Details on All DWQP Priorities/Actions

Institutional & Program Management

Coordination

- Coordinate Basin Planning Process among implementing agencies

Maximize the use of the basin planning process to integrate implementation of the CWA, SDWA, Porter-Cologne water pollution control act and CALFED Water Quality Program Plan. A working group should be formally established and adequately funded to encourage coordination among the RWQCB, DHS and other CALFED implementing agencies.

From NGT pp. 41 *Milestone:*

Constituent Region

Bundled Link to Other Program(s)

Current Status:

- Develop Compliance Plan for Bay-Delta Standards

This ROD commitment has been interpreted to include only the Vernalis and interior South Delta Standards in the 1995 Bay-Delta Water Quality Control Plan. The DWR and USBR October 2000 briefing paper and the March 2002 update by USBR cite the South Delta Barriers, the RWQCB and other San Joaquin Valley source control efforts, and recirculation as the required solution to this problem. More recently, the water quality element of the Delta Improvements Package expands this interpretation to address the Contra Costa Canal standards and dissolved oxygen standards in the Stockton Deepwater Ship Channel

From ROD *Milestone:* September 2002

Constituent Salinity, DO Region San Joaquin, Delta

Bundled Link to Other Program(s)

Current Status: The Delta Improvements Package is under development. Details that still need to be worked out include a complete plan for SJV salinity, in-Delta salinity standards, and agency responsibility.

- Develop JPA for drinking water quality data acquisition

Develop a Joint Powers Authority (JPA) that focuses on drinking water quality data acquisition, coordination, management, and dissemination.

From NGT pp. 24 *Milestone:*

Constituent Region

Bundled Link to Other Program(s)

Current Status:

- Establish administrative accountability and reporting measures for agency integration and collaboration

Establish administrative accountability and reporting measures to encourage collaboration among staff of state and federal CALFED agencies. Accountability and reporting measures should require coordination and integration among different CALFED agencies to ensure that CALFED DWQP goals are being met, continuously reviewed and updated as necessary.

From NGT pp.46 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Manage ecosystem restoration projects for water quality

Manage ecosystem restoration projects to minimize adverse impacts and maximize benefits for drinking water quality. CALFED should locate restoration projects to avoid or reduce water quality impacts at drinking water intakes.

From WQPP pp. 3-14 *Milestone:*
Constituent organic carbon, salinity Region Delta
Bundled Link to Other Program(s)
Current Status:

- Participate in CALFED Science Program activities

Participate in the CALFED Science Program activities, including the Independent Science Board and annual Science conference planning activities, to ensure consideration of Drinking Water Quality Program science needs and questions.

From DWQP Program Plan, DWS *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Funding/Resources

- Coordinate funding criteria among DWQP implementing agencies

Agencies with grant/other funding responsibilities should consider the CALFED DWQP objectives in their criteria and selection processes for RFPs.

From NGT pp. 46 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop community participation and education guidelines

Develop requirements for community participation and education in funded projects, with an emphasis on reaching vulnerable communities

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop guidelines for environmental justice (EJ) analysis and assessment of projects

Work with the BDPAC Environmental Justice Subcommittee to develop parameters of EJ analysis required for funding projects at or above $1 million, and EJ assessment guidelines for funding projects under $1 million.

From EJ Subcom *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Study concept of water quality improvement fee

Conduct study of legal and institutional feasibility and public acceptance of a potential water quality improvement fee.

From NGT pp. 9 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Strategic Planning

- Adopt Drinking Water Policy Framework for CALFED

A drinking water policy framework is needed that incorporates DWQP elements into all parts of CALFED program planning and implementation. The DWS has developed the policy framework, and it is currently being considered by BDPAC and other subcommittees.

From NGT pp. 46 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Conduct Final Assessment of DWQP Progress

The Drinking Water Subcommittee with CBDA support will conduct a final assessment and final recommendations on progress toward meeting CALFED water quality targets and alternative treatment technologies.

From ROD pp.67 *Milestone:*
Constituent All Region All
Bundled Link to Other Program(s)
Current Status:

- Conduct Initial Assessment of DWQP Progress

The Drinking Water Subcommittee, with support from the CBDA, will review the CALFED drinking water quality targets and conduct an initial assessment of progress toward meeting the CALFED water quality targets and alternative treatment technologies.

From ROD pp.67 *Milestone:* end of 2003
Constituent All Region All
Bundled Link to Other Program(s) ERP, WUE, Watershed
Current Status: Past due. A proposal for contract services for this work is under consideration.

- Conduct needs assessment of EJ communities and vulnerable populations

Perform a needs assessment of Drinking Water Infrastructure and Capacity that fully quantifies the resources needed for resolving the drinking water quality needs in the solution area, including capital infrastructure costs and the cost of capacity building for management.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Convene an Independent Science Panel to address drinking water quality problems and solutions

Convene an independent science panel(s) in a public forum to make recommendations to the California Bay-Delta Authority regarding solutions to identified water quality problems and public health issues for Delta water and local water sources.

From WQPP pp. 3-54, ROD pp. 67 *Milestone:* Recommendations
Constituent All Region All
Bundled Link to Other Program(s)
Current Status:

- Develop Interim water quality targets for the CALFED DWQP

Develop interim targets/milestones for water quality to help measure progress toward CALFED's water quality improvement and public health protection objectives.

From CALFED Phase II Report pp.45 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop Plan to Meet Upcoming Drinking Water Regulations

Develop a plan sufficient to meet forthcoming EPA and DHS drinking water standards for brominated and chlorinated DBPs.

From WQPP pp. 3-54 *Milestone:* Recommendations
Constituent TOC, Bromide Region San Joaquin, Delta
Bundled Link to Other Program(s)
Current Status:

- Establish performance measures for the DWQP

Develop a portfolio of performance measures and indicators for the DWQP. The DWQP has a list of candidate indicators, has established indicators for TOC and bromide in exported water, and plans to develop more indicators as resources and data allow.

From ROD pp.76 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Refine and expand Drinking Water Quality Improvement Strategy

Continue to refine the comprehensive drinking water quality improvement strategy to identify and control drinking water constituents of concern. A strategy for implementing measures will be further developed and refined based on the type of industry, state of technology, current regulations, cost, and other relevant considerations.

From WQPP pp. 3-14 *Milestone:* Priority Actions
Constituent All Region All
Bundled Link to Other Program(s)
Current Status:

- The Drinking Water Education Program

The Drinking Water Information Program will address the public's perception that tap water is not safe to drink through the development and dissemination of a full-length documentary, a summary video, a one-minute video clip,"Where your Drinking Water Comes From" (A Web based document which will identify whether drinking water sources are from ground water, local reservoirs, the Colorado River, the State Water Project, or the Central Valley project), and the development and airing of informational one minute radio spots.

From DWQ *Milestone:*
Constituent All Region State-Wide
Bundled Link to Other Program(s)
Current Status: Funded

Funded Water Education Foundation

Regional ELPH Plans

- Conduct RFP for Regional ELPH planning grants

The DWQP is planning to conduct an RFP process to provide matching grants for local/regional ELPH planning studies and activities.

From NGT pp. 5 *Milestone:* May-05
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop criteria for Regional/Local ELPH plans

The DWQP should develop definitions, guidelines and criteria to guide the development of Regional/Local ELPH plans that are consistent with and support CALFED goals.

From NGT pp. 29 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Regional ELPH Plans

- Evaluate regional ELPH strategies

Evaluate data collected on regional ELPH strategies to identify common water quality improvement projects, ensure regional plans are consistent with and support CALFED goals, and to ensure CALFED investments complement and leverage existing investments and strategies by local agencies.

From NGT pp.86 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Monitor regional ELPH strategies to ensure coordination

Monitor and collect data on regional ELPH strategies for coordination, identification of common elements, and identification of technical assistance needs.

