

CALFED Drinking Water Quality Program
Multi-Year Plan (Years 4-7)
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CALFED Drinking Water Quality Program Multi-Year Plan (Years 4-7)

1. Goals and Objectives

Safe drinking water is important to all Californians - and to the state and federal agencies that comprise the CALFED Bay-Delta Program. One of the objectives of the CALFED agencies is to ensure continuous improvements in the water quality of the Bay-Delta for all beneficial uses.

The DWQP goal is to provide safe, reliable, and affordable drinking water to the 22 million Californians who rely on the Delta for all or part of their drinking water. To reach this goal, DWQP actions combine cost-effective improvements in source water quality, advancements in treatment technology, and innovations in water management. Overall, DWQP will strive to effectively integrate drinking water source protection, treatment, and distribution in order to improve public health protection. Furthermore, DWQP will support health effects research of Delta drinking water, and will perform comprehensive monitoring and assessment of Delta drinking water quality.

CALFED DWQP studies and actions fall into four broad categories that are intended to:

- Enable users to capture more drinking water during periods of high Delta water quality,
- Reduce contaminants that impair Delta water quality,
- Evaluate alternative approaches to drinking water treatment and distribution, to address growing concerns about pathogens, disinfection by-products, and salinity, and
- Promote voluntary exchanges or purchases of high-quality source waters for drinking water.

All of these studies and actions must be pursued in conjunction with other CALFED actions to generate significant improvements in drinking water at the tap. The information generated by the drinking water quality studies and actions will serve as the basis of review by panels of independent experts in 2003 and 2007. These panels will be convened to review the results of drinking water studies, to assess the continued appropriateness of the water quality targets, and to make recommendations on future actions to improve drinking water quality. Water quality studies and actions must be conducted with monitoring and assessment, and will be coordinated with the appropriate agencies or existing programs.

The CALFED program specific target for providing safe, reliable, and affordable drinking water in a cost-effective way, is to achieve either: (a) average concentrations at Clifton Court Forebay and other southern and central Delta drinking water intakes of 50 µg/L bromide and 3.0 mg/L total organic carbon, or (b) an equivalent level of public health protection using a cost effective combination of alternative source waters, source control and treatment technologies.

Work has progressed on all of the Record of Decision commitments since its adoption of the August of 2000 with emphasis on source water improvement and treatment technologies. The Drinking Water Subcommittee (DWS) of the Bay-Delta Public Advisory Committee, successor to the Delta Drinking Water Council, provides stakeholder input. The DWS has developed a framework for drinking water quality management stemming from discussion of the ROD water quality targets. This framework is captured in the “Equivalent Level of Public Health

Protection” (ELPH) diagram named for the language in the ROD. Management actions available at the CALFED programmatic scale and at the regional level are shown on the ELPH diagram and described in more detail in a companion document. The next step for the DWS is to develop recommendations for strategic actions and spending.

2. Look Back (Years 1-3)

Early implementation projects US EPA and the CALFED ERP funded ___ projects in the early implementation phase of the CALFED program that addressed drinking water issues.

2001 proposal solicitation and awards: The DWQP awarded grants for 13 projects totaling \$7.3 million. The majority of these projects were for treatment technology development or science.

2002 State Water Resources Control Board RFP: The SWRCB with the DWQP taking the lead on the selection process awarded grants for 13 projects totaling \$7.2 million in Prop 13 nonpoint source funds. Seven of these projects related to agriculture in the San Joaquin Valley.

2003 State Water Resources Control Board RFP: The SWRCB released a consolidated RFP which includes \$31.5 in Year 3 funds for the DWQP. The selection process will begin in Year 3 with final project selection in Year 4.

The following is a description of progress on ROD commitments and complimentary actions.

San Joaquin Valley Agricultural Drainage

DWR Agricultural Drainage Program (salinity and selenium): Includes management and coordination, monitoring and evaluation, on-farm drainage reduction, treatment, integrated drainage management and environmental investigations. In Year 3 the DWQP funded a position in the Office of Water Use Efficiency was cut due to State General Fund reductions.

Central Valley Regional Water Quality Control Board (CVRWQCB) Basin Plan Amendment (BPA) (salinity and boron): The draft BPA was circulated for public review. Funding has been eliminated and no further work is planned.

