reclamation considers the reduced loads that are equivalent to the supply water allowance should be allowed to offset DMC excess loads, since these loads are no longer reaching the lower San Joaquin River. Table 4 walks through these calculations and presents other relevant information.[8] Figure 2 illustrates the calculations.

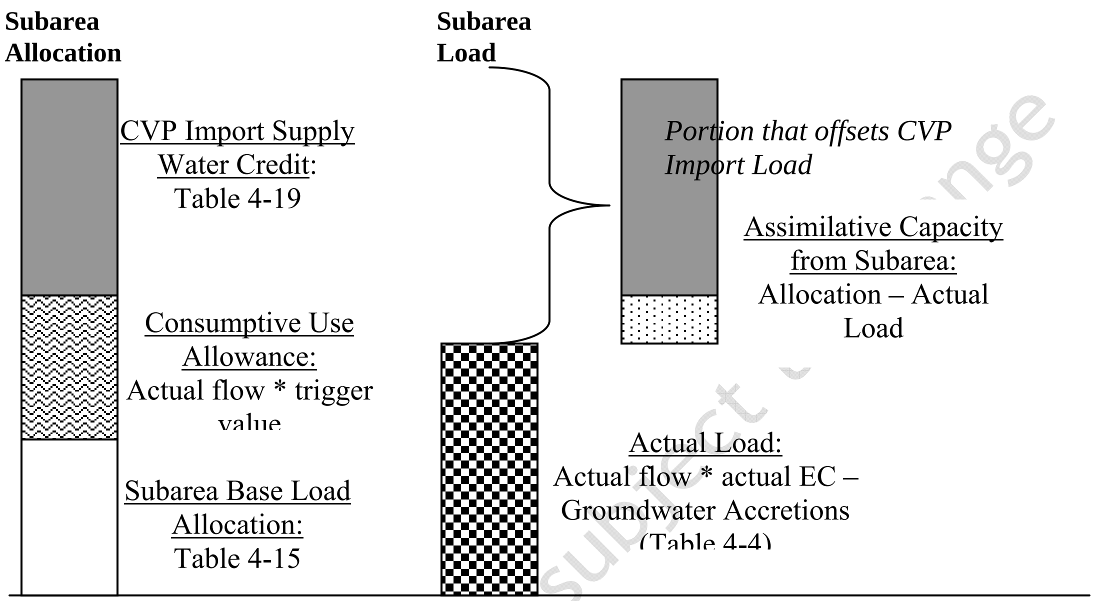
Data Collection and QA/QC: Monitoring flow and water quality of the Grassland Bypass Project is a collective effort by Reclamation, the Regional Water Board, Service, CDFG, SLDMWA, U.S. Environmental Protection Agency, and the USGS. The San Francisco Estuary Institute (SFEI) maintains a website and posts monthly and annual monitoring reports at http://www.sfei.org/grassland/reports/ gbppdfs.htm. There is also a good depiction of monitoring site locations within the monthly reports.

Daily GBP salinity loads are calculated using mean daily flow and salinity measurements made at the San Luis Drain terminus (Site B2). Information on probe types and QA/QC methodology is publicly available in the GBP annual reports and the QAPP. Because of

[8] All calculations assume the 2009 Water Year is dry for the San Joaquin River (for October, November, and December).

the lag in report posting to the website, Reclamation will obtain the data directly from the SLDMWA.

Figure 2: Assimilative Capacity Calculation for the Grassland Subarea



Flow and salinity are measured by the USGS at four other sites in the Grasslands Subarea. The real-time data are posted on the California Data Exchange Center and preliminary data are reported by USGS each month. Mud and Salt Slough flow and salinity data are collected by USGS at stations 11262900 and 11261100, respectively. Data from these two stations were used to estimate actual loads and Consumptive Use Allowances for the Grassland subarea.

<u>*Example:*</u> Table 2a of the SFEI monthly data reports contain the data for Q and C. Table 4 shows the monthly salt loads based on the computation and summation of daily salt loads using the equation above, for the year 2008. Monthly flows and monthly salinity averages are not included because daily values were summed to obtain the monthly tons. Daily values are available in the monthly data reports that are publicly available through October 2008. November and December data were obtained directly from the Grassland Drainage Authority. USGS data was used to calculate 2008 subarea loads and allocations.

Table 4: Offset Potential from Grassland Subarea, tons (Total Offset Potentials for DMC Load are in Bold)

	GBP discharge, tons		Flow in Mud Sl, TAF	EC in Mud Sl, µS/cm	Flow in Salt Sl, TAF	EC in Salt Sl, µS/cm	Base Load Allocation, tons (Table 4-15)	CVP Import Supply Water Credit (Table 4-19)	Subarea Ground-water Accretions, tons (Table 4-4, scaled to subarea)		Subarea Allocation, tons	Actual Subarea Load, tons	Assimilative Capacity provided by Subarea, tons
September to March Standard, 1000 µS/cm													
Jan	7,432		1.1	3,808	6.3	1,223	7,022	**3,300**	6,000		15,801	5,038	10,763
Feb	8,344		0.9	3,664	4.4	1,217	5,663	**8,900**	6,000		19,629	2,048	17,582
Mar	6,964		1.1	2,521	2.7	1,380	4,304	**17,200**	12,000		27,204	-5,942	33,146
April to August Standard, 700 µS/cm													
beg Apr	4,429		6.3	1,616	3.0	1,673	0	15,847	8,960		18,260	5,243	**13,017**
VAMP	7,633		4.9	2,252	6.1	1,574	0	24,507	14,060		27,177	5,070	**22,107**
end May	2,747		5.8	2,398	3.1	1,968	0	7,246	4,180		8,066	14,590	**0**
Jun	5,661		5.7	2,678	2.7	2,157	0	**33,300**	21,200		35,424	-1,651	37,075
Jul	4,136		6.9	2,603	7.7	1,618	0	32,500	18,400		34,443	9,815	**24,628**
Aug	2,856		0.9	3,664	4.4	1,217	0	**31,800**	10,800		33,197	-2,752	35,949
September to March Standard, 1000 µS/cm													
Sep	2,631		1.1	2,521	2.7	1,380	7,022	**27,500**	6,400		35,518	-342	35,860
Oct	3,595		6.3	1,616	3.0	1,673	11,552	**23,700**	5,200		37,695	9,003	28,692
Nov	4,523		4.9	2,252	6.1	1,574	10,193	13,000	5,600		26,067	13,528	**12,539**
Dec	5,384		5.8	2,398	3.1	1,968	10,419	5,300	6,000		18,065	12,773	**5,292**

2. Conservation Efforts

Description: A water conservation measure is a practice, technique, or technology that improves the efficient use of water and thus reduces water loss or waste. Although conservation is usually seen as a water management tool to increase supplies, conservation measures also enhance water quality through reducing irrecoverable flows to saline groundwater sinks, decreasing non–beneficial evapotranspiration, eliminating or significantly decreasing water runoff, decreasing leaching, and improving water quality through reduced fertilizer and pesticide application. When water conservation measures are developed and tailored to meet the needs of local conditions, water conservation enables water users to meet environmental obligations or regulations. A recent Agricultural Water Management Council report (AWMC 2006a) notes that irrigation system improvements also reduce drainage water runoff thereby reducing the regulatory burden on farmers and providing downstream environmental and public health benefits.

Reclamation's water use efficiency (WUE) program includes several grant programs (Water 2025, CALFED, and WCFSP) that fund actions to assure efficient use of existing water supplies. In addition to these grant programs, Reclamation also requires that all water contractors maintain current Water Management Plans which include Best Management Practices, all of which pertain to water use efficiency and conservation.

Status: The Water Conservation Program is an ongoing program mandated through the Reclamation Reform Act of 1982 (RRA) and the Central Valley Project Improvement Act of 1992 (CVPIA).

Quantification Methodology, Data Collection and QA/QC: Currently there is a lack of information regarding the baseline condition of many of the project implementation areas. Without sufficient baseline data, it is challenging to quantify actual changes in a project area. In addition, efforts to assess and project water use efficiency potential on farm are limited by the lack of reliable water use measurement data for agriculture.

Each grant application submitted to Reclamation must include requirements for performance and accountability; however, the recipients expected benefits of the proposed actions have generally been qualitative in nature. In addition, projects generally take 24 months to complete, and true impacts of a project can only be accurately assessed over a minimum period of five years to account for yearly temporal differences, variable cropping patterns, etc. The nature of the grant program makes it difficult for the recipient to implement a proper monitoring program due to cost and time limitations. Until a mechanism is developed to effectively capture this information and place the information in a centralized data repository, it will be difficult to quantify the contribution the WUE program on reduction to salinity impacts to the river.

Example: Although Reclamation is unable to quantify the benefits of the various funded projects as related to salinity reduction, the following information is provided to depict the agency's water conservation efforts in the basin. Through Water 2025, CALFED, and the WCFSP, Reclamation has awarded 36 projects in the San Joaquin Valley that require performance measures since 2006. As information is collected from these projects, quantifiable benefits may be determined in the future.

C. Mitigation Actions

In the Action Plan, Reclamation identifies two mitigation actions to mitigate salinity loads: a real time management program (RTMP) to maximize the removal of salt using assimilative capacity in the San Joaquin River, and a wetlands Best Management Practices (BMP) plan to research and potentially develop practices to reduce salinity loading from managed wetlands. Reclamation has actively supported the development of a real time monitoring and forecasting program in the River and in managed wetlands.

1. Real Time Management Program – Development of Stakeholder-Driven Program

Description: The Real Time Management Program is described in the Basin Plan as a stakeholder driven effort to use "real-time" water quality and flow monitoring data to support water management operations in order to maximize the use of assimilative capacity in the San Joaquin River. The Regional Board describes this assimilative capacity as up to 85 percent of the load determined by Vernalis salinity objective minus the actual load in the river and uses this adaptive approach as a means to encourage the maximum export of load from the basin while still meeting the stated objective.

The salinity issues in the San Joaquin River are complex and diverse, involving many interested stakeholders. The process of developing and implementing a successful program must have broad support and consensus from all parties. Work will include engaging stakeholders in developing a plan, addressing obstacles identified by stakeholders, and designing implementable strategies for the program, including the identification and implementation of physical infrastructure to facilitate real-time management. A neutral third party coordinator is necessary to manage the group's efforts and keep the focus on developing a viable program without bias through a collaborative process.

Status: Reclamation has contracted with a facilitation firm to support the development of a stakeholder-driven program. Currently, Reclamation is funding efforts, but anticipates that the program will explore cost-sharing arrangements. To date, a work plan has been developed which includes a stakeholder survey, scoping meetings, three workshops, work elements meetings, and technical group meetings. The program schedule, meeting notes, related documents, and additional information regarding the program are available at http://www.sanjoaquinriverrtmp.com/.

Quantification Methodology: Quarterly reports will include the status and quarterly accomplishments of the following Program tasks:

- Solicit stakeholder comments and feedback on RTMP
- Form working groups to develop program components
- Engage stakeholders in related basin activities
- Conduct periodic stakeholder workshops
- Develop an implementable program

Data Collection and QA/QC: Technical memorandums and work group products will be vetted through the stakeholder process and made available to all interested parties.

Example: Actions undertaken in 2008 include:

- Executed a contract to procure the service of a consultant to facilitate stakeholder involvement in developing a RTMP.
- Directed a consultant to develop and conduct a stakeholder survey to solicit feedback on the RTMP process and garner suggestions on salinity management in the basin.
- Conducted several coordinating and planning meetings to develop and prepare for the first stakeholder workshop held on January 8, 2009.

2. Real Time Management Program – Technical Support

Description: A successful RTMP will require a real time monitoring network and a model capable of reasonably accurate forecasting of assimilative capacity. The RTMP may also require the construction of new physical infrastructure to optimize the program. Reclamation is committed to participating in the process, supporting the development of data and analytical tools, and the study of the system capacity and physical infrastructure needs. Reclamation staff has valuable experience in all of these areas. The stakeholder process will direct the technical support of this program.

Status: Reclamation is already involved in the development of various tool and analytical models and will be an active participant in the various technical working groups. Reclamation has made personnel available to serve as technical resources to support the various working groups, and has retained some initial engineering support for other technical needs. Reclamation and DWR share a common interest in data collection on the San Joaquin and are working collaboratively to adapt the existing monitoring network to support the RTMP.

Quantification Methodology: Quarterly reports will include the status and quarterly accomplishments of the following Program tasks:

- Survey of existing tools/monitoring points
- Identify data/analysis gaps
- Stakeholder subgroup to scope and manage technical support efforts

Data Collection and QA/QC: Technical memorandums and work group products will be vetted through the stakeholder process and made available to all interested parties.

Example: In order to illustrate the potential use of assimilative capacity, Reclamation calculated the available daily capacity in 2008. In 2008, there was real time assimilative or dilution capacity present on 246 days of the year in the San Joaquin River (times at which the river was less than 85 percent of the Water Quality Objective) for a total of around 115,000 tons of salt (when calculated on a daily basis). On the other hand, the capacity of the river was exceeded on 119 days. The concept behind the RTMP is to enable the use of this dilution capacity to export salt loads from the basin or to better time the release of salinity loads into the river to times when there is greater dilution capacity, which should also reduce the times where river capacity is exceeded (to the extent that exceedances are caused by discharges and not by background or allowed loads). This management would most likely occur on a daily or weekly frequency.