From NGT pp. 86 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Provide technical assistance for regional ELPH planning activities

The DWQP should provide technical assistance to the regions for regional ELPH plans and water quality planning studies. Technical assistance could be provided through workshops at CALFED regional forums and BDPAC Subcommittees, and through the development and distribution of technical assistance materials.

From NGT pp.5 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Science and Improved Understanding

Analytical Methods

- Conduct inter-laboratory quality control study for bromide analyses

Conduct inter-laboratory comparative studies to demonstrate that DWR, SCVWD, MWD, Lawrence Berkeley Laboratory, and other laboratories performing bromide analyses of Delta water are able to produce comparable data.

From WQPP pp. 3-54 *Milestone:* Recommendations
Constituent Bromide Region All
Bundled Link to Other Program(s)
Current Status:

- Develop and Refine Water Quality Modeling Tools

Support the continuing efforts of state and federal agencies and stakeholder groups to develop, refine and utilize quantitative models to evaluate water quality effects of CALFED projects. Create and refine contaminant transport models for drinking water quality constituents, within the Delta, its tributaries and throughout the SWP system to provide the estimated relative contribution of various upstream sources.

From NGT pp.15, WQPP pp.3-20 *Milestone:* Information Needed
Constituent All Region All
Bundled Link to Other Program(s)
Current Status:

- Develop improved pathogen monitoring methods

Assistance in identifying and developing improved analytical techniques for Cryptosporidium and Giardia.

From WQPP pp. 3-20 *Milestone:* Information Needed
Constituent Pathogens Region All
Bundled Link to Other Program(s)
Current Status:

- Develop methodology for sustainable development

Establish a pilot project for developing a new methodology for sustainability assessment and apply to a test case addressing a water quality management issue.

From NGT pp. 39 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop Real-time MIB and geosmin monitoring capability

Develop technology to measure MIB and geosmin on a continuous real-time basis.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Development of new isotope tools for assessing sources of organic matter and nutrients in the SJR

This project will use an isotopic and chemical mass balance approach to determine the temporal and spatial variations in the relative contributions of different sources of nutrients and organic matter to the San Joaquin River-Delta-Bay system, with special focus on the critical reach upstream of Vernalis.

From DWQ *Milestone:*
Constituent Organic Carbon & Nutrients Region State-Wide
Bundled Link to Other Program(s)
Current Status: Funded

Funded USGS

- Resolution of Outstanding Issues in Delta Hydrodynamics and Water Quality Models

The project uses higher dimensional models in order to implement new empirical formulations in existing one-dimensional Delta models. The final stage includes evaluation of the accuracy of the model results on applications such as carriage water evaluations, impacts of Delta Cross Channel gates operations, and effects on seawater intrusion due to increase in tidal habitats in the Delta.

From DWQ *Milestone:*
Constituent Organic Carbon & DBPs Region Delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded EBMUD

Monitoring and Assessment

- Conduct a comprehensive monitoring and assessment program for the DWQP

Continue the development and implementation of a comprehensive monitoring and assessment program focused on drinking water quality through the support of ongoing monitoring programs, implementation of focused monitoring programs to address information needs and storing the data in a publicly accessible database. Monitoring and assessment activities should address surface water quality in the Bay-Delta watershed and the groundwater--surface water interactions.

From ROD, NGT pp. 24 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Connect utilities to DWR's Real-time Monitoring stations

Connect utilities to DWR's real-time monitoring stations so that operational and water quality data are displayed on treatment plant SCADA systems. This includes expanding the system to include remote monitoring at Lake Del Valle and other SWP lakes.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Evaluate and define baseline water quality conditions

Collect and evaluate existing drinking water quality monitoring data to establish baseline water quality conditions against which to measure the effectiveness of CALFED actions.

From NGT pp.24 *Milestone:*
Constituent All Region All
Bundled Link to Other Program(s) Science, ERP
Current Status: Some monitoring and assessment projects and programs in place but not comprehensive. Staff and funding needed to oversee and implement.

- Hydrologic Flow Measurement & Assessment of Organic Loads

Install continuous flow monitoring station at Hood, assess organic loads from Delta watersheds 1980-1999.

From DWQ *Milestone:*
Constituent Organic Carbon & DBPs Region Delta
Bundled Link to Other Program(s)
Current Status: Nearly complete, the only remaining task is installation of the organic carbon analyzer when the Vernalis station is complete.

Funded DWR

- Real Time, Continuous Monitoring of Bromide and Nutrients at H.O. Banks Pumping Plant and San Joaquin River at Vernalis

This project will install continuous monitoring instruments at Banks pumping plant and Vernalis to provide real-time data on bromide, chloride, phosphate and nitrate in surface waters.

From DWQ *Milestone:*
Constituent Organic Carbon & DBPs Region Delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded Santa Clara Valley Water District

- Vernalis Real-Time Water Quality Monitoring Studies

Construct a water quality monitoring station at Vernalis on the San Joaquin River. A telemetry system is also planned in order to allow real-time posting of all water quality data and flows.

From DWQ *Milestone:*
Constituent Salinity Region San Joaquin
Bundled Link to Other Program(s)
Current Status: Funded

Funded DWR

Public Health

- Develop a common definition of an equivalent level of public health protection (ELPH)

Develop possible definitions of an equivalent level of public health protection (ELPH) and test application on example drinking water sources.

From NGT pp. 19 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Develop a public health index

Develop model public health indices that would be used to assess level of public health protection and assess the effectiveness of alternative water quality improvement strategies. Pilot test model indices to assess current drinking water quality conditions. Possible expert panel for review and input.

From NGT pp. 31 *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Track health effects studies for drinking water constituents of concern

Track public health studies to more specifically identify the potential health effects of disinfection by-products and other drinking water contaminants of concern in surface water and groundwater.

From WQPP pp. 3-54 *Milestone:* Recommendations
Constituent Bromide, DBPs Region All
Bundled Link to Other Program(s)
Current Status:

Sources and Loads

- Conduct studies to evaluate sources and loads of drinking water constituents in the SWP system

Determine the concentrations, sources and loads of organic carbon, TDS, bromide, nutrients, pathogens, and other key drinking water constituents to the SWP system of aqueducts and reservoirs. Includes evaluation of the causes of increased bromide in San Luis Reservoir by quantifying the effects of evaporation and timing of reservoir filling. Also needed is improved understanding of the relationship between nutrient concentrations and loads in the Delta watershed, and the occurrence of excessive algae and macrophyte growth in water conveyance and storage facilities containing Delta water supplies.

From WQPP pp. 3-18, 3-21, 3-28, 3-53 *Milestone:* Recommendations
Constituent Bromide Region San Joaquin, Bay Area, and Southern California
Bundled Link to Other Program(s)
Current Status:

- **Conduct studies to evaluate sources and loads of drinking water constituents to the North Bay Aqueduct**

  Determine the concentrations, loads, and sources of organic carbon and other drinking water constituents at the Barker Slough Pumping Plant. Studies should address the in-channel contribution of algae and other aquatic plants, and the sources of organic carbon in the watershed. The study should include an analysis of the water quality impacts of CALFED ecosystem restoration activities on water quality at the Barker Slough Pumping Plant.

  From WQPP pp. 3-27 *Milestone:* Information Needed

  Constituent TOC, Pathogens Region North Bay Aqueduct

  Bundled Link to Other Program(s)

  Current Status: Done

- **Conduct studies to evaluate the sources and loads of drinking water constituents to the Delta watershed**

  Determine the concentrations, loads, and sources of organic carbon, TDS, bromide, nutrients, and pathogens, and other key drinking water constituents in the Bay-Delta watershed. Includes evaluation of loads from wastewater, urban runoff, agricultural discharges, managed wetlands, groundwater, and natural sources. Establish existing conditions and projected future conditions due to growth and changing land use patterns in the Central Valley. Include fingerprinting of sources of key constituents to the Delta.