Source Control

Monitoring and Assessment: CALFED Monitoring and Assessment Program (MAP): Identified existing monitoring programs, funded 15 projects for \$8 million. Information is available on CALFED website.

Sacramento River Watershed Program: [US EPA]

Drinking Water Policy for the Delta and its Tributaries: Multi-agency and stakeholder workgroup developed comprehensive workplan to prepare a policy proposal

to the CVRWQCB. The targeted outcome is to e a BPA. Funding (CALFED, CUWA and Sacramento Regional Waste Water Treatment Plant) has been identified for the effort.

Drinking Water Subcommittee (DWS)

The subcommittee was formed and has been meeting monthly. The DWS has developed an outline and conceptual flowchart for achieving an “equivalent level of public health protection” (ELPH), which will lead to a strategic plan for implementing ELPH. The DWS presented recommendations to BDPAC on agricultural waivers, advanced treatment technologies, and Proposition 50 implementation. The DWS also drafted a policy framework for assessing CALFED project impacts on drinking water quality.

Treatment Technology

Ultraviolet (UV) Light Disinfection: A CALFED grant for \$161,000 was awarded to Metropolitan Water District (MWD) to study integration of UV disinfection with treatment oxidants. Equipment has been installed, and the project is running smoothly.

Regional Desalination:

- 1) Agricultural drainage water recycling using membrane technology by Panoche Drainage District (CALFED grant). The project will begin in Year 4.
- 2) Desalination Research and Innovation Partnership (DRIP): A MWD project intended to demonstrate innovative desalination technologies to treat a variety of brackish and high salinity wastewaters. The program has already resulted in the development of advanced reverse osmosis (RO) membranes.

CALFED grants for **other treatment technologies** have been awarded, such as ion exchange and bromate control.

Control Run-off into Conveyances

DWR completed the sanitary survey of the State Water Projects and its tributaries. DWR also conducted water quality sampling of run-off into the California aqueduct and the South Bay Aqueduct.

North Bay Aqueduct:

A Proposition 204 grant to evaluate watershed management on Barker Slough has been completed. The project involved monitoring water quality and developing and implementing pilot Best Management Practices (BMPs). Two CALFED grants were awarded. One funds the main recommended BMP – livestock fencing within the watershed. The other funds a study evaluating an alternate intake for the North Bay Aqueduct.

Operational Improvements/ Recirculation in the San Joaquin River:

US Bureau of Reclamation and DWR have completed the modeling studies, which are undergoing management review. The reports will then be forwarded to the fisheries agencies for a preliminary fish and wildlife evaluation. In May 2003, a milestone review decision will be made whether to continue to the second year of the study.

Bay Area Water Quality and Supply Reliability Program

This program is evaluating cooperative projects among Bay Area water districts to meet their water supply reliability and drinking water quality objectives. Phase 1 (Years 1-3) was funded through \$100,000 in early implementation funds. Phase 1 evaluated overall Bay Area water quality, developed a list of potential projects and provided a qualitative evaluation of the ability of existing infrastructure to provide sufficient high quality water to meet the drinking water objectives in the ROD.

San Joaquin Valley / Southern California Water Quality Exchanges

MWD has entered into two partnerships with San Joaquin Valley water agencies to explore water management opportunities to help resolve water supply and water quality management problems.

Plan to Meet Delta Water Quality Standards

This is being met through a collection of several programs / projects by a variety of agencies. The **CVRWQCB agricultural drainage TMDL** was drafted and circulated for public review, but funding for further work has been cut. **DWR's South Delta Improvements Program** is an eight-year program. In 2002, the SDIP project was truncated to installation of barriers called out in the ROD and the increase in diversion capability into Clifton Court Forebay (CCF) to 8500 cfs. A new Clifton Court intake with fish screens and increasing the CCF diversion capability to 10,300 cfs was delayed until more results are known from studies such as the Tracy fish test facility. The SDIP held public scoping meetings in October 2002 and has met with stakeholders regarding the proposed operations of 8500 cfs. Stakeholders have also given input on the operations of the proposed permanent operable barriers.