Using the same data as was used to calculate Vernalis salinity (section F), Figure 3 and Table 5 were generated. Figure 3 illustrates the timing and magnitude of potential dilution capacity in tons for 2008, by calculating actual 2008 salinity loads at Vernalis and the Basin Plan load goals of meeting 85 percent of the Water Quality Objective. Table 5 illustrates assimilative capacity at Vernalis (allowed loads based on existing WQO and a margin of safety minus actual loads) in monthly loads (note that negative numbers indicate available assimilative capacity).

Figure 3: 2008 Vernalis Load and Assimilative Capacity, on a Daily Scale

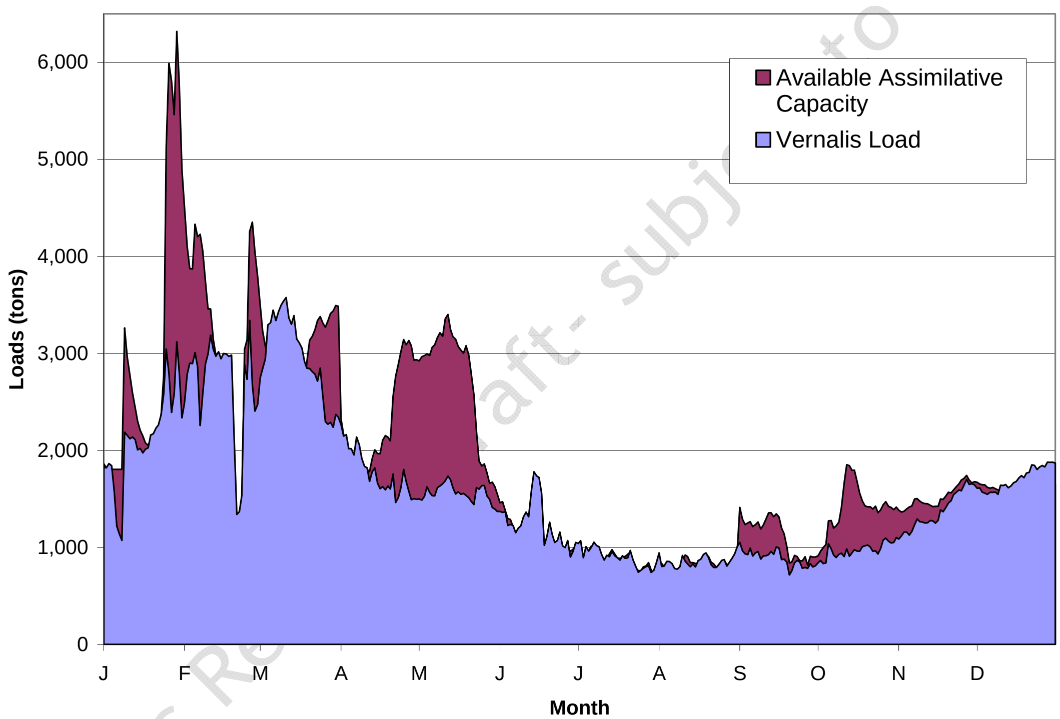


Table 5: Monthly "Real-Time" Assimilative Capacity at Vernalis, tons

	Vernalis Flow, TAF	Vernalis EC, µS/cm	Vernalis actual load, tons	Vernalis max load, tons	Assimilative Capacity, tons
September to March Standard, 1000 µS/cm					
Jan	136	681	78,011	97,384	19,373
Feb	133	750	84,096	95,339	11,243
Mar	133	847	94,881	95,215	334
April to August Standard, 700 µS/cm					
beg Apr	86	550	39,925	43,192	3,267
VAMP	190	308	49,498	95,765	46,268
end May	32	559	13,957	16,299	2,343
Jun	68	669	38,422	34,177	-4,245
Jul	55	611	28,325	27,519	-734
Aug	53	600	26,846	26,641	-204
September to March Standard, 1000 µS/cm					
Sep	48	687	27,530	34,084	6,554
Oct	62	600	31,240	44,236	12,996
Nov	65	763	41,566	46,293	4,727
Dec	73	870	53,670	52,438	-1,233

3. Wetlands Best Management Practices Plan

Description: Managed wetlands compose a majority of the acreage within the Grassland Subarea. Although wetlands do not increase salinity to the degree that agriculture does, there is a significant volume of imported water supplies that flow through the systems, resulting in discharges that are higher than the Vernalis water quality objectives. The Program to Meet Standards and the Action Plan describe the development of a strategic plan for identifying, studying and implementing Best Management Practices in managed wetlands. The goal of this concept is to reduce salinity in discharges while optimizing the ecological benefits of managed wetlands.

Status: Reclamation has been working with the Service, CDFG, and the Grassland Resource Conservation District to develop a Strategic Wetlands BMP Plan. Reclamation also provides resources to support the development of a real-time monitoring network (over 28 stations) and other potential BMP analysis tools within federal, state, and private managed wetlands. At present, the Plan has not been completed and released to the public. In 2009, Reclamation will work with the Service to facilitate the sharing of information on these tools between investigators, with the goal of finalizing a strategic plan for moving forward. Wetland water and salinity balances will also likely be explored through the RTMP.

Quantification Methodology: These efforts are not at a stage where they can be quantified. Reporting will focus on the status of Plan development and on study results.

Data Collection and QA/QC: See above.

Example: See status.

D. Central Valley Project Deliveries Load Calculation

Description: The Central Valley Project (CVP) delivers water to both the Grassland and Northwest subareas (as described in the Basin Plan) through the Delta-Mendota Canal (DMC). The DMC starts at the pumping headworks in the Delta, the C.W. Jones (Jones) Pumping Plant at Tracy, California. Water is conveyed south to the San Luis Reservoir, where water is mixed with the State Water Project in O'Neill Forebay and then either pumped into San Luis Reservoir for later delivery, or conveyed further south through the DMC to the Mendota Pool. Turnouts and groundwater pump-ins occur at several locations along the DMC. "Reach 1" of the DMC includes turnouts between the Jones Pumping Plant and the San Luis Reservoir. Deliveries for Reach 1 are made through the San Luis Canal and the Cross Valley Canal, as well as directly out of the DMC. "Reach 2" of the DMC includes turnouts between the O'Neill Forebay and the Mendota Pool. "Reach 3" covers deliveries made out of the Mendota Pool. Some simplification of this system has been made for accounting purposes, as some districts take portions of their deliveries through several turnouts.

Figure 4 is a map of the DMC water quality monitoring locations. Figure 5 is a map of the agencies served by the DMC.

Quantification Methodology: The Basin Plan allocates a load to Reclamation for water delivered to the Grassland and Northwest side Subareas. This load allocation is calculated according to Table IV-8 Summary of Allocations and Credits:

$$LA_{DMC} = Q_{DMC} * 52 \text{ mg/L} * 0.0013599$$

Where:

LA_{DMC} = Load Allocation of salts, in tons
Q_{DMC} = monthly amount of water delivered to Grassland and Northwest side subareas, in acre feet
52 = "background" TDS of water in the San Joaquin River at Friant per the Basin Plan
0.0013599 = factor for converting units into tons

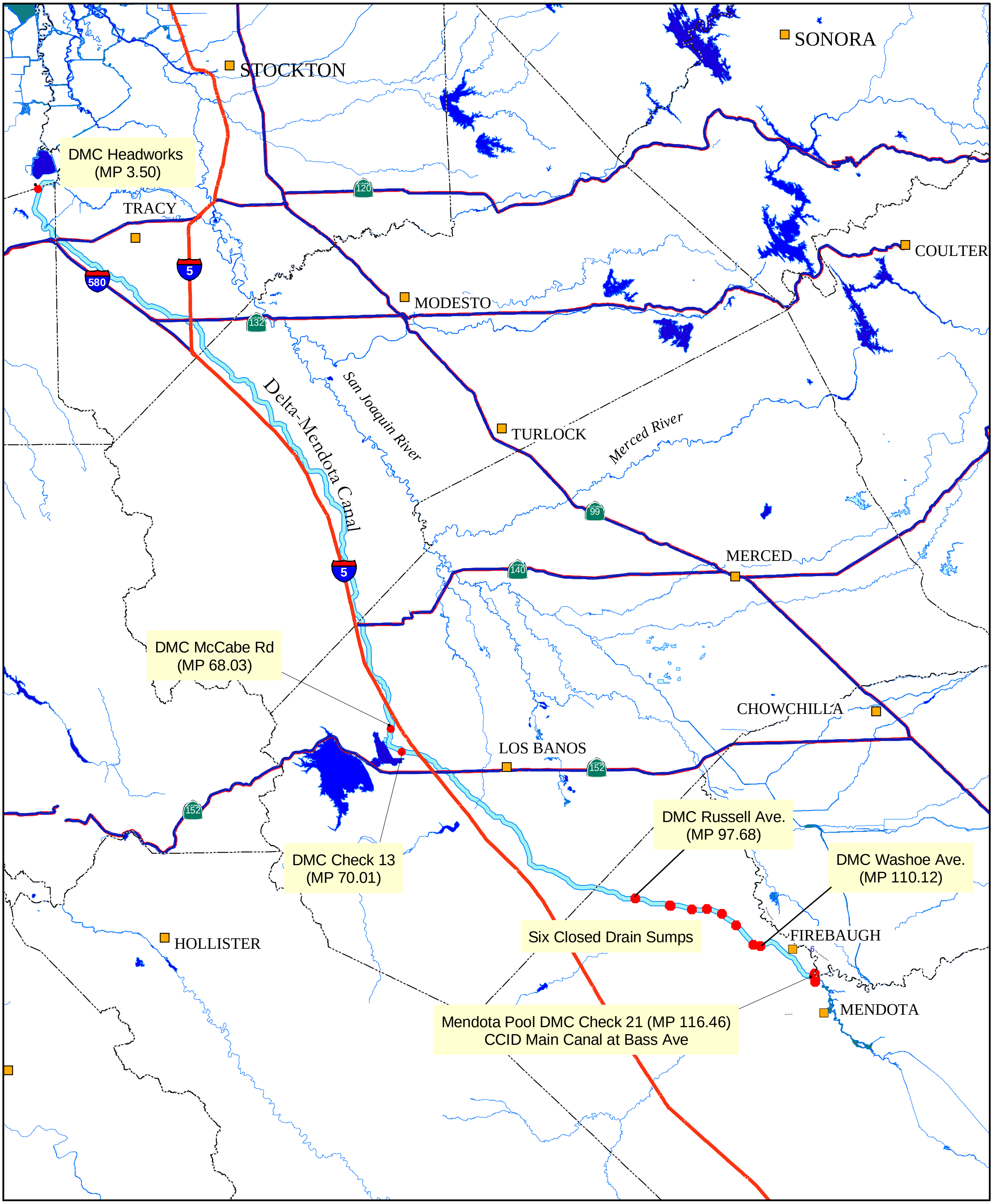


Figure 4.
Delta Mendota Canal
Water Quality Monitoring Sites

Miles
0 4 8 16 24 32

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6/6/03

Anything above this load allocation is an excess salt load which must be offset. Reclamation is proposing to offset this excess salt load through the actions described in the Action Plan. Excess salt loads are calculated by the following equation:

$$EL_{DMC} = Q_{DMC} * (C_{DMC} - 52 \text{ mg/L}) * 0.0013599$$

Where:

EL_{DMC} = excess salt load above the Load Allocation (LA_{DMC}), in tons
Q_{DMC} = monthly amount of water delivered to Grassland and Northwest side subareas, in acre feet
C_{DMC} = monthly average (arithmetic mean) of salinity of the water delivered to Grassland and Northwest Subareas, in mg/L
52 = "background" salinity of water in the San Joaquin River at Friant per Basin Plan
0.0013599 = factor for converting units into tons

Each delivery reach's Q_{DMC} is calculated and then paired with the associated monthly average EC for that reach, so the equation essentially becomes:

$$EL_{DMC} = 0.0013599 * \Sigma(Q_{DMC} * (C_{DMC} - 52 \text{ mg/L}))_{\text{Reach 1-3}}$$

This equation is then broken into two calculations, one for each subarea.

Data and QA/QC: Water delivery data is assembled by the San Luis Delta Mendota Water Authority's (SLDMWA) water master and submitted to Reclamation and SLDMWA members. Reclamation checks submitted numbers against contract schedules and measured pumping volumes at the Bill Jones Pumping Plant in Tracy and at O'Neill Forebay. CVO compiles and publishes this data on-line at: http://www.usbr.gov/mp/cvo/CVO_Rpts.html.

Data are publicly available shortly after the end of each month, and the pertinent reports are the San Joaquin and Mendota Pool (Table 24), Delta-Mendota Canal (Table 25), and San Luis and Cross Valley Canals (Table 26).