  From WQPP pp.3-19, 3-20, 3-23 to 3-24, 3-25, 3-30, 3-34, 3-53, NGT pp.15 *Milestone:* Information Needed

  Constituent TOC,TDS, bromide, nutrients, pathogens Region San Joaquin, Sacramento, Delta

  Bundled Link to Other Program(s)

  Current Status:

- **Assessing Occurrence and Sources of Microbial Contamination in the Sacramento-San Joaquin Delta Region**

  Conduct microbial monitoring within the Delta to establish: 1) baseline data on the occurrence of human pathogens in the region; 2) sources of microbial contamination, whether agricultural, wildlife, or urban sprawl; and 3) levels of pathogen flux resulting from storm events

  From DWQ *Milestone:*

  Constituent Pathogens Region Delta

  Bundled Link to Other Program(s)

  Current Status: Awarded, funding lost

  Funded Metropolitan Water District of Southern California

- **Assessing the Occurrences and Sources of E.Coli and EC 0157 Contamination in Castaic Lake**

  Conduct a comprehensive microbial monitoring and molecular fingerprinting study, indentifying sources of nonpoint source pollution, implementing BMP to reduce coliform contamination in the Lake Castaic Watershed.

  From DWQ *Milestone:*
  Constituent Pathogens Region Southern California
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Metropolitan Water District of Southern California

- **Assessment of Organic Matter in the Habitat and its Relationship to the Food Chain**

  Evaluate habitat influences on the production and utilization of organic matter as food source in the Delta, and improve modeling capabilities. Obtain or measure food quality and quantity from various locations and habitat types.

  From ERP *Milestone:*
  Constituent Organic Carbon & DBPs Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded USGS

- **Determining the contribution of Riverine, In-Delta, and Aqueduct sources of Organic Carbon to Loads in the State Water Project using AMS Carbon Dating and Stable Isotope characteristics**

  Use environmental isotopes of C, N, and S to trace organic carbon sources in the Delta and determine the contribution of natural organic matter derived from peat island soils using Accelerator Mass Spectrometry. The project will evaluate the impact of future CALFED Delta alternatives on carbon sources and loads in the SWP.

  From DWQ *Milestone:*
  Constituent Organic Carbon & DBPs Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded DWR

- Dissolved Organic Carbon Release from Delta Wetlands Part 1

Part 1 of this study will focus on the concentration and quality of dissolved organic carbon / total organic carbon (DOC/TOC) released from different carbon sources to the Delta (wetland types, rivers and agricultural activities), assessing both disinfection byproducts (DBPs) and the incorporation into the Delta foodweb, and determines how microbial alteration affects the composition of DOC and DBPs.

From ERP *Milestone:*

Constituent Organic Carbon & DBPs Region Delta

Bundled Link to Other Program(s)

Current Status: Funded

Funded USGS

- Dissolved Organic Carbon Release from Delta Wetlands Part 2

The goals of this study are to quantitatively assess DOC/TOC and DBPPs loads exported from tidal wetlands, non-tidal wetlands, and agricultural activities into Delta channel waters. This information will quantify the relative contributions of DOC as both a food source and DBPP source from wetlands and agricultural activities in a way that will permit direct comparison.

From ERP *Milestone:*

Constituent Organic Carbon & DBPs Region Delta

Bundled Link to Other Program(s)

Current Status: Funded

Funded USGS

- Evaluating the Drinking Water Impact of Wetland Derived Organic Carbon

The hypothesis of this research is that different wetland management practices will result in different water quality outcomes and that these management practices will have a significant impact on the quantity and quality of the organic carbon that is released when the wetlands are drained.

From DWQ *Milestone:*

Constituent Organic Carbon Region San Joaquin Valley

Bundled Link to Other Program(s)

Current Status: Funded

Funded Lawrence Berkeley National Laboratory

- **Evaluation of groundwater nitrate and organic carbon inputs to the lower San Joaquin River and their sources**

  The objective of this project is to quantify the amount of groundwater accretions to the lower San Joaquin River and its nitrate concentration through the use of multiple lines of evidence. In addition, isotopic and optical characteristics of the groundwater will be compared to various endmembers to identify the sources of nitrate in the groundwater accretions.

  From DWQ *Milestone:*
  Constituent Nitrate, Organic Carbon Region San Joaquin Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded USGS

- **Hydrologic Flowpaths in Oak Woodland Landscapes: Implications for Dissolved Organic Carbon and Nutrient Transport**

  Project will investigate the temporal and spatial dynamics of hydrologic flowpaths across landscapes of four watersheds having different management strategies in the Sierra Nevada Foothills Research and Extension Center. Project will study the how these flowpaths influence the export of dissolved organic carbon and nutrient to surface water bodies.

  From DWQ *Milestone:*
  Constituent Organic Carbon & Nutrients Region Sacramento Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded UC Davis

- **Improving Delta Drinking Water Quality: Managing Sources of Disinfection Byproduct-Forming material in the State Water Project**

  Identify and quantify the dominant processes and sources that control the concentration of NOM and DBP forming materials in the State Water Project. The project will also identify mitigation efforts or management actions that may be implemented to reduce the concentration of DBP forming materials at water treatment plants.

  From DWQ *Milestone:*
  Constituent Organic Carbon & DBPs Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded USGS

- **Management of DOC, DBPP and nutrients loads from major agricultural land uses and development of BMPs**

  The goal of this proposed study is to identify and quantify the biogeochemical and hydrological processes contributing to the release of dissolved organic carbon (DOC) by agriculture and other land uses into Central Valley (CV) Rivers, as well as to explore possible strategies to mitigate DOC release.

  From DWQ *Milestone:*
  Constituent Organic Carbon & Nutrients Region Sacramento Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded USGS

- **Monitoring and Investigations of the San Joaquin River and Tributaries**

  This study is focused on an understaning of the sources of oxygen-consuming materials in the SJR upstream of the DWSC. The purpose of this study is to provide a comprehensive understanding of the sources and fate of oxygen consuming materials in the SJR and determine their linkages with the oxygen deficit in the DWSC.

  From ERP *Milestone:*
  Constituent Organic Carbon Region San Joaqun
  Bundled Stockton DO Problem Link to Other Program(s) ERP
  Current Status: Funded

  Funded San Joaquin River Valley Drainage Authority

- **Selenium and Nitrate Removal from Agricultural Drainage**

  Perform experiments using the Intermediate-Scale Algal-Bacterial Selenium Removal Facility to develop design criteria for full-scale (>10 acre-feet per day) treatment facilities.

  From DWQ *Milestone:*
  Constituent Nutrients, Salinity Region San Joaquin Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Panoche Drainage District

- **Steelhead Creek Drinking Water Quality Study and Watershed Assessment**

  Dry Creek conservancy and DWR will monitor flow and water quality, assess land use changes and identify solutions to improve water quality in the urbanized Steelhead Creek watershed.

  From DWQ *Milestone:*
  Constituent Organic Carbon, Turbidity, Pathogens Region Sacramento
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Dry Creek Conservancy

Source Improvement

Agricultural discharges

- Conduct initial study of Colusa Basin Drain Water Quality Alternatives

Conduct study to characterize the water quality effects of Colusa Basin Drain discharges to the Sacramento River, and evaluate options for improving downstream water quality, including possible re-routing of the Colusa Basin Drain to the Yolo Bypass.