Real Time Monitoring and Management of Salinity: The Regional Board, DWR, and Lawrence Berkeley National Laboratory in cooperation with the USGS and local water districts, implemented a real-time monitoring and modeling program for salinity in the San Joaquin River. Flow and salinity were monitored, and salt load and salt assimilative capacity were modeled, for three years through December 2002. The goal of the project, to establish the monitoring and modeling framework needed to coordinate the re-operation of fresh water and saline water discharges, was achieved. In conjunction with additional infrastructure and additional participation by dischargers, this framework would help in attainment of water quality objectives while allowing for continued discharge of salt from the basin. The project ended in December 2002 because no funding was available for continued operation. Additional resources from CALFED will be needed to restart this monitoring and modeling effort and to develop other needed infrastructure including temporary storage and rapid discharge facilities.

Grassland Bypass Project: In May 1996, the Regional Board adopted a Basin Plan Amendment for the control of subsurface agricultural drainage. The BPA included a prohibition of discharge of tile drainage to wetland supply channels in the Grassland Watershed. The Grassland Bypass Project was implemented to comply with this prohibition of discharge. Discharge from the Bypass Project is now regulated through WDRs issued by the Regional Board that have established monthly and annual selenium load limits. Load limits have been reduced by five percent per year for the last four years. Loads will be reduced significantly more (up to 80 percent) when WDRs are updated using load allocations calculated in the San Joaquin River Selenium TMDL. There will likely be a reduction in salt loads along with the reduction in selenium loads.

Management and Oversight

CALFED continued to provide management, coordination and oversight for the DWQP, however staff resources have been very low. As of April 2003, dedicated CALFED resources at the various agencies consist of an interim program manager (at CALFED) and 1.5 PY at DHS. The WRCB / CVRWQCB assigns staff resources as needed to carry out their responsibilities. US EPA has made a staff person available part time on a priority basis.

DHS is currently providing 1.5 PYs of staff resources to CALFED through an Interagency Agreement (IA), which is still going through processing. The IA will expire on June 30, 2004 and there is no continued funding. DHS and CALFED have also been attempting to finalize an IA for \$750,000 to study health effects related to disinfection byproducts. It is unlikely that this IA will be finalized in time to ensure research can be conducted before the funding becomes unavailable.

3. Cross Program Integration and Linkages

Some of the actions of other CALFED program elements could have a greater impact on drinking water quality than the direct actions of the DWQP implementing agencies. Conveyance, Storage, and Ecosystem Restoration actions are particularly important. The DWS has proposed a policy framework to guide mitigation for drinking water quality impacts of CALFED program actions. DWQP representatives should be active participants in any CALFED projects with the potential for significant drinking water quality impacts.

Conveyance

How water moves through the Delta is a critical factor in determining the quality of water that reaches the export pumps. Installation and operation of barriers and channel dredging in the South Delta will change the mix of water that reaches the pumps. Conveyance improvements at the South Delta pumping facilities will allow increased pumping during periods of better water quality. The Delta Cross Channel was constructed and is operated to route more high quality Sacramento River water to central Delta channels and the export pumps. The proposed screened diversion on the Sacramento upstream of the Delta Cross Channel would serve a similar purpose. Assessment of the water quality impacts of these actions requires the use of sophisticated models and extensive water quality monitoring. The DWQP has contributed resources to these modeling efforts and helps to identify water quality issues as planning studies proceed. Future

participation in these projects will probably be limited to commenting on the water quality elements of work plans and reports.

Ecosystem Restoration

It has been known for some time that organic carbon concentrations increase as water moves across the Delta. Delta agricultural drainage and wetlands have been proposed as the major sources of organic carbon in the Delta. Results of recent studies suggest that wetlands maybe a more significant source than previously suspected. Conversion of Delta islands to shallow water habitat or wetlands could increase organic carbon loads to Delta channels and cause a decline in drinking water quality at the export pumps. Modeling of salinity also shows that breaching Delta island levees could have a significant effect on salt transport and concentrations. The likely impact of significant land use, levee, island, and channel changes on drinking water quality needs to be investigated before large-scale restoration projects and plans proceed. The ERP and DWQP also need to coordinate monitoring program and source control activities. ERP and DWQP water quality problems are frequently associated with the same sources indicating the need for cooperative monitoring and source improvement strategies.