The delivered water is applied within contractors' service areas. Some service areas lie partially within the Grassland and/or Northwest subareas (defined in the Basin Plan). Since the subareas are given their own load allocations with a supply water credit, it is important to differentiate how much imported water is delivered to each subarea. Using the boundary description of subareas in the Basin Plan (Appendix 1, Item 41), Reclamation applied GIS tools to determine the proportion of acres for each service area that lies only partially within one or both subareas (less than 100 percent of the DMC supply water is used within the subarea). There are seven parties that apply less than 100 percent of their Delta water supplies within a subarea, and the percent of area that lies within each subarea are quantified in Table 6.

To compute the Q_{DMC} needed to compute excess loads, delivered water from each reach is summarized, in some cases prorated by the subset of irrigated or wetland acreage within the defined subareas.

Table 6: CVP Districts that are Less than 100 Percent Served by DMC Control Point

Recipient	Tables	Total Acres	Grassland		Northwest	
			Acres Served	Percent Served	Acres Served	Percent Served
CDFG - China Island Unit	24, 25	3,699	3,174	86%	525	14%
Central California ID	24, 25	149,814	129,805	87%	20,007	13%
Columbia Canal Co	24	16,719	15,762	94%		0%
Del Puerto WD	25	54,673	11,656	21%	43,017	79%
USFWS - San Luis NWR	24	28,048	23,712	85%		
Banta-Carbona ID	25	16,728			1,055	6%
West Stanislaus ID	25	22,192			21,291	96%

For each reach, daily EC data is averaged over the month[9] to determine C_{DMC}. Daily TDS measurements for the DMC Headworks and DMC Check 21, and electrical conductivity measurements for DMC Check 13 are publicly available at http://www.usbr.gov/mp/cvo/wqrpt.html. The CVO data are continuously collected and publicly available, so they are used to represent the water quality through this reach. EC and TDS are measured continuously (every 15 minutes) by Hydrolab MS5 sondes. The CVO probes are suspended in the middle of the canal. Currently the Check 21 probe is encased to prevent fouling due to debris; the probe at Check 13 is not. There is a proposal to encase the Check 13 probe in the near future. The CVO stations are maintained and calibrated every 2 months by personnel from Reclamation's Tracy Area Office. The EC probes are calibrated from a range of 0 – 2000 µS/cm according to manufacturer's recommendations. Although the probes generally demonstrate good stability, accuracy, and reproducibility between calibrations, previous data is not corrected if a calibration reveals sensor drift or other problems.

Reclamation also operates autosamplers at each site that collect daily composite samples. These data will be used to verify the CVO measurements and replace missing data. Reclamation currently publishes monthly reports of DMC water quality.

Example: The best way to demonstrate the calculation of DMC loads is through an example calculation. Reprints of CVO Water Delivery Report Tables 24 through 26 for 2008 are attached as Appendix B.

For the Grasslands Subarea, water delivery data is taken from all three Tables. Monthly deliveries from CVO Table 24 are multiplied by Check 21 TDS to determine total salinity loads, deliveries from CVO Tables 25 and 26 are multiplied by Check 13 EC and an EC:TDS conversion factor of 0.62 to determine total salinity loads. Where appropriate, deliveries are prorated to reflect the proportion of service area within the Grasslands Subarea (when less than 100 percent). Total salinity loads from the DMC and Mendota Pool are then summed for the subarea. Excess loads are calculated by subtracting a background allowance (the delivery flows multiplied by a C_{BG} of 85 µS/cm) from the calculated total loads. Excess load calculations are demonstrated in Tables 7 through 9.

[9] To be consistent with the Vernalis WQO calculation.

For the Northwest Subarea, water delivery data is taken from CVO Tables 24 and 25. Monthly deliveries from CVO Table 24 are multiplied by Check 21 tds to determine total salinity loads, deliveries from CVO Table 25 are multiplied by DMC Headworks TDS to determine total salinity loads. Where appropriate, deliveries are prorated to reflect the proportion of service area within the Northwest Subarea (when less than 100 percent). Total salinity loads from the DMC and Mendota Pool are then summed for the subarea. Excess loads in CVP water delivered to the Northwest Subarea are calculated by subtracting a background allowance (the delivery flows multiplied by a C_{BG} of 52 MG/l) from the calculated total loads. Excess load calculations are demonstrated in Table 10.

Excess CVP salinity loads from deliveries to both subareas are summarized in Table 11.

Table 7: 2008 San Joaquin River and Mendota Pool Deliveries from CVP (Grassland Subarea)

	Laguna WD (via CCID),TAF	San Luis WD (via CCID), TAF	Central California ID (CCID), TAF	Columbia Canal Co, TAF	Firebaugh Canal WD, TAF	San Luis Canal Co (SLCC), TAF	Grassland WD (via CCID & SLCC), TAF	Kesterson (USFWS) (via CCID), TAF	Los Banos WMA (CDFG) (via CCID), TAF	San Luis NWR (USFWS) (via SLCC), TAF	China Island Unit (CDFG), TAF	Salt Slough Unit (CDFG), TAF	Freitas Unit (USFWS) (via CCID), TAF	Total Deliveries, TAF	Average TDS at Check 21, mg/L	Monthly Salt Load, thousand tons
Multiplier	1.00	1.00	0.87	0.94	1.00	1.00	1.00	0.85	1.00	0.85	0.86	1.00	0.85	NA	NA	NA
September to March Standard, 1000 µS/cm																
Jan	0	0	0	0	0.4	0	4.9	0	1.8	3.2	0.6	0.8	1.1	12.7	451	7.8
Feb	0	0.08	15.2	1.5	4.0	3.9	4.3	0.6	0.9	7.9	0.7	0.6	0.3	40.8	384	21.3
Mar	0	0.02	38.8	4.7	3.9	11.4	0.5	0.2	0.3	1.5	0.1	0.2	0.1	61.9	415	34.9
April to August Standard, 700 µS/cm																
Beg Apr	0	0	16.8	3.5	3.9	10.1	0.2	0.1	0.2	0	0.1	0.1	0.2	35.1	361	17.2
VAMP	0	0.02	40.7	6.0	5.4	14.3	2.5	0.1	0.3	1.7	0.1	0.2	0.1	71.5	359	34.9
End May	0	0.03	13.7	1.8	1.5	4.1	1.0	0	0.1	0.7	0	0.1	0.1	23.1	335	10.5
Jun	0	0.04	42.6	7.5	6.2	24.9	0.9	0	0.1	0	0.1	0.1	0	82.5	362	40.5
Jul	0	0.05	52.6	8.2	5.4	27.5	0.1	0	0.1	0	0.2	0.1	0	97.9	271	36.1
Aug	0	0.04	44.7	8.3	5.5	24.2	0.4	0	0.5	0	0.1	0.2	1.0	84.0	336	38.4
September to March Standard, 1000 µS/cm																
Sep	0	0	25.8	6.0	3.3	6.1	19.8	0	3.2	4.9	0.9	1.4	1.9	72.3	393	38.7
Oct	0	0	26.0	3.3	2.1	2.0	9.6	0	4.6	3.5	0.8	1.6	1.4	55.4	330	24.9
Nov	0	0	1.6	0	1.7	2.8	10.2	1.0	2.4	2.5	0.9	1.2	0	25.7	320	11.2
Dec	0	0	0	0	0.9	0	0	0	0	0	0	0	0.8	0.9	504	0.6

Table 8: 2008 Delta- Mendota Canal Deliveries from CVP (Grassland Subarea)

	Del Puerto WD,TAF	Eagle Field WD, TAF	Mercy Springs WD, TAF	Oro Loma WD, TAF	Panoche WD - Ag, TAF	Panoche WD - M&I, TAF	San Luis WD - Ag, TAF	San Luis WD - M&I, TAF	Central California ID (Abv C, TAF	Central California ID (Blw C, TAF	Firebaugh Canal WD, TAF	Total Deliveries, TAF	Average EC at Check 13, µS/cm	Monthly Salt Load, thousand tons
Multiplier	0.21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.87	1.00	NA	NA	NA
September to March Standard, 1000 µS/cm														
Jan	0	0	0	0	0.1	0	0	0	0	0.4	0.1	0.6	673	0.3
Feb	0	0	0	0.1	0.1	0	0.2	0	0	0.8	0.2	1.6	557	0.7
Mar	1.0	0	0.1	0	1.0	0	0.7	0	1.0	7.6	0.4	11.8	557	5.5
April to August Standard, 700 µS/cm														
Beg Apr	1.3	0	0.1	0	0.5	0	0.4	0	1.0	4.3	0.3	7.8	451	3.0
VAMP	2.0	0	0.2	0	0.8	0	0.6	0	1.9	9.4	1.5	16.3	534	7.3
End May	0.6	0	0.1	0	0.2	0	0.2	0	0.6	3.1	0.6	5.3	501	2.2
Jun	1.8	0	0.1	0	0.9	0	0.9	0	1.8	17.3	2.5	25.3	523	11.2
Jul	1.9	0	0.2	0	0.8	0	1.3	0	1.6	23.5	3.9	33.1	376	10.5
Aug	2.0	0.1	0.1	0	0.7	0	0.7	0	1.9	23.1	2.0	30.5	468	12.0
September to March Standard, 1000 µS/cm														
Sep	1.1	0	0.2	0	0.2	0	0.4	0	1.4	0.4	0.1	3.7	566	1.8
Oct	0.6	0	0.2	0	0.1	0	0.2	0	0.8	0.2	0	2.1	508	0.9
Nov	0.2	0	0	0	0.2	0	0	0	0.3	0.1	0.1	0.9	612	0.4
Dec	0.1	0	0	0	0.1	0	0.1	0	0.7	0	0	0.9	753	0.6

Table 8 (Continued): 2008 Delta- Mendota Canal Deliveries from CVP (Grassland Subarea)

	China Island Unit (CDFG) (76,TAF	Frietas Unit (USFWS) (76.05L), TAF	Salt Slough Unit (CDFG) (76, TAF	Los Banos WMA (CDFG) (76.05), TAF	Volta WMA (CDFG), TAF	Grassland WD (76.05L & CCID), TAF	Grassland WD (Volta Wasteway), TAF	Kesterson Unit (USFWS) (Volta Wasteway), TAF	Kesterson Unit (USFWS) (76.0), TAF	Total Deliveries, TAF	Average EC at Check 13, µS/cm	Monthly Salt Load, thousand tons
Multiplier	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	NA	NA
September to March Standard, 1000 µS/cm												
Jan	0	0	0	0	0.2	1.1	0	0.6	0	1.8	673	1.0
Feb	0	0	0	0	0.4	6.0	0.7	0	0	7.2	557	3.4
Mar	0.4	0.8	0.5	0.5	0	1.5	0	0	0.6	4.2	557	2.0
April to August Standard, 700 µS/cm												
Beg Apr	0.2	0.4	0.3	0.5	0	0.6	0.3	0	0.2	2.5	451	1.0
VAMP	0.3	0.5	0.6	0.8	0.3	6.6	2.8	0	0.3	12.1	534	5.5
End May	0.1	0.2	0.2	0.2	0.1	2.6	1.1	0	0.1	4.5	501	1.9
Jun	0.2	0.3	0.4	0.3	0.3	2.7	1.0	0	0.1	5.1	523	2.3
Jul	0.5	0	0.4	0.4	0	0.4	0	0	0	1.8	376	0.6
Aug	0.4	0	0.5	0.7	1.9	1.2	0.3	0	0	5.0	468	2.0
September to March Standard, 1000 µS/cm												
Sep	0	0	0	0	2.6	21.6	17.0	0.9	0	42.1	566	20.1
Oct	0	0	0	0	2.8	12.7	11.8	1.5	0	28.8	508	12.3
Nov	0	0	0	0	1.5	7.6	1.0	0	0	10.1	612	5.2
Dec	1.0	0.9	0.9	0.8	0.2	0.5	0.3	0	0.8	5.5	753	3.5

Table 9: 2008 San Luis and Cross Valley Canal Deliveries from CVP (Grassland Subarea)