From DWS 11-21-03 *Milestone:*

Constituent Salinity, organic carbon, nutrients, pesticides Region Sacramento, Delta

Bundled Link to Other Program(s)

Current Status:

- Conduct pilot studies and implement agricultural discharge management measures and control actions

Conduct pilot studies and implement agricultural discharge management measures and control actions to reduce discharge of drinking water constituents of concern. Actions would include treatment of drainage, relocation of discharge points, real-time management of agricultural discharges (such as release of drainage during ebb tidal flows), implementation of on-farm management practices, modification of land management practices, and land retirement programs for drainage-impaired lands. Emphasis should be placed on implementing cost-effective strategies. Conduct a comprehensive pilot study of potential methods to reduce organic carbon loadings to the central Delta from agricultural drains.

From WQPP pp. 3-13, 3-15, 3-16 *Milestone:* Priority Actions

Constituent Salinity, Organic Carbon, nutrients Region Sacramento, Delta, San Joaquin

Bundled Link to Other Program(s)

Current Status:

- Continue implementation of Old River Water Quality Improvement Project

Construct a new pump station and discharge outfall with a diffuser for agricultural drainage that is currently discharged from Byron Tract into Old River. Design and implement agricultural management practices to improve agricultural drainage water quality.

From WQPP pp. 3-32 ROD pp. 50 *Milestone:*

Constituent Salinity, organic carbon, nutrients Region Contra Costa Water District Intakes

Bundled Delta Improvement Package Link to Other Program(s)

Current Status:

- Continue implementation of Rock Slough Water Quality Improvement Project

Relocation of Veale Tract agricultural drainage from its current discharge point into Rock Slough to a new location on Werner Cut/Indian Slough. Design and implement agricultural management practices to improve agricultural drainage water quality.

From WQPP pp. 3-32 ROD pp. 50 *Milestone:*

Constituent Salinity, organic carbon, nutrients Region Contra Costa Water District Intakes

Bundled Delta Improvement Package Link to Other Program(s)

Current Status:

- Develop and implement a package of actions to reduce salinity in the San Joaquin River

This action includes implementation of pilot projects and full scale projects to reduce salinity discharges to the San Joaquin River from agricultural lands and managed wetlands, and manage salinity on a real-time basis in the San Joaquin River. Complete the salinity and boron TMDL and Basin Plan amendment for the lower San Joaquin River. Implement appropriate source control measures including on farm and district actions, conservation, drainage water reuse projects, agroforestry, evaluation of regional agricultural drainage desalination, management of wetlands discharges, and implementing a real-time management system for the river. Complete feasibility studies for recirculation of export water through the CVP and SWP to reduce salinity in the San Joaquin River, and develop recommendations for implementation.

From WQPP Chap 7, ROD pp.66-69 *Milestone:* end of 2003

Constituent salinity Region San Joaquin, Delta

Bundled Delta Improvements Package Link to Other Program(s) ERP, WUE, Watershed

Current Status: Several salinity reduction projects and treatment projects have been initiated by DWQP and ERP. Recirculation studies are underway.

- Implement management practices for grazing lands and confined animal facilities

Implement management practices to reduce discharge of drinking water constituents from grazing lands and confined animal facilities, such as dairies. CALFED should support development and field testing of management practices and enforcement by the RWQCBs of pollution prevention measures.

From WQPP pp. 3-24 *Milestone:* Priority Actions

Constituent Pathogens, nutrients, Region Sacramento, San Joaquin, Delta

Bundled Link to Other Program(s)

Current Status:

- **Adaptive Real-Time Water Quality management of Seasonal Wetlands in the Grassland Water District**

  Design a monitoring system for flow and water quality parameters, including real-time sensors. Develop a management plan, model to estimate salt load to the SJR, and perform adaptive management on releases in 2000, and 2001 spring flows.

  From ERP *Milestone:*
  Constituent Salinity Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Grassland Water District

- **Agricultural Discharge Management Program Monitoring and Evaluation - West Stanislaus County**

  This project will examine and evaluate four BMP strategies currently being used in the region for the control of sediments and pesticides: in-field practices, ponds, vegetated biofiltration systems, and constructed wetlands.

  From DWQ *Milestone:*
  Constituent Region San Joaquin Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded San Joaquin Valley Drainage Authority

- **Agricultural Drainage Treatment: Intermediate Scale Experiments**

  UCB has developed an Algal-Bacterial selenium removal process to remove selenium and nitrogen from subsurface agricultural drainage. This project will construct, operate, and monitor a 16-fold scale-up (1 AF/day). Site is adjacent to existing pilot facility.

  From DWQ *Milestone:*
  Constituent Selenium, Nutrients Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Panoche Drainage District

- **Bacterial treatment of Selenium in the Panoche Drainage**

  Demonstrate the effectiveness of microalgae as a substrate for nitrate and selenium reduction in agricultural discharge water. Treatment effectiveness and operational issues. Costs of process, to estimate costs for full scale operation.

  From ERP *Milestone:*
  Constituent Selenium Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Complete?

  Funded UC Davis

- Control of Agricultural Runoff

Develop a grower education program, identify and catalog agricultural tailwater discharges. Design, install and permit shutoff structures where discharges may enter District canals or drains. This project also includes purchase and operation of EC and flow telemetry systems.

From DWQ *Milestone:*
Constituent All Region San Joaquin
Bundled Link to Other Program(s)
Current Status: Funded

Funded Turlock Irrigation District

- Dairy Nutrient Management Program

Provide technical assistance to dairy producers to establish nutrient water application practices that reduce contaminant leaching to shallow groundwater and minimize tailwater discharges.

From DWQ *Milestone:*
Constituent Nutrients Region San Joaquin
Bundled Link to Other Program(s)
Current Status: Funded

Funded East Stanislaus Resource Conservation District

- Demonstration of on-farm vegetated buffers for reducing NPS pathogen pollution into tributaries of the Fresno and San Joaquin Rivers

This project will develop and implement on-farm vegetated buffers as a demonstration project for how to reduce microbial contamination of foothill tributaries draining into the Fresno and San Joaquin Rivers. In addition, we will conduct field days, workshops, and develop training manuals for how to install and monitor vegetated buffers and how to better monitor pathogen water quality from non-irrigated pasture runoff.

From DWQ *Milestone:*
Constituent Region San Joaquin Valley
Bundled Link to Other Program(s)
Current Status: Funded

Funded Coarsegold Resource Conservation District

- **Determining Mitigation Strategies to Prevent Contaminants from Animal Feeding Operations from Entering Drinking Water Sources**

  Assess the occurrence and processes that control the fate and transport of pathogens, pharmaceuticals and other organic waste products derived from animal feeding operations. Merced county will collect and analyze samples and evaluate practices to prevent contaminants from affecting drinking water supplies.

  From DWQ *Milestone:*

  Constituent Pathogens Region Sacramento, San Joaquin, Delta

  Bundled Link to Other Program(s)

  Current Status: Funded

  Funded Merced County Division of Environmental Health

- **Development and Implementation of Ricefield Management Practices to Improve Water Quality**

  Recent changes in cultural practices including straw, pest and irrigation management all have potential impacts on the quality of downstream waters for TOC, turbidity, pesticides and nutrients. This project will develop and implement management practices to mitigate the impact of ricefield tailwater to protect drinking water quality.

  From DWQ *Milestone:*

  Constituent Region Sacramento Valley

  Bundled Link to Other Program(s)

  Current Status: Funded

  Funded UC Davis

- **Grassland Drainage Area Reuse Development**

  The goal of this project is to improve the water quality of the San Joaquin River and Delta by diverting poor quality agricultural drain water away from the river and applying it for the irrigation of salt tolerant crops on the San Joaquin River Water Quality Improvement Project (SJRIP). This project will construct two pump stations and pipelines to deliver drain water to the SJRIP, install subsurface drainage systems (to maintain a salt balance) and plant 500 acres within the SJRIP with salt tolerant crops and halophytes.