Watershed Management

The Watershed Program and DWQP work cooperatively on grant funding processes and have overlapping program objectives. Improved water quality is an important objective of the Watershed Program. Building local capacity for watershed management activities provides the mechanism for identifying, guiding, and implementing drinking water quality improvement projects. For the past two years, the Watershed and Drinking Water Quality Programs, working with the SWRCB, have coordinated their grant funding processes. As an implementing agency for both programs, the SWRCB will continue to be the focus of coordination for these two programs.

Water Use Efficiency

Municipal and agricultural water use efficiency play an important role in water quality. Where wastewater is treated, reduced flow reduces waste loads and increases the effectiveness of treatment. Reduced demand can increase in stream flows increasing water quality for all beneficial uses. Water recycling can reduce loads of some pollutants to receiving waters. In the Delta, reduced demand and increased freshwater flow reduce salinity intrusion. An important element of both programs is promotion of good water measurement and management by agricultural users. Water Use Efficiency is identified as an important element in the ELPH diagram.

Levees

The Delta's levee system provides important protection against salinity intrusion. There have been uncontrolled levee breaches during flood events that caused salt water influxes severe enough to stop water exports for extended periods. Levees should be constructed and maintained to survive reasonably foreseeable natural disasters.

Storage

Storage projects can have positive or negative effects on Delta Water Quality. The construction of the major dams of both the State and federal water projects greatly reduced seasonal fluctuations in Delta salinity. Additional storage north of the Delta is likewise expected to have

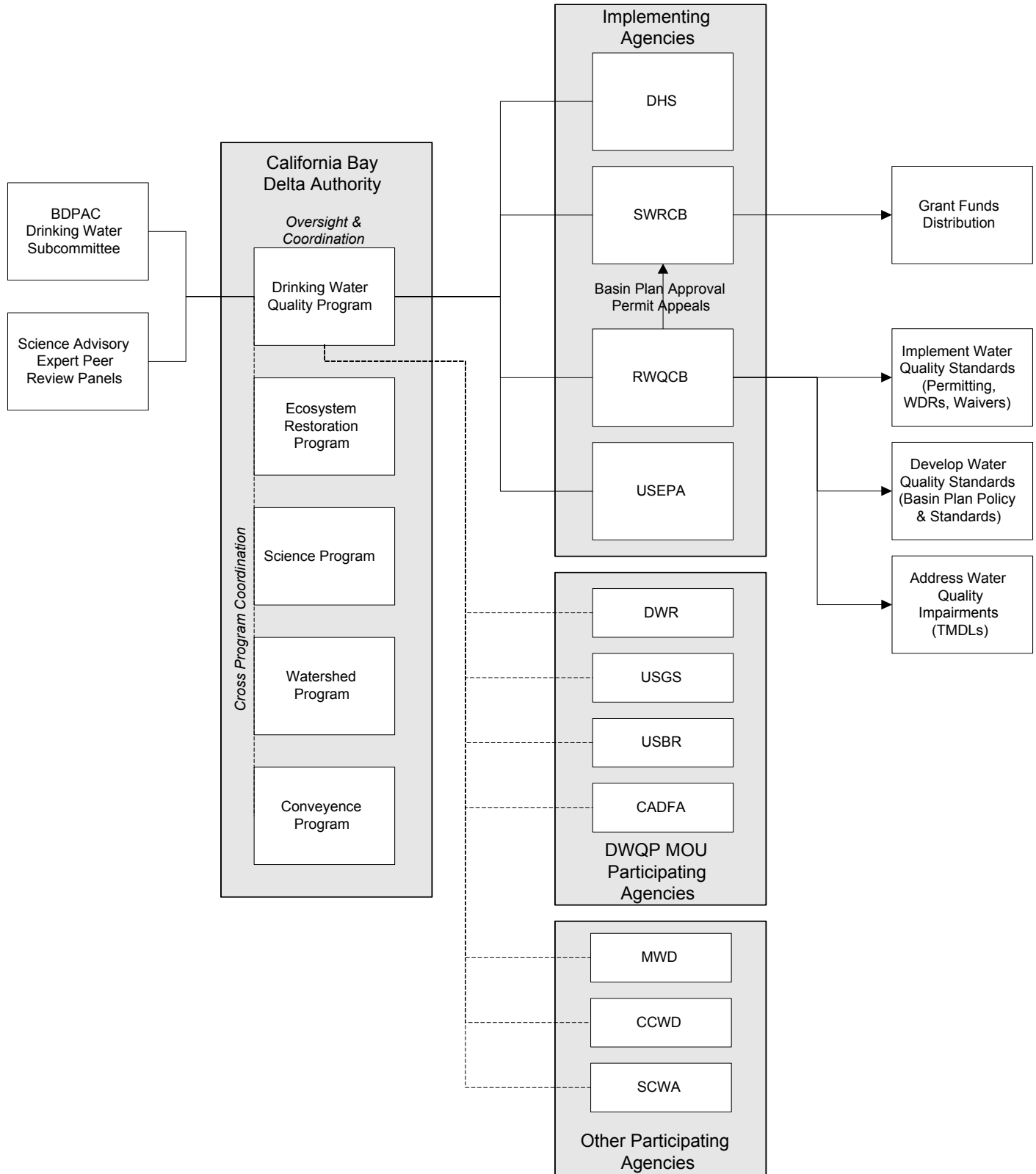
water quality benefits. On the other hand, feasibility studies of the proposed in-Delta storage project show that it could increase loadings of some pollutants.