	CDFG - O'Neill Forebay WMA, TAF	City of Dos Palos, TAF	Pacheco WD, TAF	Pacheco CCID Non-project (Hamburg), TAF	Panoche WD, TAF	San Luis WD, TAF	San Luis WD - Ag (via O'Neill Forebay), TAF	San Luis WD - M&I (via O'Neill Forebay), TAF	VA Cemetery, TAF	Total Deliveries, TAF	Average EC at Check 13, µS/cm	Monthly Salt Load, thousand tons
Multiplier	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	NA	NA	NA
September to March Standard, 1000 µS/cm												
Jan	0.1	0.1	0	0.1	0.1	0.6	0	0	0	1.1	673	0.6
Feb	0	0.1	0	0.8	1.2	3.5	0.3	0	0	5.9	557	2.8
Mar	0	0.1	0.2	1.1	3.3	5.5	0.7	0.1	0	11.0	557	5.2
April to August Standard, 700 µS/cm												
Beg Apr	0	0.1	0	1.0	3.4	5.0	0.5	0.1	0	10.1	451	3.8
VAMP	0.2	0	0.1	0	0	0	0	0	0	0.4	534	0.2
End May	0	0	0	0.4	1.5	2.6	0.2	0	0	4.8	501	2.0
Jun	0.1	0.2	0.8	0.8	4.9	8.9	0.8	0.2	0	16.7	523	7.3
Jul	0.1	0.2	1.0	0	4.9	10.5	1.2	0.1	0	18.0	376	5.7
Aug	0.1	0.2	0.7	0	2.1	6.8	0.7	0.1	0	10.7	468	4.2
September to March Standard, 1000 µS/cm												
Sep	0.1	0.1	0.3	0	1.2	3.8	0.4	0.1	0	6.1	566	2.9
Oct	0.1	0.1	0	0.1	0.9	4.7	0.3	0.1	0	6.4	508	2.8
Nov	0.1	0.1	0	0.1	0.3	2.7	0.2	0.1	0	3.6	612	1.8
Dec	0.1	0	0.1	0	0.3	0	0.1	0	0	0.7	753	0.4

Table 10: 2008 Deliveries from CVP to Northwest Subarea)

	San Joaquin River and Mendota Pool Deliveries from CVP					*Delta- Mendota Canal Deliveries from CVP*									
	China Island Unit (CDFG), TAF	Central California ID (CCID), TAF	Total Deliveries, TAF	Average TDS at Check 21, mg/L	Monthly Salt Load, thousand tons	Banta-Carbona ID, TAF	Del Puerto WD, TAF	Patterson WD, TAF	West Stanislaus ID, TAF	Central California ID (Abv Ck13), TAF	Central California ID (Blw Ck 13), TAF	China Island Unit (CDFG) (76), TAF	Total Deliveries, TAF	Average TDS at Headworks, mg/L	Monthly Salt Load, thousand tons
Multiplier	0.14	0.13	NA	NA	NA	0.06	0.79	1.00	0.96	0.13	0.13	0.14	NA	NA	NA
September to March Standard, 1000 μS/cm															
Jan	0.1	0	0.1	451	0.1	0	0	0	0	0	0.1	0	0	416	0
Feb	0.1	2.3	2.4	384	1.3	0	0.2	0.4	0	0	0.1	0	0.6	358	0.3
Mar	0	6.0	6.0	415	3.4	0	3.5	0	0.7	0.2	1.2	0.1	3.6	427	2.1
April to August Standard, 700 μS/cm															
Beg Apr	0	2.6	2.6	361	1.3	0	4.7	0.1	1.9	0.2	0.7	0	4.9	347	2.3
VAMP	0	6.2	6.3	359	3.1	0	7.3	0.5	2.2	0.3	1.4	0	7.8	275	2.9
End May	0	2.1	2.1	335	1.0	0	2.2	0.2	0.6	0.1	0.5	0	2.3	325	1.0
Jun	0	6.5	6.5	362	3.2	0	6.7	0.9	2.8	0.3	2.7	0	7.6	340	3.5
Jul	0	8.6	8.6	271	3.2	0	7.0	1.0	3.4	0.2	3.6	0.1	8.0	240	2.6
Aug	0	6.9	6.9	336	3.1	0	7.3	1.0	3.8	0.3	3.6	0.1	8.3	315	3.6
September to March Standard, 1000 μS/cm															
Sep	0.1	4.0	4.1	393	2.2	0	4.2	1.5	1.5	0.2	0.1	0	5.7	355	2.7
Oct	0.1	4.0	4.1	330	1.9	0	2.3	0.6	0	0.1	0	0	2.9	225	0.9
Nov	0.1	0.2	0.4	320	0.2	0	0.8	0.1	0	0	0	0	0.9	179	0.2
Dec	0	0	0	504	0	0	0.2	0	0	0.1	0	0.2	0.2	483	0.2

Table 11: Example Calculation of 2008 CVP "Excess" Loads

	Grassland Subarea						Northwest Subarea					Total
	San Joaquin River and Mendota Pool Deliveries from CVP, load in tons	Delta- Mendota Canal Deliveries from CVP, load in tons	San Luis and Cross Valley Canal Deliveries from CVP, load in tons	Total Flow, TAF	Background Allowance Load, tons	Excess Load, tons	San Joaquin River and Mendota Pool Deliveries from CVP, load in tons	Delta- Mendota Canal Deliveries from CVP, load in tons	Total Flow, TAF	Background Allowance Load, tons	Excess Load, tons	Total Excess Load from CVP Deliveries, tons
September to March Standard, 1000 μS/cm												
Jan	7,788	1,369	645	16.2	1,148	8,654	56	26	0.1	10	72	**8,727**
Feb	21,264	4,079	2,780	55.4	3,912	24,212	1,274	271	3.0	212	1,333	**25,544**
Mar	34,925	7,075	5,179	88.0	6,215	40,963	3,377	2,069	9.5	675	4,772	**45,735**
April to August Standard, 700 μS/cm												
Beg Apr	17,216	3,469	3,838	54.3	3,836	20,686	1,273	2,289	7.4	526	3,036	**23,722**
VAMP	34,851	11,921	169	98.3	6,946	39,995	3,055	2,913	14.1	993	4,975	**44,969**
End May	10,525	3,895	2,035	37.1	2,624	13,831	961	1,034	4.4	314	1,681	**15,512**
Jun	40,534	12,611	7,349	127.7	9,024	51,470	3,218	3,521	14.2	1,000	5,739	**57,209**
Jul	36,140	10,483	5,703	148.9	10,523	41,803	3,193	2,622	16.7	1,180	4,635	**46,439**
Aug	38,398	13,224	4,236	128.3	9,065	46,793	3,150	3,555	15.2	1,074	5,631	**52,425**
September to March Standard, 1000 μS/cm												
Sep	38,667	21,317	2,922	123.1	8,702	54,204	2,194	2,748	9.8	693	4,249	**58,453**
Oct	24,866	12,953	2,753	92.1	6,506	34,067	1,852	874	7.0	493	2,233	**36,299**
Nov	11,178	5,568	1,833	40.0	2,826	15,753	167	215	1.3	89	293	**16,046**
Dec	628	3,998	433	7.9	558	4,501	0	158	0.2	17	141	**4,642**

E. Future Actions

Reclamation is currently involved in several planning studies and long-term projects that would 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 may not be known for some time. Projects include, but are not limited to, 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)
- Franks Tract Project (formerly the Flooded Islands Study)
- Delta Habitat Conservation and Conveyance Program
- San Joaquin River Restoration Program
- Upper San Joaquin River Basin Storage Studies

Both Reclamation and the Board have agreed to revise the MAA when any of the above actions are implemented. For example, federal legislation authorizing the San Joaquin River Restoration Settlement Act was recently enacted and should result in spring and fall water releases from Millerton Dam beginning in the fall. It is unknown at this time what amount of that water will be conveyed to the lower San Joaquin River. Reclamation will document the methodology of any new quantification, such as dilution flows for salinity, when enough information becomes available. Reclamation will report on potential and expected salinity benefits from these projects. Otherwise, Reclamation will report on document availability.

F. Vernalis Water Quality

Description: The Water Quality Objective (WQO) that the Basin Plan Amendment addresses is Salinity and Boron at Vernalis, in the lower San Joaquin River. The boron objectives are considered met if the salinity objectives are met. The WQOs are split into two separate seasonal objectives: 1000 µS/cm EC from September 1 to March 31 and 700 µS/cm EC from April 1 to August 31.

Quantification Methodology: Because the goal of the Basin Plan is to achieve these objectives, each quarterly report will include a section with tabular and graphical representations of this outcome. Vernalis water quality will be downloaded from the CDEC water data base at http://cdec.water.ca.gov for both VER (a Reclamation monitoring station) and SJR (a new Department of Water Resources (DWR) monitoring station). Two years ago, Reclamation moved its Vernalis sampling station to a location within 15 feet of the new DWR monitoring station. Data will be downloaded from CDEC as daily values, and a thirty day average will be calculated beginning with the 29 days prior to the start of the reporting period.

Data and QA/QC: Reclamation data will be used in preference to calculate mean monthly averages and a running thirty day average over the reporting period. Reclamation's water quality monitoring device is placed directly in the San Joaquin River, while DWR's sampling station withdraws water from the River into its sampling station. Reclamation maintains the Hydrolab

MS5 sonde every two months according to the procedure outlined in Appendix A, calibrating from 0- 2000 according to manufacture's procedure.

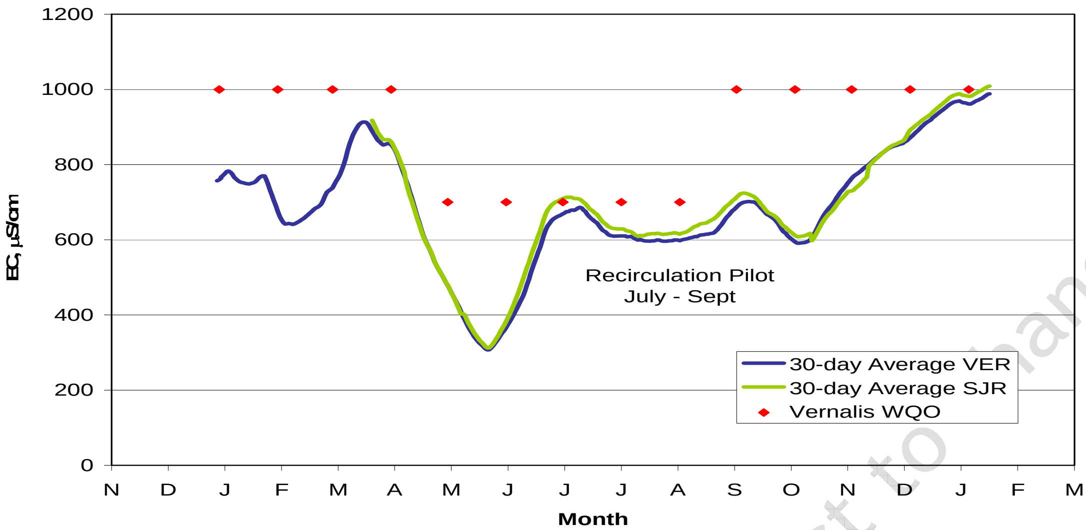
Example: The running thirty-day average salinity for 2008 was calculated using this methodology and is presented in Figure 4[10]. The monthly mean EC[11] for 2008 is presented in Table 12. Both 2007 and 2008 were classified as critical years for the San Joaquin River.

Table 12: 2008 Monthly mean EC at Vernalis, µS/cm

	Reclamation Station	DWR Station
September to March Standard, 1000 µS/cm		
Jan	686	
Feb	750	
Mar	847	856
April to August Standard, 700 µS/cm		
beg Apr	550	548
VAMP	308	313
end May	509	551
Jun	669	710
Jul	611	630
Aug	600	617
September to March Standard, 1000 µS/cm		
Sep	687	713
Oct	600	617
Nov	763	755
Dec	870	887

[10] Footnote 2 to Table 2 of Water Rights Decision 1641 (revised) states "Determination of compliance with an objective expressed as a running average begins on the last day of the averaging period. The averaging period commences with the first day of the time period for the applicable objective. If the objective is not met on the last day of the averaging period, all days in the averaging period are considered out of compliance."
[11] Note, the monthly mean EC is mathematically closest to the last day of the running 30 day average EC.

Figure 6: 2008 Vernalis Water Quality



G. Reporting Requirements

In the MAA, Reclamation agreed to provide quarterly reports to the Regional Board. The first quarter 2009 report is attached as Appendix C. Reclamation will consult with the Regional Board before proposing any changes to the sample report format. Quarterly reports are due 45 days after the end of the calendar quarter:

Table 13: Reporting Milestones

End of calendar quarter	Due date of Quarterly report
December 31, 2008	February 13, 2009
March 31, 2009	May 15, 2009
June 30, 2009	August 14, 2009
September 30, 2009	November 13, 2010
December 31, 2009	February 12, 2010
March 31, 2010	May 14, 2010
June 30, 2010	August 13, 2010
September 30, 2010	November 12, 2010
December 31, 2010	February 14, 2011

Reclamation also agreed to prepare an annual report on compliance, due by July 1, 2010. The annual report will follow the same format as used in the Draft Plan.

H. Funding Reporting

In the MAA, Reclamation agreed to seek additional funding, including grant funding, to support salinity control efforts. Reclamation is operated on a three year budget cycle. Budget is requested two years in advance, and not all annual budgets are spent within a year but rather obligated to a specific contract or grant. Reclamation will report its funding based on the official report provided from the Office of Management and Budget. Activities for which Reclamation has requested funding will also be reported. Fiscal years run from October 1 to September 30 (similar to the water year). In its quarterly reports, Reclamation will report on other efforts to support the securing of additional funding.

I. Monitoring Program

To support the actions described in this Draft Plan and to support evaluation of salinity loads, Reclamation will work with the Regional Board to develop a monitoring program. As a first step, Reclamation has identified existing monitoring data to support its evaluations of baseline, reductions, and offsets. Table 14 lists the existing monitoring sites used in the Draft Plan.