  From DWQ *Milestone:*

  Constituent Region San Joaquin Valley

  Bundled Link to Other Program(s)

  Current Status: Funded

  Funded Panoche Drainage District

- **Harding Drain Watershed Agricultural and Urban Impacts-Evaluation Education and Outreach**

  This project will provide a detailed assessment of water quality, development of a watershed plan, education and outreach through a Watershed Coordinator, and on-site consultation on Best Management Practices for the Harding Drain Watershed. The detailed assessment will characterize flows, water quality, and pollutant loadings from agricultural and urban sources within the watershed and be used to develop a watershed plan.

  From DWQ *Milestone:*
  Constituent Region San Joaquin Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Turlock Irrigation District

- **Implementation of Buffer, Irrigation, and Grazing BMPs to Reduce Pathogens, TOC/DOC, and Turbidity from Rangeland and Irrigated Pasture**

  Current grazing and irrigation practices on the ~7,000,000 acres of rangeland and 500,000 acres of irrigated pasture in the Sacramento and San Joaquin River Watersheds is contributing to elevated microbial pathogen, organic carbon and colloidal pollutants levels in surface runoff. More information in required to provide guidance on the effective implementation of integrated buffer, grazing, and irrigation BMPs to reduce these pollutants in runoff from these landscapes. Project will develop this knowledge, translate it into specific BMPs, and extend these recommendations to water resources protection staff and land managers for implementation.

  From DWQ *Milestone:*
  Constituent Region Sacramento Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded UC Davis

- **Investigating In Situ Low Intensity Chemical Dosing to Decrease Delta Waters DOC**

  Assess use of low intensity chemical dosing of coagulants to remove DOS and DBPP from Delta island drainage water. This phase includes both laboratory and field studies.

  From DWQ *Milestone:*
  Constituent Organic Carbon, DBPs Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded USGS

- **Long Term Risk of Groundwater and Drinking Water Degradation from Dairies and Other Nonpoint Sources in the San Joaquin Valley**

  This project addresses nonpoint source contamination of groundwater in the San Joaquin Valley dairy regions. Specifically, nitrate, salinity, and microbial pathogens are of concern. The project meets critical source and ambient groundwater monitoring needs in Stanislaus/Merced County and Tulare/Kings County.

  From DWQ *Milestone:*
  Constituent Region San Joaquin Valley
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded UC Davis

- **Orestimba Creek Watershed - Agricultural Water Quality Pilot Program**

  Several cooperating entities will develop strategies to promote agricultural management practices and on-farm treatment technologies to reduce pesticide, nutrient, sediment and other contaminant loads to Orestimba Creek and the San Joaquin River.

  From DWQ *Milestone:*
  Constituent Nutrients, turbidity, Organic Carbon Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Coalition for Urban/Rural Environmental Stewardship

- **Recovery, Purification, and Utilization of Salts from Agricultural Drainage Water in the San Joaquin Valley**

  Primary objectives for this project include a comprehensive evaluation of water recovery and salt utilization in the Panoche Drainage District. The project will investigate recovery and purification processes, design, build, and test a salt recovery and purification pilot plant

  From DWQ *Milestone:*
  Constituent Salinity Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded DWR

- **Reducing Non-point DOC and Nitrogen Exports from Rice fields: A Pilot Study and Quantitative Survey to determine the effects of different hydrologic and straw management BMPs**

  CCWD and collaborators will develop wildlife friendly agricultural / hydrologic best management practices to minimize disinfection by-product precursor and nitrogen exports from rice fields to Delta drinking water supplies.

  From DWQ *Milestone:*
  Constituent Organic Carbon, Nutrients Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Contra Costa Water District

- **Rock Slough and Old River Drainage Management**

  CCWD will identify sources of water quality degradation from Byron Tract, Veale Tract, and into Old River

  From DWQ *Milestone:*
  Constituent Salinity Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Contra Costa Water District

- **Rock Slough and Old River Water Quality Improvements**

  Implement drainage relocation and diffuser projects on Veale and Byron tracts.

  From DWQ *Milestone:*
  Constituent All Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Contra Costa Water District

- **San Joaquin River Real-time Water Quality Management Program**

  This project will expand water quality monitoring activities in SJR to include installation and maintenance of monitoring stations, modeling and informational support.

  From ERP *Milestone:*
  Constituent Salinity Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded DWR

- **San Luis Drain Algae and TOC Control Project**

  Evaluate algal growth patterns, determine growth limiting conditions, sources of algae and nutrients in and upstream of the San Luis Drain to further control total organic carbon loading and oxygen depletion in the SJR.

  From DWQ *Milestone:*
  Constituent Organic Carbon Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Grassland Basin Drainers

- **Source identification, monitoring and outreach for reducing agricultural pathogens into the Sacramento-San Joaquin Delta Estuary**

  The goal of this project is to reduce animal agricultural inputs of bacterial indicators and pathogens in the many sloughs of the eastern section of the Sacramento-San Joaquin Delta. This project will identify animal agricultural operations that excessively load the sloughs of the eastern Delta with bacteria, develop and extend beneficial herd management practices that reduce protozoal contamination, develop regulatory guidance for more effective use of bacterial indicators, and enhance the ability of local communities, regulatory agencies, conservation groups, and agricultural managers to effectively monitor water quality and implement intervention strategies.

  From DWQ *Milestone:*
  Constituent Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded UC Davis

- **The Ecological and Economic costs and benefits of alternative agricultural practices: sediment, nutrient, and pesticides in runoff from conservation tillage and cover cropped systems**

  This research and demonstration project will study the effects of conservation tillage and cover cropping on export of sediment, nutrients, and pesticides in runoff from conventional and organic farms. The research will also evaluate and quantify the feasibility and ecological and economic costs and benefits of these practices.

  From ERP *Milestone:*
  Constituent Turbidity, Organic Carbon, Nutrients Region All
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded UC Davis

- Twitchell Island Subsidence Studies

Water quality element includes evaluating DOC and THMPs released from two agricultural field soils and a wetland to assess the effects of agricultural and wetland management on soil biological and chemical properties

From ERP *Milestone:*
Constituent Organic Carbon & DBPs Region Delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded USGS/DWR

- Veale-Byron Project / Rock Slough and Old River Water Quality Actions

Primary objectives for this project include the confirmation of sources of water quality degradation near CCWD intakes. The project will identify, document, and implement solutions to eliminate or minimize these impacts.

From DWQ *Milestone:*
Constituent Salinity Region Delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded Contra Costa Water District

Blending & WQ Exchanges

- Continue feasibility and planning studies for Water Quality Exchange Partnerships between San Joaquin Valley and Southern California

Investigate alternative sources of high-quality water supply for urban users of Delta water. Continue feasibility and planning studies for potential water quality exchange projects between agricultural interests in the San Joaquin Valley and the Metropolitan Water District of So. Calif. If agreement is reached by the parties involved, complete environmental review and begin implementation of a long-term program, including necessary infrastructure.

From WQPP pp. 3-54 ROD pp. 70 *Milestone:* December 2004
Constituent All Region San Joaquin, Southern California
Bundled Link to Other Program(s)
Current Status: Current work is focused on working with potential partners in Friant Water Users Authority. Funding source is DWR Prop 13 Grant to MWD for $20 million.

- Continue feasibility studies for the Bay Area Water Quality and Water Supply Reliability Project

Investigate regional projects to improve water quality and supply reliability in the San Francisco Bay Area. Complete feasibility study for potential projects. Complete environmental review, documentation and preliminary design on a selected project alternatives. Finalize agreements with project participants. Obtain necessary authorizations and funding. Begin construction.

From WQPP pp. 3-54 ROD pp. 69 *Milestone:* end of 2005
Constituent All Region Bay Area
Bundled Link to Other Program(s)
Current Status:

- Bay Area Blending and Exchange Project

The BABE project is examining the feasibility of blending or exchanging the source waters among Bay Area water utilities to achieve improvements in water quality. By working cooperatively, Bay Area water providers could more reliably provide an overall higher quality of water for all users.

From DWQ *Milestone:*
Constituent Salinity, Organic Carbon Region Bay
Bundled Link to Other Program(s)
Current Status: Funded

Funded Association of Bay Area Governments

Conveyance/Delta Operations

- Complete planning studies for the Intertie between SWP and CVP

A 400 cfs intertie between the CVP and SWP aqueducts downstream of the Delta pumps is proposed. The intertie would provide operational flexibility and improve water supply reliability for the CVP. Planning studies and joint state and federal environmental documentation are in progress.

From ROD pp.52, ELPH paper *Milestone:* 2004
Constituent Region San Joaquin
Bundled Delta Improvement Package Link to Other Program(s)
Current Status: A public draft EIR/EIS is expected to be released in 2004.

- Complete planning studies for the San Luis Reservoir low point project

Evaluate alternatives to solve San Luis Reservoir low point problem to improve water quality for CVP San Felipe Division and increase effective storage capacity in San Luis Reservoir. Complete environmental review and seek federal project authorization and funding for additional planning studies and project permitting.

From ROD pp.53, ELPH paper *Milestone:* end of 2004
Constituent All Region CVP San Felipe Division
Bundled Link to Other Program(s)
Current Status: The draft project EIR/EIS is scheduled for release in 2004.

- Conduct Franks Tract Restoration Planning and Feasibility Studies

Franks Tract Restoration is an ERP project in the ROD. Planning and feasibility studies are needed to address alternatives for Franks Tract restoration (i.e., changes to existing levee structure) and evaluate the potential to improve ecosystem habitat, levee stability and Delta water quality by reducing sea water intrusion.

From ROD pp.36, ELPH paper *Milestone:* 2002
Constituent Salinity, bromide Region Delta
Bundled Delta Improvements Package Link to Other Program(s) Ecosystem Restoration Program
Current Status: Preliminary modeling and studies have been done. More studies needed. This started as an ERP project but now is of more interest for its water quality benefits

- Consider strategies for implementing the North Bay Aqueduct (NBA) Intake Relocation project

Feasibility studies on relocating North Bay Aqueduct intake are complete. Construction of an alternate intake would provide water quality benefits and operational flexibility to avoid diversions during times of year to protect Delta smelt. It would also allow better source water quality during winter when local watershed runoff is of poor quality. Funding is needed for project implementation.

From ROD pp.68, ELPH paper *Milestone:* 2003
Constituent Organic Carbon, Pathogens Region North Bay Aqueduct
Bundled Link to Other Program(s)
Current Status: Feasibility study is complete; project cost ~$150 M

- Participate in the North Delta Improvement Program technical studies to evaluate potential water quality benefits

Participate in technical studies to evaluate the potential water quality benefits of improved Delta Cross Channel (DCC) operations and evaluate the feasibility and water quality benefits of a new Through-Delta Facility (TDF) on the Sacramento River in the North Delta. Complete technical water quality and fisheries studies and develop project recommendations.

From ROD pp.50-51, ELPH paper *Milestone:* end of 2003
Constituent Salinity, bromide Region Delta
Bundled Link to Other Program(s)
Current Status: CALFED DCC/TDF Project Team currently conducting studies.

- North Bay Aqueduct Alternative Intake Study

Conduct an engineering, cost and environmental analysis of an alternate intake for NBA

From DWQ *Milestone:*
Constituent Organic Carbon, Pathogens, Region Delta
Bundled Link to Other Program(s)
Current Status: Funded
Funded Solano County Water Agency

State & Regional Board Policies

- Complete San Joaquin River Salinity TMDL and Basin Plan Amendment

Finalize State Basin Plan Amendment and TMDL for salinity in the lower San Joaquin River. Part of the ROD commitment to address agricultural drainage problems in the San Joaquin Valley.

From ROD pp. 67 *Milestone:* end of 2001
Constituent salinity Region San Joaquin, Delta
Bundled Delta Improvements Package Link to Other Program(s)
Current Status: TMDL has been proposed, CVRWQCB will hold workshops in spring 2004

- **Conduct technical studies to support development of a Central Valley Drinking Water Policy**

  Continue the activities of the agency and stakeholder work group established to work on this project. The workgroup is conducting technical studies to support development of a Central Valley Drinking Water Policy by the Central Valley RWQCB to explicitly and directly protect/improve drinking water quality in the Delta and its tributaries.

  From ROD pp. 67 NGT pp. 15 *Milestone:* end of 2004

  Constituent All Region San Joaquin, Sacramento, and Delta

  Bundled Link to Other Program(s) ERP, WUE, Watershed

  Current Status: Work is in progress, new estimated completion date is 2009. Current work is funded by stakeholders. Other potential funding sources include SWRCB & DWQP RFP, EPA and SRWP.

- **Watershed Monitoring and Technical Studies to Support Development of Central Valley Drinking Water Policy**

  This project involves conducting the technical studies needed to develop a drinking water policy for the Central Valley, as called for by the CALFED Record of Decision (pg. 67). A major focus of the project is gathering, assembling and analyzing monitoring data for drinking water consituents of conern, which may arise from a variety of sources, and evaluating potential control alternatives.

  From DWQ *Milestone:*

  Constituent Region State-Wide

  Bundled Link to Other Program(s)

  Current Status: Funded

  Funded California Urban Water Agencies

Storage

- **Continue studies on the expansion of Los Vaqueros Reservoir for potential water quality benefits**

  An expanded Los Vaqueros will improve drinking water in the Bay Area by providing a high quality source of blending water.

  From ROD, ELPH paper *Milestone:*

  Constituent Region

  Bundled Link to Other Program(s)

  Current Status:

- Evaluate North of Delta storage for water quality improvement

Evaluate North of Delta storage/proposed Sites Reservoir managed for WQ improvement in the Delta and at drinking water intakes. Determine potential water quality benefits and costs of storage operation alternatives including making storage releases to repel seawater intrusion and improve Delta water quality.

From ROD pp. 45 ELPH paper *Milestone:* 2004

Constituent Salinity, bromide Region Sacramento, Delta

Bundled Link to Other Program(s)

Current Status:

- Evaluate upper San Joaquin River storage for water quality improvement

Evaluate upper San Joaquin River storage managed for water quality improvement in the San Joaquin River and Delta. Determine potential water quality benefits and costs of storage operation alternatives for improving San Joaquin River and Delta water quality.

From ROD pp. 45 ELPH paper *Milestone:* 2006

Constituent Salinity, dissolved oxygen Region San Joaquin, Delta

Bundled Link to Other Program(s)

Current Status:

Water conveyance/storage facilities

- Complete planning studies and implement structural improvements to protect aqueduct and reservoir water quality

Complete studies to evaluate necessary physical modifications to protect water quality in the SWP California Aqueduct and other similar conveyances (e.g., modifications to berms, bypasses, and storm drains to divert stormwater away from and prevent its discharge into the California Aqueduct). Evaluate structural alternatives at Castaic Lake and Elderberry Forebay to control algae and Taste & Odor events in Castaic Lake. Identify and begin implementation of necessary physical improvements.

From ROD pp.68, WQPP *Milestone:* 2005

Constituent turbidity, Organic Carbon, pathogens, nutrients Region San Joaquin, Bay Area, and Southern California

Bundled Link to Other Program(s) Watershed, DWR Operations

Current Status: Projects underway. Further work needed to identify and prioritize specific projects. Funding needed to complete planning studies and make necessary improvements.

- Implement the Contra Costa Canal Lining (Encasement) Project

The proposed project includes lining or encasing 1,900 feet of the Contra Costa Canal near the Rock Slough intake to prevent poor quality agricultural drainage seepage into the drinking water supply.