Table 14: Monitoring Locations used in Draft Plan

Symbol (Sensor)	Description	Parameter	Operator	Frequency	Website
Reservoir Operations Reports (Goodwin)	River Spills from Goodwin Reservoir	Flow, cfs	Reclamation	Daily	http://www.usbr.gov/mp/cvo/reports.htm l
Supplemental Water Contributions	Flows provided under the VAMP Agreement from Merced and Tuolumne Rivers	Flow, cfs	San Joaquin River Group	Daily	www.sjrg.org/technicalreport
Newman Wasteway Recirculation	Recirculation Flows (Newman Wasteway MP 6.88)	Deliveries, AF	SLDMWA Water Master and Reclamation CVO	Monthly (based on daily)	http://www.usbr.gov/mp/cvo/deliv.html
Monthly Water Deliveries	DMC, Cross Valley Canal, San Luis Canal, Delta- Mendota Pool, and San Joaquin River	Deliveries, AF	SLDMWA Water Master and Reclamation CVO	Monthly	http://www.usbr.gov/mp/cvo/deliv.html
VNS	San Joaquin River at Vernalis	Flow, cfs	USGS and DWR	Hourly/Daily	http://cdec.water.ca.gov/
USGS 11290000	Tuolumne River at Modesto	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
USGS 11303000	Stanislaus River Near Ripon	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
USGS 11262900	Mud Slough (N) near Gustine	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
USGS 11261100	Salt Slough at Hwy 165 near Stevinson	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
USGS 11272500	Merced River near Stevinson	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
DWR B05125 (MST)	Merced River near Stevinson	Discharge, cfs	DWR	Continuous	http://waterdata.usgs.gov/nwis
USGS 11303500	SJR at Vernalis	Discharge, cfs	USGS	Continuous	http://waterdata.usgs.gov/nwis
RPN (100)	Stanislaus River at Ripon	EC, µS/cm	Reclamation	Hourly/Event	http://cdec.water.ca.gov/
MST (100)	Merced River at Stevinson	EC, µS/cm	DWR	Hourly	http://cdec.water.ca.gov/
MOD (100)	Tuolumne River at Modesto	EC, µS/cm	DWR	Hourly	http://cdec.water.ca.gov/
NWDS	Newman Wasteway MP 8.16	EC, µS/cm	Reclamation	Continuous during study	http://www.usbr.gov/mp/dmcrecirc/index .html *Not yet released to public.*
Grassland Bypass Project Station B2	Terminus of the San Luis Drain	Flow, cfs EC, µS/cm	SLDMWA	Daily (EC also continuous)	http://www.sfei.org/grassland/reports/ind ex.htm
DMC Check 13	In DMC, immediately downstream of O'Neill Forebay	EC, µS/cm	Reclamation	Continuous	http://www.usbr.gov/mp/cvo/wqrpt.html
DMC Check 21	Entrance to Mendota Pool	EC, µS/cm	Reclamation	Continuous	http://www.usbr.gov/mp/cvo/wqrpt.html
VER	San Joaquin River at Vernalis	EC, µS/cm	Reclamation	Continuous	http://cdec.water.ca.gov/
SJR	San Joaquin River at Vernalis	EC, µS/cm	DWR	Continuous	http://cdec.water.ca.gov/

J. Offset Program

Reclamation proposes to continue to work with the Regional Water Board and stakeholders to develop representative and acceptable accounting of excess loads, offsets, credits, and trading of loads. Sections A through C of the Draft Plan quantified, where possible, the potential sources of offsets or credits. Table 15 combines these individual calculations with the DMC load calculations and Vernalis salinity.

Table 15: Calculated Loads and Assimilative Capacity of Individual Draft Plan Elements, tons of salt

	DMC Excess Load	A-1: New Melones	A-2: WAP	A-4: Recirc-ulation	B-3: WRDP	C-2: RTMP Capacity	Vernalis average Salinity, µS/cm
September to March Standard, 1000 µS/cm							
Jan	8,727	4,310	0		3,300	19,373	686
Feb	25,544	2,900	0		8,900	11,243	750
Mar	45,735	8,342	0		17,200	334	847
April to August Standard, 700 µS/cm							
Beg Apr	23,722	9,775			13,017	3,267	550
VAMP	44,969	11,784	19,704		22,107	46,268	308
End May	15,512	2,550			0	2,343	509
Jun	57,209	5,401	0		33,300	-4,245	669
Jul	46,439	5,220	0		24,628	-734	611
Aug	52,425	3,968	0	3,901	31,800	-204	600
September to March Standard, 1000 µS/cm							
Sep	58,453	3,252	0	2,763	27,500	6,554	687
Oct	36,299	5,819	5,770		23,700	12,996	600
Nov	16,046	4,215	0		12,539	4,727	763
Dec	4,642	4,150	0		5,292	-1,233	870

In the course of developing this information, Reclamation has identified three issues warranting further exploration as the implementation of the Basin Plan proceeds:

1. There is a time lag between delivery of DMC supplies to the Northwest and Grassland subareas and discharges to the San Joaquin River. This time lag varies by the activity using the water supply and the interaction with groundwater (groundwater is not dynamically addressed in the Basin Plan). In this Draft Plan, the time lag is not addressed but it could be important in the way in which Reclamation meets this regulation versus the D1641 requirement to provide flow to meet the Vernalis salinity objective.

2. In order to determine benefits from the WRDP, an accounting method is needed to determine the avoided discharge loads.

3. In consideration of the future implementation of the Basin Plan, Reclamation believes it is important that any offsets or credits generated by Reclamation activities not harm the

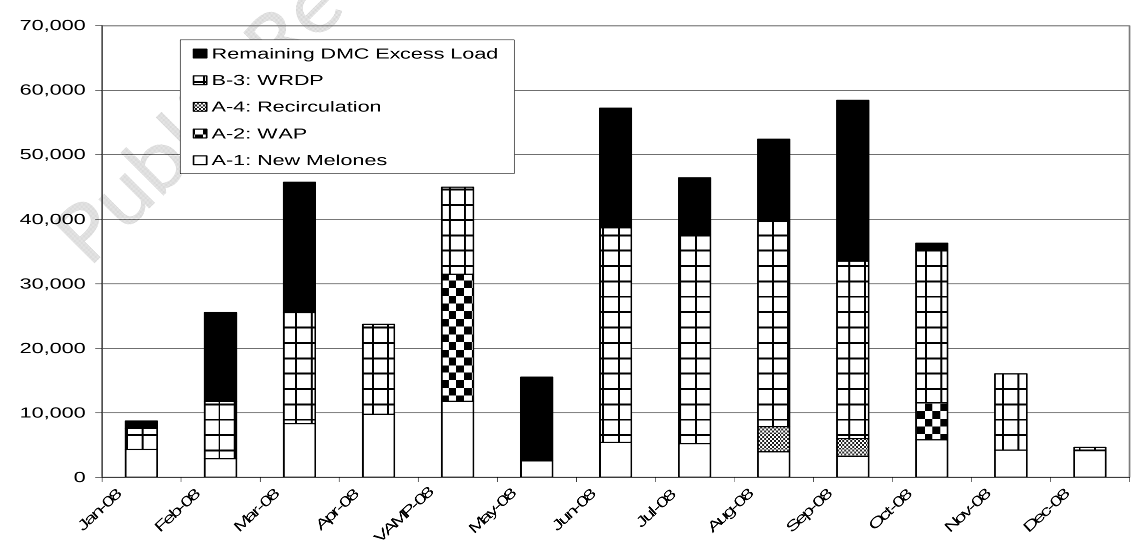
ability of a subarea to meet its TMDL obligations. Also, in these calculations, some dilution flows provided by Reclamation are currently being used by subareas to provide assimilative capacity.

Within the MAA is a goal for Reclamation to offset or reduce DMC excess loads by 25 percent by July 2010. Table16 presents the information from Table 15 in the form of percentages that potential offsets offset excess loads from the DMC. Figure 7 displays this information graphically.

Table 16: Percent Plan Actions Offset CVP Supply Imports, tons

	A-1: New Melones	A-2: WAP	A-4: Recirc-ulation	B-3: WRDP	C-2: RTMP Capacity	Sum of Plan Actions	Salinity at Vernalis µS/cm
September to March Standard, 1000 µS/cm							
Jan	49%			38%	>100%	87%	681
Feb	11%			35%	44%	46%	750
Mar	18%			38%	1%	56%	847
April to August Standard, 700 µS/cm							
beg Apr	41%			67%	14%	>100%	550
VAMP	26%	44%		54%	>100%	>100%	308
end May	16%			0%	15%	16%	509
Jun	9%			58%	0%	68%	669
Jul	11%			70%	0%	81%	611
Aug	8%		7%	61%	0%	76%	600
September to March Standard, 1000 µS/cm							
Sep	6%		5%	47%	11%	57%	687
Oct	16%	16%		65%	36%	97%	600
Nov	26%			81%	29%	>100%	763
Dec	89%			>100%	0%	>100%	870

Figure 7: Offset Loads from Plan Actions against DMC Excess Load, in Tons



Appendix A: Sonde Multiprobe (Yellow Springs Instruments) – Operation and Calibration

USBR, Branch of Environmental Monitoring (MP-157) SOP #_____

SUMMARY

This SOP describes operation and calibration procedures for the Yellow Springs Instruments (YSI) 600XL and 6600 Sonde multiprobes.

REAGENTS

1. Electrical conductivity standard solution – 1,000 *µS/cm*
2. pH standard solution – 7.0 (yellow)
3. pH standard solution – 10.0 (blue)
4. Turbidity standard solution – 0.0 NTU
5. Turbidity standard solution – 123 NTU or 11.2 NTU
6. Deionized (DI) water

EQUIPMENT

1. Sonde multiprobe
2. Field cable
3. MDS 650 display/data logger
4. Four Size "C" alkaline batteries (6600 Sonde only)

PROCEDURE - OPERATION

1. Before operating the instrument, calibrate it as described below.
2. If needed, attach the Sonde to the data display unit with the field cable.
3. Cover the probes with the perforated probe guard and submerge the probe end of the unit about a foot under the surface of the water to be measured. Alternately, attach the clear plastic calibration cup (cal cup) and pour environmental water into the cup until the probes are completely covered. Discard this water and repeat twice more before filling a final time.

4. To turn the on the display unit, press the green button (upper left). Use the up/down arrow key to select "Run" from the file menu. When selected, press "Enter" (←).
5. Wait for readings to stabilize: this should take less than a minute. If readings don't settle (and you are not taking measurements directly from the source), try holding the Sonde around the cal cup – this should stabilize the temperature and EC readings.
6. Record physical measurements in the Field Log Book (SOP#____) and on the Field Sheet (SOP #____).
7. When finished, turn the unit off by pressing the green button.
8. If making measurements over an extended time period, verify the instrument calibration every 8 hours. If measuring less than 8 hours, verification is not needed. Document the instrument verification on the Instrument Calibration Sheet.

General Procedure – Calibration and Calibration Verification

1. Before sampling, verify the instrument calibration for each physical constituent to be measured. If the calibration cannot be verified, the instrument must be recalibrated for that measurement. Since some calibrations are interdependent, perform verifications and calibrations in the following order:
   Specific conductance (EC)
   pH
   Dissolved oxygen (DO)
   Turbidity
   Depth
   Oxidation/reduction potential (ORP)
2. Attempt to verify the calibration.
3. If the calibration cannot be verified, calibrate as described for each measurement (below).
4. Document the verification and/or calibration on an "Instrument Calibration Sheet" (see SOP#____).

Conductivity (EC)

1. EC calibration is easy to do, so recalibrate even if the old calibration can be verified.
2. Pre-rinse the cal cup and sensors with a small amount of the 1.0 mS/cm (1,000 *µS/cm*) calibration standard and discard. Repeat. If 1,000 *µS/cm* standard is not available, it is OK to calibrate with standard ≥1.0 mS/cm.
3. Fill the cal cup with standard ensuring that the conductivity probe is completely submerged. The hole in the side of the probe must be under the surface of the solution and not have any trapped bubbles in the side opening.
4. Scroll to "Sonde Menu" and press "Enter"
5. Scroll to "Calibrate" press "Enter"
6. Scroll to "Spec. Cond" and press "Enter"
7. Type in "1" (if using 1,000 *µS/cm* standard) and press "Enter". The sonde requires the input in milli-siemens.
8. If the sonde should report "Out Of Range", investigate the cause. **Never override a calibration error message.** This error message can result from: 1) low fluid level, 2) air bubbles in the probe cell, and/or 3) an incorrect entry. For example, entering 1000 (for *micro*siemens) instead of 1.0 (for *milli*siemens) will result in an Out of Range error.
9. When prompted by the display unit, press "Enter" to accept the calibration.