From CCWD *Milestone:*
Constituent All Region CCWD
Bundled Delta Improvement Package Link to Other Program(s)
Current Status:

- Contra Costa Canal Encasement Project

Encase first 1900 feet of Contra Costa Canal to stop infiltration of high TDS groundwater.

From DWQ *Milestone:*
Constituent Salinity Region Delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded Contra Costa Water District

- Lake Perris Dissolved Oxygen Enhancement Project

Review existing evaluation of solutions for improving oxygen levels at Lake Perris and identify preferred approach. Prepare design and construct the selected alternative. Alternatives to be considered include introducing oxygen and mixing of the lower lake levels.

From DWQ *Milestone:*
Constituent Taste, odor, other pollutants Region So Cal
Bundled Link to Other Program(s)
Current Status: Funded

Funded Metropolitan Water District of Southern California

Watersheds

- Evaluate and implement strategies to reduce water quality impacts from body-contact recreation and recreational boating.

Evaluate and implement strategies to reduce water quality impacts from body-contact recreation and recreational boating. Conduct an evaluation of the impacts of body-contact recreation and evaluate methods to minimize pathogen loading from such activities without causing unacceptable restrictions to recreational use, such as creating and maintaining bermed off swimming areas. Develop and implement public education programs, and support enforcement programs to reduce discharges of human wastes from boats. Provide secondary containment for all sanitary facilities at drinking water supply reservoirs to minimize contamination from wastewater spills.

From WQPP pp.3-13, 3-16, 3-28, 3-37&38 *Milestone:* Priority Actions

Constituent Pathogens Region All

Bundled Link to Other Program(s)

Current Status:

- Evaluate methods to reduce loading of Drinking Water Constituents and implement cost-effective source improvement measures

Conduct an analysis of methods to reduce the loading of drinking water constituents to the Delta watershed. Determine the cost-effectiveness of potential control strategies and estimate the resultant water quality benefits. The study should address methods to reduce pollutant loading from point and non-point sources in rural and urban areas. Consistent with the Central Valley Drinking Water Policy, the CVRWQCB, with support from DWR and DHS, will begin implementation of appropriate source control measures (e.g., advanced wastewater treatment, local drainage management practices).

From WQPP pp.3-19, ROD pp.67 *Milestone:* end of 2006

Constituent All Region Delta, Sacramento, San Joaquin

Bundled Link to Other Program(s) ERP, WUE, Watershed

Current Status: Not due yet

- **Implement watershed programs to protect water quality in SWP and other water supply facilities**

  Develop and implement watershed programs in areas adjacent to the California Aqueduct and other conveyance channels to reduce stormwater runoff and improve the quality of stormwater flows. Conduct planning studies and implement projects to improve water quality in Clifton Court Forebay (CCFB), such as increased dredging frequency in CCFB, algae control and watershed programs to reduce nutrients and pathogens. Develop and implement management programs for the SBA watershed and upper Lake Del Valle watershed to protect water quality. Install remote water quality monitoring equipment at Lake Del Valle to facilitate operations and blending strategies to manage water quality.

  From WQPP pp.3-27 to 3-38, ROD pp.68 *Milestone:* beginning of 2004

  Constituent All Region San Joaquin, Bay Area, and Southern California

  Bundled Link to Other Program(s) Watershed, DWR Operations

  Current Status: Projects under way in most California Aqueduct watersheds and several others. Effectiveness uncertain.

- **Support local watershed management programs that improve drinking water quality**

  Support local community-based watershed programs whose activities are consistent with and support the goals and objectives of the CALFED DWQP. Support the implementation of watershed projects that would reduce water quality impacts from agricultural and urban discharges/runoff into local source water watersheds and reservoirs, and control algae. Support the Sacramento River Watershed Program and encourage the formation of a San Joaquin River watershed program to address water quality concerns in the watershed.

  From WQPP *Milestone:* Priority Actions

  Constituent All Region All

  Bundled Link to Other Program(s) Watershed

  Current Status:

- **Adaptive Real-Time Water Quality Monitoring and management of Seasonal Wetlands and the San Luis National Wildlife Refuge to Quantify Contaminant Sources and Improve Water Quality in the San Joaquin River**

  Will construct and maintain monitoring station systems at San Luis National Wildlife Refuge to evaluate managed wetland drainage and water quality. Data obtained from this study will be used to develop a multi-objective habitat evaluation and salinity management program to optimize wetland functions and minimize water quality impacts on the San Joaquin River.

  From DWQ *Milestone:*
  Constituent Salinity, Organic Carbon, Selenium Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded Lawrence Berkeley National Laboratory

- **CCC Knightsen Water Quality Drainage Improvement**

  Primary objectives for this project include establishing a Community Service District in the Knightsen area of Contra Costa County to control storm water and flooding, and study the potential for remediation of storm water contaminants using wetlands systems near the Veale Tract area.

  From DWQ *Milestone:*
  Constituent All Region Delta
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded

- **County of Tuolumne Water Quality Plan**

  Perform water quality baseline assessments, develop a non-point source water quality plan and implement best management practices to improve water quality in the Stanislaus and Tuolumne river watersheds.

  From DWQ *Milestone:*
  Constituent All Region San Joaquin
  Bundled Link to Other Program(s)
  Current Status: Funded

  Funded County of Tuolumne Planning Division

- Current Condition Assessment of the Silver Creek Drainage and Panoche Alluvial Fan Areas of the Panoche/Silver Creek Watershed

This project will engage local stakeholders to develop a resource assessment for the Silver Creek Drainage and the Panoche Alluvial Fan, and develop a list of potential management actions and projects to improve water quality.

From WSP *Milestone:*
Constituent Turbidity, Organic Carbon, Pathogens, Nutrient Region San Joaquin
Bundled Link to Other Program(s)
Current Status: Funded

Funded Westside RCD

- Development of a Watershed Management Program for the South Bay Aqueduct System

This project will develop a Watershed Management Program for the South Bay Aqueduct (SBA) system.

From DWQ *Milestone:*
Constituent All Region Bay Area
Bundled Link to Other Program(s)
Current Status: Funded

Funded Alameda County Water District

- Dominguez Gap Wetlands Multiuse Project

The Dominguez Gap Spreading Grounds is owned and operated by the County of Los Angeles Department of Public Works and consists of two basins, one on each side of the Los Angeles River. The project proposes to develop extensive wetland and riparian habitat in the east basin to enhance water quality before infiltration in the west basin.

From DWQ *Milestone:*
Constituent Region So Cal
Bundled Link to Other Program(s)
Current Status: Funded

Funded Los Angeles County Flood Control District

- Dry Creek Watershed Stewardship Group

This project will coordinate a number of activities to support watershed management, including public outreach and education, assessment, monitoring, restoration and ongoing maintenance.

From WSP *Milestone:*
Constituent All Region Sacramento
Bundled Link to Other Program(s)
Current Status: Funded

Funded Dry Creek CRMP

- East San Joaquin Water Quality Framework

There is a compelling need to organize and coordinate, on a regional basis, the efforts of parties with an interest in improving water quality.

From DWQ *Milestone:*
Constituent All Region San Joaquin Valley
Bundled Link to Other Program(s)
Current Status: Funded

Funded San Joaquin River Group

- Evaluating BMP Effectiveness to Reduce Volumes and Improve Quality of Runoff from Urban Environments

This project will quantify the effectiveness of best management practices implemented in residential landscapes to reduce dry season runoff volume and the pesticides, drinking water pollutants, and mercury loads in the runoff. This study takes place in Sacramento and Orange Counties and will include an economic assessment of the cost effectiveness of BMPs utilized to reduce pollution.