10. After the calibration has been accepted, check the conductivity cell constant which can be found in the Sonde's Advanced Menu under Cal Constants. Record the value on the calibration sheet. If the cell constant is out of range (5.0 ± 0.45) the probe may need replacing.

pH

1. pH calibration is easy to do, so recalibrate even if the old calibration can be verified.
2. If necessary, attach a temperature probe to the Sonde (temperature is needed to measure pH).
3. If needed, go to the Sonde "Report Menu" and turn on the pH millivolt (mV) display. This will allow the Sonde to display the probe's raw output as well as pH units.
4. If the in-situ pH value is unknown, use a three point calibration. If the general pH range is known, bracket the anticipated value using a two point calibration.
5. Start all calibrations (two or three point) with yellow Buffer 7 standard solution.
6. Pre-rinse the cal cup and sensors with a small amount of the calibration standard and discard. Repeat.
7. Fill the cal cup with standard. Ensure that the pH probe is completely submerged.
8. Calibrate the pH as directed by the data display unit. Record the pH mV on the Calibration Sheet at each calibration point. The acceptance level for each buffer is:

Buffer	Millivolt Reading	Tolerance
4	180	± 50 mV
7	0	
10	180	

9. Determine the difference between the mv recorded for the 4 & 7 or the 7 & 10 calibration points. For example, if buffer 7 gave a 3 mV reading and buffer 10 gave a -177 mV reading, the difference is 180mV. The acceptable range for the mV difference is 165 to 180. If the mV difference is outside of this range, the pH probe should be replaced.
10. Do not use a probe that has given a "Calibration Error" or "Out of Range" message.
11. Recondition the probe if pH readings are slow to settle. The reconditioning procedure is in the "Sonde Care and Maintenance" section of the YSI manual.

Dissolved Oxygen (DO)

1. Attempt to verify the DO calibration (steps 2- 5, this section). If the calibration is good, don't recalibrate.
2. Put about ½ cm of water in the cal cup and set the lid on the cup. Don't tighten down the lid. Alternately, if the probe guard is on, wrap the guard in a moist towel. This will place the DO probe in a saturated atmosphere.
3. Go to the "Run" menu and press "Enter"
4. On the Calibration/Verification sheet, record the barometric pressure and the DO in %. If the DO reads between 95 and 105 % (at sea level), no calibration is needed.
5. If you are not at sea level, you must determine the acceptable DO range for your altitude.
6. If the calibration cannot be verified, inspect the DO probe anodes. If the anodes are not bright and shiny, remove the membrane and recondition using the 6035 reconditioning kit. If the o-ring looks loose or old, replace it as described in the YSI manual.

7. After replacing the membrane, allow the Sonde to run for 10 minutes. Check the DO Charge after about 5 minutes, it should read between 25 and 75.
8. After the 10 minute "burn-in", go to the Advanced Menu and confirm that the RS-232 auto sleep function is enabled. If the Sonde is to be connected to an SDI-12 data logger then the SDI-12 auto sleep must be enabled as well. After turning on auto sleep, wait one minute before proceeding.
9. Start the probe in the Discrete Run mode at a 4 second rate and record the first 10 DO% numbers on paper, the numbers must start at a high number and drop with each four second sample, example: 110, 105, 102, 101.5, 101.1, 101.0, 100.8, 100.4, 100.3, 100.1. It does not matter if the numbers do not reach 100%, it is only important that they have the same high to low trend. If you have a probe that starts at a low number and steadily climbs upward then the sensor has a problem and it must not be used. Note: Initial power up can make the first two DO% samples read low, the first two samples can be disregarded.
10. A new membrane will be slightly unstable for 3 to 6 hours after replacement so wait a few hours and then try again to verify your calibration.
11. If you still can't verify the calibration, calibrate by setting "auto sleep" ON for unattended studies and OFF for discreet sampling.
12. Fill the calibration cup as in Step 2. Let the DO probe sit idle, **not in "Run" mode,** in this saturated environment for at least 10 minutes before beginning the DO calibration.
13. Calibrate the Sonde in DO%.
14. Enter the local barometric pressure in mm/hg. In Unattended mode (RS-232 Auto-Sleep ON) the DO probe will be calibrated automatically once the barometric pressure is entered and the warm-up time counter counts down to zero.
15. For "Discrete" or "Sampling" modes, press the Enter Key when the DO readings are stable. Wait at least three minutes and press the enter key again to calibrate.
16. When the calibration is complete, go to the "Advanced" menu and then to "Cal Constants". Record the DO gain on the Calibration Sheet. The gain should be between -0.7 and +1.4.

Turbidity (6600 only)

Notes: The calibration of all YSI turbidity sensors must be done with either YSI distributed standards, Hach StablCal, Diluted Hach 4000 NTU formazin or standards that have been prepared according to instructions in Standard Methods (Section 2130B). Standards from other vendors are NOT approved, and their use will likely result in a bad calibration and incorrect field readings. Please refer to the turbidity calibration section of your manual for more information.

Calibrating turbidity is best done in a lab. It is better to post-calibrate an optical probe back in the lab than to attempt a field calibration, especially if you are working out of a small boat or in less than clean conditions.

Never override a calibration error message without fully understanding the cause of the problem. Calibration errors messages usually indicate that problems exist that will result in incorrect field readings.

1. Before calibrating or verifying calibration, confirm that 1) the wiper on the turbidity probe is parking approximately 180 degrees opposite of the optics, 2) the wiper reverses

direction during the wipe cycle, 3) the probe output increases when a finger is placed in front of the optics, 4) all submerged parts of the sonde and wipers are clean and 5) the optics are clean and clear of fingerprints.

2. Remove the EDS wiper and replace it with a clean standard (no brush) wiper.
3. Start with the zero (0) NTU standard. Pour the 0 NTU standard into the calibration cup – pour down the side to avoid aerating the sample. Set the Sonde on top of the calibration cup, do not engage the threads. Verify that there are no air bubbles on the probe face.
4. Run the wiper at least once before accepting the first point. To accept the point, press "Enter".
5. Calibrate the second point with 123 NTU standard (for the 6136 sensor). Wipe the probe at least once, then press "Enter".

Depth

Note: To calibrate, the depth sensor module must be in air and the sensor channel must be free of dirt. If the channel needs cleaning, use a syringe to flush water through it.

1. From the Calibration menu, select Pressure-Abs or Pressure-Gage (depending if you have a vented level sensor).
2. Input 0.00 or some known offset in feet. Press Enter and monitor the stabilization of the depth readings with time.
3. When no significant change occurs for approximately 30 seconds, press Enter to confirm calibration. This zeros the sensor with regard to current barometric pressure. Then press Enter again to return to the Calibration menu.
4. Go to the "Advanced" menu and then to "Cal Constants" and record the pressure offset on the Calibration Sheet.

CALIBRATION CHART

Temperature Celsius	Zobell Solution Value, mV
-5	270.0
0	263.5
5	257.0
10	250.5
15	244.0
20	237.5
25	231.0
30	224.5
35	218.0
40	211.5
45	205.0
50	198.5

EMPLOYEE SAFETY

1. Handle standards with care; do not ingest.

POLLUTION PREVENTION AND WASTE MANAGEMENT

1. Place used batteries in recycle bin at the 112 lab. Tape battery ends before binning them.

Appendix B: 2008 CVO Water Delivery Tables 24, 25, and 26

The following are the water delivery tables from calendar year 2008. Names highlighted in red are used in the Grassland SubArea calculations. Names highlighted in blue are used in the Northwest SubArea calculations. Names highlighted in purple are used in both SubArea calculations.

Table 24

U.S. Department of Interior - Bureau of Reclamation
Central Valley Operations Office

San Joaquin and Mendota Pool
2008

Monthly Deliveries in AF

Water User	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Fresno Slough WD	0	18	80	97	437	156	276	54	0	0	0	0	1118
Tranquility Public Utilitie	0	0	13	0	0	27	33	29	0	0	0	0	102
James ID	28	4515	487	612	2459	5418	3747	1945	936	224	84	0	20455
Meyers (SLWD)	619	1216	1242	583	147	113	256	825	987	61	226	0	6275
Dudley & Indart (formerly C	15	159	117	176	165	220	217	225	39	63	1	0	1397
Mid-Valley WD (no contract)	0	0	0	0	0	0	0	0	0	0	0	0	0
Reclamation District #1606	0	14	51	52	118	134	73	11	0	0	0	0	453
Terra Linda Farms (Coelho F	284	585	746	758	1066	1473	1533	1053	470	245	55	0	8268
Tranquility ID	0	2197	2631	2565	4585	6372	6372	2943	1082	365	500	0	29612
Westlands WD (Lateral 6 & 7	0	0	0	0	0	84	316	84	363	0	0	0	847
Wilson, JW (no contract)	0	82	107	0	0	208	233	272	76	0	0	0	978
Laguna WD (via CCID)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
San Luis WD (via CCID)	**0**	**82**	**20**	**0**	**50**	**40**	**45**	**37**	**0**	**0**	**0**	**0**	**274**
Total	946	8868	5494	4843	9027	14245	13101	7478	3953	958	866	0	69779
Exchange Contractors													
Central California ID (CCID	**0**	**17424**	**44627**	**27615**	**54252**	**48941**	**64554**	**51418**	**29618**	**29935**	**1801**	**0**	**370185**
Columbia Canal Co	**0**	**1628**	**4975**	**5278**	**6701**	**7940**	**8735**	**8799**	**6420**	**3500**	**46**	**0**	**54022**
Firebaugh Canal WD	**426**	**3979**	**3902**	**5629**	**5221**	**6150**	**5431**	**5541**	**3259**	**2071**	**1665**	**916**	**44190**
San Luis Canal Co (SLCC)	**0**	**3913**	**11387**	**14426**	**14064**	**24935**	**27450**	**24210**	**6102**	**2000**	**2750**	**0**	**131237**
Total	426	26944	64891	52948	80238	87966	106170	89968	45399	37506	6262	916	599634
Refuges													
Grasslands WD (via CCID & S	**4892**	**4280**	**500**	**303**	**3410**	**897**	**146**	**400**	**19765**	**9649**	**10173**	**0**	**54415**
China Island Unit (CDFG) (v	**647**	**803**	**151**	**119**	**101**	**70**	**195**	**174**	**1046**	**884**	**1008**	**0**	**5198**
Los Banos WMA (CDFG) (via C	**1759**	**944**	**341**	**233**	**272**	**99**	**144**	**518**	**3218**	**4590**	**2447**	**0**	**14565**
Mendota Wildlife Area (CDFG	556	1149	1479	1317	1776	1864	2817	1338	5259	5863	2678	693	26789
Salt Slough Unit (CDFG) (vi	**835**	**605**	**173**	**144**	**220**	**122**	**134**	**151**	**1381**	**1577**	**1208**	**0**	**6550**
Freitas Unit (USFWS) (via C	**1069**	**1106**	**256**	**181**	**173**	**89**	**0**	**0**	**968**	**1865**	**1396**	**0**	**7103**
Kesterson (USFWS) (via CCID	**0**	**662**	**197**	**108**	**108**	**22**	**0**	**0**	**0**	**0**	**1164**	**0**	**2261**
San Luis NWR (USFWS) (via S	**3708**	**9295**	**1749**	**0**	**2840**	**0**	**0**	**0**	**5822**	**4136**	**2994**	**0**	**30544**
													0
Total	13466	18844	4846	2405	8900	3163	3436	2581	37459	28564	23068	693	147425
Total Deliveries	14838	54656	75231	60196	98165	105374	122707	100027	86811	67028	30196	1609	816838

* Delivery data is based on District turn-out readings and may include water in addition to water service contract deliveries.

Table 25

U. S. Department of Interior - Bureau of Reclamation
Central Valley Operations Office

Delta-Mendota Canal
2008

Monthly Deliveries in AF

Water User	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Tracy, City of	277	0	0	415	736	942	1,045	1,003	903	849	472	349	6,991
Byron Bethany ID (formerly P	13	9	52	455	621	564	510	423	350	241	46	21	3,305
West Side ID	0	0	0	402	263	255	371	43	0	0	0	0	1,334
Banta Carbona ID	**0**	**0**	**0**	**431**	**222**	**133**	**727**	**473**	**0**	**1**	**0**	**0**	**1,987**
West Stanislaus ID	**0**	**41**	**766**	**2,884**	**2,028**	**2,934**	**3,584**	**3,917**	**1,610**	**0**	**0**	**0**	**17,764**
Patterson WD	**11**	**400**	**35**	**210**	**602**	**910**	**1,000**	**1,010**	**1,458**	**567**	**72**	**0**	**6,275**
Del Puerto WD	**44**	**199**	**4,484**	**8,506**	**9,448**	**8,503**	**8,893**	**9,228**	**5,389**	**2,907**	**1,030**	**305**	**58,936**
San Luis WD - Ag	**0**	**238**	**717**	**597**	**566**	**863**	**1,273**	**747**	**359**	**172**	**30**	**60**	**5,622**
San Luis WD - M&I	**1**	**1**	**2**	**16**	**19**	**23**	**19**	**1**	**33**	**14**	**6**	**1**	**136**
Panoche WD - Ag	**65**	**112**	**956**	**655**	**845**	**869**	**768**	**663**	**209**	**107**	**181**	**62**	**5,492**
Panoche WD - M&I	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**24**
Eagle Field WD	**31**	**0**	**0**	**0**	**1**	**0**	**13**	**72**	**1**	**1**	**0**	**0**	**119**
Oro Loma WD	**0**	**56**	**0**	**0**	**10**	**22**	**17**	**28**	**0**	**0**	**0**	**0**	**133**
Mercy Springs WD	**0**	**0**	**92**	**108**	**194**	**95**	**162**	**71**	**155**	**207**	**1**	**18**	**1,103**
Newman Wasteway Recirculatio	**0**	**0**	**0**	**0**	**0**	**0**	**1,065**	**13,439**	**7,089**	**0**	**0**	**0**	**21,593**
DWR Intertie @MP7.70-R	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	444	1,058	7,106	14,681	15,557	16,115	19,449	31,120	17,558	5,068	1,840	818	130,814
Exchange Contractors													
Central California ID (Abv C	**0**	**32**	**1,209**	**1,642**	**2,358**	**2,121**	**1,855**	**2,156**	**1,577**	**949**	**321**	**781**	**15,001**
Central California ID (Blw C	**407**	**971**	**8,821**	**7,146**	**12,240**	**19,949**	**27,083**	**26,621**	**456**	**183**	**100**	**0**	**103,977**
Firebaugh Canal Co	**129**	**248**	**353**	**405**	**1,955**	**2,483**	**3,916**	**1,992**	**62**	**0**	**61**	**6**	**11,610**
Total	536	1,251	10,383	9,193	16,553	24,553	32,854	30,769	2,095	1,132	482	787	130,588
Refuges													
China Island Unit (CDFG) (76	**0**	**0**	**452**	**357**	**302**	**212**	**585**	**524**	**0**	**0**	**0**	**1,176**	**3,608**
Los Banos WMA (CDFG) (76.05	**0**	**0**	**485**	**698**	**818**	**296**	**432**	**720**	**0**	**0**	**0**	**837**	**4,286**
Salt Slough Unit (CDFG) (76.	**0**	**0**	**519**	**432**	**659**	**366**	**401**	**453**	**0**	**0**	**0**	**915**	**3,745**
Volta WMA (CDFG) (Volta Wast	156	421	0	62	370	260	25	1,911	2,588	2,756	1,516	183	10,248
Grasslands WD (76.05 & CCID)	**1,051**	**5,990**	**1,500**	**910**	**8,857**	**2,691**	**438**	**1,199**	**21,551**	**12,744**	**7,617**	**500**	**65,048**
Grasslands WD (Volta Wastewa	**10**	**748**	**0**	**360**	**3,740**	**980**	**0**	**283**	**17,003**	**11,759**	**1,014**	**312**	**36,209**
Kesterson Unit (USFWS) (76.0	**0**	**0**	**591**	**324**	**324**	**66**	**0**	**0**	**0**	**0**	**0**	**828**	**2,133**
Kesterson Unit (USFWS) (Volt	**616**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**942**	**1,523**	**0**	**0**	**3,081**
Frietas Unit (USFWS) (76.05	**0**	**0**	**767**	**542**	**518**	**267**	**0**	**0**	**0**	**0**	**0**	**886**	**2,980**
Total	1,833	7,159	4,314	3,685	15,588	5,138	1,881	5,090	42,084	28,782	10,147	5,637	131,338

Table 26

U. S. Department of Interior - Bureau of Reclamation
Central Valley Operations Office

San Luis and Cross Valley Canals
2008

Monthly Deliveries in AF

Water User	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SAN LUIS CANAL													
City of Avenal	194	191	213	202	193	169	169	171	133	252	202	173	2262
City of Coalinga	324	310	369	537	626	671	796	715	672	648	381	432	6481
City of Dos Palos	**130**	**107**	**109**	**123**	**149**	**172**	**182**	**174**	**143**	**115**	**75**	**36**	**1515**
City of Huron	66	61	90	125	114	116	127	127	110	106	88	56	1186
Pacheco WD	**1**	**1**	**237**	**1**	**1**	**765**	**1003**	**652**	**318**	**1**	**22**	**53**	**3055**
Pacheco CCID Non-project (Hamburg)	**96**	**772**	**1109**	**1494**	**1346**	**806**	**0**	**0**	**0**	**142**	**116**	**0**	**5881**
Panoche WD	106	1224	3318	4872	5054	4883	4887	2106	1175	874	343	327	29169
San Luis WD	**586**	**3467**	**5472**	**7150**	**9017**	**8930**	**10490**	**6827**	**3812**	**4712**	**2703**	**28**	**63194**
Westlands WD	5588	23834	60024	76747	97166	81129	83558	61458	35231	25309	10161	5754	565959
Mendota WMA (CDFG) (via WWD Lateral	0	0	0	28	0	1	31	1	1	0	0	0	62
Mendota WMA (CDFG) (via WWD Lateral	0	0	0	0	0	0	0	0	0	0	0	0	0
Kern National Wildlife Refuge (USFW	489	2266	0	0	276	0	0	1562	3949	3640	4857	4154	21193
													0
Total	7580	32233	70941	91279	113942	97642	101243	73793	45544	35799	18948	11013	699957
O'NEILL FOREBAY DELIVERIES													
Oneill Forebay Wildlife	**138**	**31**	**0**	**0**	**14**	**147**	**79**	**108**	**140**	**148**	**84**	**100**	**989**
San Luis WD Ag	**38**	**274**	**675**	**666**	**834**	**759**	**1225**	**734**	**404**	**346**	**151**	**100**	**6206**
San Luis M&I	**41**	**42**	**92**	**93**	**153**	**168**	**81**	**113**	**107**	**81**	**53**	**33**	**1057**
VA Cemetary	**1**	**1**	**14**	**20**	**37**	**30**	**30**	**25**	**24**	**13**	**5**	**5**	**205**
Total	218	348	781	779	1038	1104	1415	980	675	588	293	238	8457
CROSS VALLEY CANAL (See Note 1 below)													
County of Fresno	0	0	0	0	0	0	152	272	776	0	0	0	1200
County of Tulare	0	0	0	0	0	0	123	0	1072	928	0	0	2123
Lower Tule River ID	0	0	0	0	0	0	2026	3212	1998	1083	307	96	8722
Pixley ID	0	0	0	0	0	0	2027	3212	1997	1083	307	96	8722
Kern-Tulare WD	0	0	0	0	0	0	0	3541	12459	0	0	0	16000
Rag Gulch WD	0	0	0	0	0	0	0	249	5071	0	0	0	5320
Hills-Valley ID	0	0	0	0	0	0	169	309	860	0	0	0	1338
Tri-Valley ID	0	0	0	0	0	0	58	107	292	0	0	0	457
Total	0	0	0	0	0	0	4555	10902	24525	3094	614	192	43882

* Delivery data is based on District turn-out readings and may include water in addition to water service contract deliveries.
Note 1: Cross Valley Canal section represents deliveries on behalf of the contractors listed, not necessarily what flows went into the Cross Valley Canal.

Appendix C: Sample Quarterly Report (4th Quarter 2008)

Quarterly Activity Report

October 1 – December 31, 2008

In compliance with the "Management Agency Agreement between the Central Valley Regional Water Quality Control Board and the United States Bureau of Reclamation" executed on December 22, 2008

February 15, 2009

Abbreviations and Acronyms

Action Plan	Actions to Address the Salinity and Boron TMDL Issues for the Lower San Joaquin River
AF	acre-foot or acre-feet
Authority	San Luis & Delta-Mendota Water Authority
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition
BMP	Best Management Practices
CALFED	CALFED Bay-Delta Program
CDEC	California Data Exchange Center
CDFG	California Department of Fish and Game
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
CVO	Central Valley Operations
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long Term Sustainability
DCRT	Data Collection and Review Team
DMC	Delta-Mendota Canal
DWR	California Department of Water Resources
EC	electrical conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
Exchange Contractors	San Joaquin River Exchange Contractors Water Authority
GBP	Grassland Bypass Project
GDA	Grassland Drainage Area
GRCD	Grassland Resource Conservation District
GUI	graphical user interface
ID	irrigation district
Interior	U.S. Department of the Interior
IPO	Interim Plan of Operations
MAA	Management Agency Agreement
µS/cm	micro Siemens per centimeter
µg/L	microgram(s) per liter
mg/L	milligram(s) per liter

NPDES	National Pollutant Discharge Elimination System
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
Reclamation	Bureau of Reclamation
RTMP	Real Time Management Program
Secretary	Secretary of the Interior
Service	U.S. Fish and Wildlife Service
SJR	San Joaquin River
SJRIP	San Joaquin River Improvement Project
SJRWQMG	San Joaquin River Water Quality Management Group
SLDMWA	San Luis and Delta Mendota Water Authority
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TDS	total dissolved solids
TMDL	total maximum daily load
TPRT	Technical Policy and Review Team
VAMP	Vernalis Adaptive Management Plan
WAP	Water Acquisition Program
WCFSP	Water Conservation Field Service Program
WDR	Waste Discharge Requirement
WQO	water quality objective
WRDP	Westside Regional Drainage Plan
YSI	Yellow Spring Instrument

Purpose

The Central Valley Regional Water Quality Control Board's Salt and Boron Total Maximum Daily Load (TMDL) was approved and placed into effect on July 28, 2006. In response to the Salinity and Boron TMDL, the United States Bureau of Reclamation (Reclamation) developed a salinity control plan, *Actions to Address the Salinity and Boron TMDL Issues for the Lower San Joaquin River* (Action Plan) and entered into a Management Agency Agreement (MAA) with the Central Valley Regional Water Quality Control Board on December 22, 2009. The MAA describe the actions Reclamation will take to meet the obligations allocated to it by the Salinity and Boron TMDL for the lower San Joaquin River. The MAA states:

> Reclamation will submit quarterly reports to the Regional Water Board by 45 days after the end of the calendar quarter. The quarterly reports will include a summary of activities conducted by Reclamation during the quarter in conjunction with each element included in their Action Plan, including activities related to developing a Real Time Management Program. In addition Reclamation will include data collected relevant to DMC load evaluation.

The "Quarterly Activity and Monitoring Report" summarizes the activities conducted by the Reclamation in conjunction with each element outlined in its salinity control plan for the lower San Joaquin River. The Action Plan describes Reclamation's past, current and planned practices and procedures to mitigate and manage adverse impacts of salt and boron imported into the San Joaquin basin via the Delta Mendota Canal (DMC) in order to help achieve compliance with the objectives contained in the Regional Water Board's *Water Quality Control Plan for the Sacramento River and the San Joaquin River Basins – 4th Edition* (Basin Plan).

Organization of Quarterly Report

The quarterly report will provide a synopsis of the various activities associated with each element identified in the Action Plan. The Action Plan describes all of the actions contemplated by the MAA. Within the Action Plan, actions are divided into three major categories: Flow, Salt Load Reduction, and Mitigation. For each action a brief description and list of activities are identified. The quarterly report will include calculations of salt loads based on DMC deliveries and calculations of assimilative capacity provide through dilution flows. The calculation methods used in this report are provisional and some elements in this report (such as the Westside Regional Drainage Plan) does not include estimations of benefits at this time. Reclamation is in the process of developing the *Compliance Monitoring and Evaluation Plan* which will outline the criteria and methodology for determining DMC loads and credits.

A. Flow Actions

Reclamation has agreed to provide mitigation and dilution flows to meet the Vernalis salinity and boron objectives. Historically, Reclamation has provided dilution flows from the New Melones Project and through purchases for the Vernalis Adaptive Management Plan. Flow actions include: dilution flows from New Melones and water acquisitions.

1. New Melones flows

Brief Description: In the Flood Control Act of October, 1962, the Congress reauthorized and expanded the New Melones project (P.L. 87-874) to a multipurpose unit to be built by the U.S. Army Corps of Engineers (Corps) and operated by the Secretary of Interior as part of the Central Valley Project (CVP), thus creating the New Melones Unit. The multipurpose objectives of the unit include flood control, irrigation, municipal and industrial water supply, power generation, fishery enhancement, water quality improvement, and recreation. New Melones Reservoir is currently operating under an "Interim Operating Agreement." This agreement was completed in 1996 with significant input from stakeholder interests.