From DWQ *Milestone:*
Constituent Region Sacramento Valley
Bundled Link to Other Program(s)
Current Status: Funded

Funded UC Davis

- Lake Perris Pollution Prevention and Source Water Protection Program

Perform water quality and pathogen risk assessments associated with recreational and water contact use activities that effect drinking water in Lake Perris, in order to develop strategies for reduction of risk through treatment processes or other physical solutions.

From DWQ *Milestone:*
Constituent Pathogens Region Southern California
Bundled Link to Other Program(s)
Current Status: Funded

Funded Metropolitan Water District of Southern California

- Little Panoche and Cantua Creek Watershed

Conduct assessments of Little Panoche and Cantua Creek watersheds to identify and quantify significant sources of sediment and selenium, as well as erosion and tranport mechanisms that affect land use in the Valley floor and water quality in the California Aqueduct.

From DWQ *Milestone:*
Constituent turbidity, Organic Carbon, pathogens, nutrients Region San Joaquin
Bundled Link to Other Program(s) Conveyance Watershed Programs
Current Status: Funded

Funded Westside RCD

- North Bay Aqueduct Watershed Best Management Practices

SCWA will local range and agricultural land owners to perform water quality assessments, install fencing, improve riparian areas and grazing management palns to improve water quality in the North Bay Aqueduct system.

From DWQ *Milestone:*

Constituent Organic Carbon, Pathogens Region Delta

Bundled Link to Other Program(s)

Current Status: Funded

Funded Solano County Water Agency

- Panoche Creek Stabilization Project

This project will provide for a permanent low-flow crossing at North Avenue and Panoche Creek. The project would reduce sediment and contaminant loads and improve downstream water quality.

From WSP *Milestone:*

Constituent Turbidity, Organic Carbon, Pathogens, Nutrient Region San Joaquin

Bundled Link to Other Program(s)

Current Status: Funded

Funded Westside RCD

- Salt and Martinez Creeks Watershed Assessments

WRCD will perform watershed assessments evaluating natural and anthropogenic land use that affect water quality degradation in the California Aqueduct and production on agricultural lands on the alluvial fan of the Salt and Martinez Creek Watersheds.

From DWQ *Milestone:*

Constituent turbidity, Organic Carbon, pathogens, nutrients Region San Joaquin

Bundled Link to Other Program(s) Conveyance, Watershed

Current Status: Funded

Funded Westside RCD

- The Arroyo Pasajero Watershed: Restoring the Land for the Water

This project will support development of Ranch and Farm Plans, development and implementation of BMPs to reduce sediment in runoff (as well as salt & asbestos) in the Arroyo Pasajero Watershed (affects CA aqueduct).

From WSP *Milestone:*

Constituent Turbidity, Organic Carbon, Pathogens, Nutrient Region San Joaquin

Bundled Link to Other Program(s)

Current Status: Funded

Funded Westside RCD

- The Stewards of the Arroyo Pasajero CRMP: Sharing Our Success

This project will provide support for land management activities in the Domengine watershed, as a part of the Arroyo Pasajero watershed. Activities include noxious weed removal, sediment and nutrient control and grazing & irrigation water management.

From WSP *Milestone:*

Constituent Turbidity, Organic Carbon, Pathogens, Nutrient Region San Joaquin

Bundled Link to Other Program(s)

Current Status: Funded

Funded Westside RCD

- The Water You Play In Is the Water You Drink

Develop and implement a comprehensive, long-term public outreach and education program, and establish a marina best management practices pilot program, focuesed on reducing contaminant loading associated with marinas, water contact sports, and recreational boating that affect drinking water quality in Delta waterways.

From DWQ *Milestone:*

Constituent Pathogens, gasoline, oil Region Delta

Bundled Link to Other Program(s)

Current Status: Funded

Funded Contra Costa County Clean Water Program

- Watershed Projects assessment/capacity development

The CBDA Watershed Program has funded 47 projects in the DWQP solution area that help local watershed groups to assess their watersheds and implement watershed programs. Most of these help to improve/protect drinking water quality.

From WSP *Milestone:*

Constituent All Region All

Bundled Link to Other Program(s)

Current Status: Funded

Funded various

Treatment Technology

Adaptive Management

- Assess Technology Timing

Compare the timing of research and demonstration projects to implementation with the schedule for obtaining WQ goals.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Establish and Use an Expert Panel

Advise as to technology gaps based on state of technology knowledge.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Track Emerging Contaminants

Track external research for applicability.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Track External Research

Track relevant external research efforts and assess relevance to a Delta solution.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Track Upcoming Regulations

When a regulation is set or new constituent is discovered: (a) add to monitoring, (b) determine if it effects treatment technology.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Bromide

- Demonstrate Bromide Removal Technology

Demonstrate the feasibility of bromide reduction technology in the treatment of Delta water to reduce disinfection by-product formation.

From DWQ *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

- Bromate Control with Carbon Dioxide Addition

Evaluate the design and economic feasibility of carbon dioxide as a pH depression strategy for reducing bromate formation during ozonation of SWP water, and the use of air stripping to remove excess carbon dioxide from the ozone contactor.

From DWQ *Milestone:*
Constituent Bromide Region Multiple
Bundled Link to Other Program(s)
Current Status: Funded, essentially completely, successfully controlled bromate formation.

Funded

Groundwater Contaminants

- Demonstrate Groundwater Treatment Technology

Demonstrate the feasibility of removing/reducing contaminants specific to groundwater (arsenic, perchlorate) through treatment technology.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Nutrients

- Demonstrate Algae Treatment Technology

Algae causes taste and odor problems, poses potential health risks, and clogs filters. This is a proposal to investigate the removal of algae within the treatment train, although no specific actions are suggested.

From New *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status:

Organic Carbon

- Demonstrate Organic Carbon Removal Technology

Demonstrate the feasibility of organic carbon reduction technology in the treatment of Delta water to reduce disinfection by-product formation.

From *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status: Funded

- Advanced Pretreatment for Organic Carbon Removal from Delta Water

SCWA is evaluating ion exchange resins as an advanced pretreatment process to remove organic carbon from North Bay Aqueduct water, which may substantially reduce disinfection by-product formation.

From DWQ *Milestone:*
Constituent Organic Carbon Region delta
Bundled Link to Other Program(s)
Current Status: Funded

Funded

Pathogen Disinfection

- Demonstrate UV Disinfection Technology

Initiate a UV disinfection plant demonstration project.

From ROD,WQPP pp. 3-17 *Milestone:* end of 2002
Constituent All Region All
Bundled Link to Other Program(s)
Current Status: CBDA staff consider this ROD commitment complete. The Program has supported two projects studying UV disinfection.

- Bay Area Advanced Treatment Research

Pilot and demonstration scale applied research on combinations of new disinfectants including UV, with advanced filtration for bay area waters.

From DWQ *Milestone:*
Constituent Region
Bundled Link to Other Program(s)
Current Status: EPA, AWWARF funded Phase I

Funded

- Integrating Ultraviolet Light to Achieve Multiple Treatment Objectives

MWD is evaluating the ability of ultraviolet light treatment, when integrated with water treatment oxidants such as chlorine, ozone, and chlorine dioxide, to protect public health.

From DWQ *Milestone:*
Constituent Pathogens, organic compounds Region Multiple
Bundled Link to Other Program(s)
Current Status: Funded

Funded

Salinity

- Demonstrate Desalination as Treatment Technology

Demonstration Projects for desalination as drinking water treatment in relevant regions.

From New *Milestone:*
Constituent Salinity Region All
Bundled Link to Other Program(s)
Current Status:

- Irvine Desalter Project

The Irvine Desalter Project will pump the mineral rich water to a reverse osmosis water treatment plant for demineralization to make it suitable for domestic use.

From DWQ *Milestone:*
Constituent Salinity Region So Cal
Bundled Link to Other Program(s)
Current Status: Funded

Funded Irvine Ranch Water District