Activity:

- *Working to develop a process to efficiently obtain the operations data on a routine basis for future reports.*

Month	*Volume of Releases (cfs)* [12]	*Volume of Releases (AF/month)*	*Volume of Releases (TAF/month)*	*Monthly Average EC (µS/cm)* [13]	*Assimilative Capacity (tons/month)*
Oct-08	12453	24657	25	86	18690
Nov-08	7573	14995	15	91	11304
Dec-08	7454	14759	15	97	11057
Quarterly Total	27480	54410	54		41050

For the quantification of dilution flow allocations, the Basin Plan prescribes the following equation [14] to calculate assimilative capacity. The TMDL specifies that entities providing dilution flows obtain an allocation equal to the salt load assimilative capacity provided by this flow, calculated as follows:

Adil = Qdil*(Cdil--WQO)*0.8293

Where:

Adil = dilution flow allocation in thousand tons of salt per month
Qdil = dilution flow volume in thousand acre-feet per month
Cdil = dilution flow electrical conductivity in µS/cm
WQO = salinity water quality objective for the LSJR at Airport Way Bridge near Vernalis in µS/cm

2. Water Acquisitions

Brief Description: The Central Valley Project Improvement Act (CVPIA), signed into law on October 30, 1992, modified priorities for managing water resources of the Central Valley Project. CVPIA altered the management of the Central Valley Project to make

[12] Flow data obtained from CVO Office; non-consumptive releases from Goodwin Dam
[13] Water quality data obtained from California date Exchange Center (CDEC); Ripon (RPN) monitoring station.
[14] Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition; Page IV-32.07, Table IV-4.4 Summary of Allocations and Credits

fish and wildlife protection, restoration, and enhancement as project purposes having equal priority with agriculture, municipal and industrial, and power uses. To meet water acquisition needs under CVPIA, the U.S. Department of the Interior (Interior) has developed a Water Acquisition Program (WAP), a joint effort by the Reclamation and the U.S. Fish and Wildlife Service (Service). The program's purpose is to acquire water supplies to meet the habitat restoration and enhancement goals of the CVPIA and to improve the Interior's ability to meet regulatory water quality requirements.

Activity:
- *Provided fall pulse flow releases in October 2008.*
- *Working to develop a process to efficiently obtain the water acquisitions information on a routine basis for future reports.*

Month	***Volume Acquired***[15]	***Source***	***Volume of Releases (TAF/month)***	***Monthly Average EC (µS/cm)***[16]	***Assimilative Capacity***[17] ***(thousand tons/month)***
Oct-08	12500	Merced R. [18]	12.5	87 [19]	9460
Nov-08	0	-	-	-	-
Dec-08	0	-	-	-	-
Quarterly Total	12500				9460

B. Salt Load Reduction Actions

Reclamation is under a court order to provide drainage to its San Luis Unit, on the Westside of the lower San Joaquin River. As part of its efforts to provide drainage, Reclamation has historically supported the Westside Regional Drainage Plan (WRDP) through monetary grants and in-kind services. Reclamation recognizes there is still much to be done to implement the Westside Regional Drainage Plan. Salt Load Reduction Actions include the Grasslands Bypass Project, the Westside Regional Drainage Plan, and conservation programs (Water Conservation Field Services Program, Water 2025 Grants Program, and the CALFED Water Use Efficiency Program).

1. Grasslands Bypass Project (GBP)

Brief Description: The Grassland Bypass Project is a multi-agency stakeholder project based upon an agreement between the Reclamation and the Authority to use a 28-mile

[15] Water acquisition data obtained from MP-400, Water Acquisitions Group
[16] Average electrical conductivity data obtained from CDEC; monitoring station dependent upon location of acquired water.
[17] Same formula used as cited on page 2 of this report. Formula taken from *Water Quality Control Plan for the Sacramento and San Joaquin River Basins, 4th Edition*; Page IV-32.07, Table IV-4.4 Summary of Allocations and Credits
[18] 12500 AF was acquired from the San Joaquin River Group Authority from October 1-24.
[19] Average electrical conductivity data obtained from CDEC; Merced River at Stevinson (MST) monitoring station.

segment of the San Luis Drain. The San Luis Drain is used to convey agricultural subsurface drainage water from the Grassland Discharge Area (GDA) to Mud Slough, a tributary of the San Joaquin River. The purpose of the project is to separate unusable agricultural drainage water discharged from the GDA from wetland water supply conveyance channels, facilitate drainage management that maintains the viability of agriculture in the GDA and promotes continuous improvement in water quality in the San Joaquin River.

Activity:

- *Reclamation continues to support portions of sediment and water monitoring effort necessary for the project. These include weekly, quarterly and annual monitoring of locations in the San Luis and Kesterson National Wildlife Refuges, Mud Slough, Salt Slough, DMC, Mendota Pool, and the San Luis Drain. Activities include collection of samples, incorporation of samples into a prescribed QA/QC program, fund analytical analyses, validation of analytical data, periodic update of the Quality Assurance Project Plan, and routine QA audits of all analytical laboratories performing work on the project.*
- *Reclamation is actively involved with project partners to pursue a third use agreement to fully develop the project. The administrative draft EIS/EIR for the continuation of the Grassland Bypass Project went out for public review in December 2008. This document will be used to support an amendment to the Basin Plan*
- *Reclamation continues to be a member of the Technical Policy Review Team (TPRT) and the Data Collection and Reporting Team (DCRT). The DCRT produces the Annual Report and help revise the Quality Assurance Project Plan. The TPRT is responsible for tracking the monitoring program carried out by the various agencies.*

2. Westside Regional Drainage Plan (WRDP)

Brief Description: The Westside Regional Drainage Plan is a local stakeholder program developed by integrating all consistent elements of drainage management developed by government and local agencies and private partnerships. The original efforts of the WRDP focused on reducing selenium discharges to the San Joaquin River. Success of the original effort prompted a proposal to expand the WRDP 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 WRDP, Reclamation provides annual funding to support and sustain the WRDP.

Activity:

- *In 2008, Reclamation provided $4 million in funding to the WRDP. Combined with state Proposition 50 funding and local cost sharing, the funds have been used to develop more than 6,000 acres of reuse lands. Funds were used to install facilities to collect and distribute drain water across the reuse area, remove and replace open drain ditches that were hazardous to waterfowl, and line earth canals with concrete to reduce seepage losses. Funds were also used for the EIS/EIR required for the continuation of the Grassland Bypass Project, a critical part of the WRDP, after 2010.*

3. Conservation Efforts

Brief Description: The water use efficiency program element includes several grant programs which fund actions to assure efficient use of existing and any new water supplies. Efficiency actions can alter the pattern of water diversions and reduce the magnitude of diversions, providing additional benefits. Efficiency actions can also result in reduced discharge of effluent or drainage and improved water quality. Although Reclamation is unable to quantify the benefits of the various funded projects as related to salinity reduction, the following information is provided to depict the agency's water conservation efforts in the basin. Through Water 2025, CALFED, and the WCFSP, Reclamation has awarded 36 projects in the San Joaquin Valley that require performance measures since 2006. As information is collected from these projects quantifiable benefits may be determined in the future.

Activity:

- *In 2008, the Water Conservation Field Service Program and the CALFED Water Use Efficiency Program received 44 proposals and funded 21 proposals. Of the 21 proposals granted funding, 7 were in the San Joaquin Basin totaling approximately $275,000.*
- *In 2008, the Water 2025 Grant Program received 68 proposals and provided Federal cost share funding to 3 proposals. Of the 3 proposals that received funding, 2 were in the San Joaquin Basin totaling $600,000.*
- *Reclamation extended a $433,000 contract to 2011 with the Agricultural Water Management Council to promote and advance effective water management practices to meet the water conservation goals and best management practices.*

C. Mitigation Actions

Reclamation's Action Plan identifies two mitigation actions to reduce salinity loads: a real time management program to maximize the removal of salt using assimilative capacity in the San Joaquin River, and a wetlands BMP plan to research and potentially develop practices to reduce salinity loading from managed wetlands. Reclamation has actively supported the development of a real time monitoring and forecasting program in the River and in managed wetlands.

1. Real Time Management Program – Development of Stakeholder-Driven Program

Brief Description: The Real Time Management Program is described in the TMDL as a stakeholder driven effort to use "real-time" water quality and flow monitoring data to support water management operations in order to maximize the use of assimilative capacity in the San Joaquin River. The Regional Board describes this assimilative capacity as up to 80% of the load determined by Vernalis salinity objective. Reclamation has contracted with a facilitation firm to support the development of a stakeholder-driven program.

Activity:

- *Executed a contract to procure the service of a consultant to facilitate stakeholder involvement in developing a Real Time Management Program (RTMP)*
- *Directed a consultant to develop and conduct a stakeholder survey to solicit feedback on the RTMP process and garner suggestions on salinity management in the basin.*
- *Conducted several coordinating and planning meetings to develop and prepare for the first stakeholder workshop held on January 8, 2009.*

<u>2. Real Time Management Program</u> – Technical Support

Brief Description: A successful RTMP will require a real time monitoring network and a model capable of reasonably accurate forecasting of assimilative capacity. Reclamation is committed to participation in and support of the development of these tools. Reclamation staff has valuable experience in both of these areas. The technical support of this program will follow the stakeholder process.

Activity:

- *Executed a contract to procure the service of a consultant to develop a graphical user interface (GUI) and water quality data management tool.*
- *Executed a contract to purchase three YSI multi-parameter environmental monitoring probes to be used with the existing monitoring network on the lower San Joaquin River.*
- *Executed a contract to purchase a software package that will be used to evaluate and perform quality control and quality assurance validation on time series data collected on the San Joaquin River.*

<u>3. Wetlands BMP Plan</u>

Brief Description: The Service, CDFG, 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. Currently, the developed draft BMP plan is awaiting the Service's approval.

Activity:

- *Reclamation is sponsoring a project entitled "Water Quality Monitoring in the Grassland Resource Conservation District". Through this project a contract was executed to retrofit six monitoring stations located in the Grassland Water District and California State Fish and Game wetlands and an agreement is in place to maintain 28 real time monitoring sites associated with a pilot study in the Grassland Resource Conservation District.*
- *Reclamation is working with the Service, CDFG, and local wetlands managers to finalizing the BMP Plan.*
- *Reclamation is working on a contract to purchase additional monitoring equipment to develop a real time monitoring network on managed wetlands.*

4. Involvement in CV-SALTS program

Brief Description: The Central Valley Water Board and State Water Board have initiated a comprehensive effort to address salinity problems in California's Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity management program. The goal of CV-SALTS is to maintain a healthy environment and a good quality of life for all Californians by protecting the state's most essential and vulnerable resource: water.

Activity:

- *Reclamation is involved in the various sub-committees in the program – Leader Group, Technical Advisory Committee, Economics, Education and Outreach.*

D. DMC Load Evaluation

The calculated DMC load is determining by the volume of deliveries made to the Northwest and Grassland subareas and the corresponding TDS. The summary data tables below are taken from the monthly report titled *Delta-Mendota Canal Water Quality Monitoring Program.*

Loads of salt delivered to the Grasslands Subareas through CVP water [20]

	October	November	December	Quarterly Total
EC [21] (µS/cm)	502	460	745	
TDS [22] (mg/L)	326	299	484	
Cal. Salt Load [23] (tons)	40810	16250	5070	62130
Supply Allocation [24]	6487	2818	542	9847

[20] Table 9b, *Delta Mendota Canal Water Quality Monitoring Program for Selenium, Salinity and Boron,* Reclamation
[21] Flow weighed EC calculated as follows: (Sum of (daily flow * specific conductance of daily sample))/(Sum of daily flows when samples collected)
[22] The TDS value is flow weighed and calculated as follows: (Sum of (daily flow * TDS of daily sample))/(Sum of daily flows when samples collected)
[23] Salt load (tons) =Total Flow (acre-feet) * total dissolved solids (mg/L) * 0.00136

(tons)				
Excess Load (tons)	34323	13432	4528	52283

Loads of salt delivered to the Northwest Subareas through CVP water [25]

	October	November	December	Quarterly Total
EC [10] (µS/cm)	509	525	743	
TDS [11] (mg/L)	331	341	483	
Cal. Salt Load [12] (tons)	3130	580	320	4030
Supply Allocation [13] (tons)	490	89	35	614
Excess Load (tons)	2640	491	285	3416

E. Reporting Requirements

In the MAA, Reclamation agreed to provide quarterly reports to the Regional Board. Reclamation will consult with the Regional Board before proposing any changes to the sample report format. Quarterly reports are due 45 days after the end of the calendar quarter:

End of calendar quarter	Due date of Quarterly report
Dec 31, 2008	Feb 15, 2009
March 31, 2009	May 15, 2009
June 30, 2009	August 15, 2009
September 30, 2009	November 15, 2010
December 31, 2009	February 15, 2010
March 31, 2010	May 15, 2010
June 30, 2010	August 15, 2010
September 30, 2010	November 15, 2010
December 31, 2010	February 15, 2011

F. Funding Reporting

Reclamation agreed in the MAA to seek additional funding, including grant funding, to support salinity control efforts. In its quarterly reports, Reclamation will report on its efforts to support the securing of additional funding.

Activity:

- *A funding request was submitted for the 2011 budget for administrative coordination and activities related to the RTMP.*

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[24] Supply Water Allocation Salt Load (tons) = LADMC = QDMC * 85 µS/cm * 0.8293
LADMC = DMC load allocation (1000 tons/month)
QDMC = Volume of water delivered from the DMC to the subarea (1000 acre-feet/month)
85 µS/cm = Background specific conductance of water from the Sierra Nevada
from Page IV-32.07 of the Basin Plan

[25] Table 10b, *Delta Mendota Canal Water Quality Monitoring Program for Selenium, Salinity and Boron,* Reclamation