Science

Science plays a very important role in the DWQP because management decisions depend heavily on monitoring data, scientific investigations, computer modeling, and other technical information. The Science Program is helping the DWQP to establish a panel of experts to review the effectiveness of the program and program objectives. These experts would also be available help the program identify knowledge gaps and give advice.

4. Institutional Structure

CALFED Drinking Water Quality Program Organizational Chart



Organization Role / Responsibility

	CALFED DWQP	Program coordination and oversight, cross-program integration. Support DWS.
Implementing Agencies		
	DHS	State co-lead. Management of treatment technology development efforts, health effects studies.
	SWRCB	State co-lead. Management of grant funds distribution.
	CVRWQCB	State co-lead. Management of source protection efforts.
	US EPA	Federal lead. Administration of Clean Water Act and Safe Drinking Water Act via state agencies.
Participating Agencies		
	DWR	
	USGS	
	USBR	
	CDFA	
BDPAC		
	DW Subcommittee	Review program progress and advise policy directions.
	Science Advisory Expert Review Panels	
CALFED Program Elements		
	Ecosystem Restoration	
	Science	
	Watersheds	
	Conveyance	

5. Look Forward

This section is the plan of action for the program for years 4 through 7. The program has made good progress on some ROD commitments but will need to expand on others to achieve program goals. The BDPAC Drinking Water Subcommittee “Equivalent Level of Public Health Protection” (ELPH) concept has been proposed as the framework for the next program strategy. Development of this strategy will be one of the primary tasks for the DWS in year 4 and will guide subsequent program implementation.

a. Description of Strategy / Tasks

The implementing agencies with CBDA Drinking Water Quality staff will oversee completion of projects initiated in previous years and coordinate with continuing programs doing work on ROD commitments and complimentary actions. The agencies

and staff will also be responsible for ROD implementation commitments including public participation, science, and environmental justice.

The primary source of funding for drinking water quality actions in years 4-7 will be the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Prop 50). None of the Prop 50 funds for water quality are designated for the CBDA. As has been the case in years 2 and 3, it is anticipated that the primary mechanism for implementation of the program will be through competitive grants. The SWRCB, DHS, and DWR all plan to conduct grant funding processes in Years 4-7 using Prop 50 funds. Since these funds are available statewide and may address any water quality issues, and none of the remaining Prop 50 funding has been specifically designated for the DWQP, the amounts for the program are unknown.

As the attached Prop 50 expenditure plan indicates, specific sections of the bond are designated for treatment technology and water quality improvements. These correspond to the Source Improvement and Treatment Options boxes in the ELPH diagram. The DWQP will work with the implementing agencies to develop program priorities and selection criteria for these funds.

The CALFED Storage, Conveyance, Levees, Water Supply Reliability, Ecosystem Restoration, Watershed, and Water Use Efficiency programs will be funded directly from Prop 50. The DWQP will coordinate with

The following is a description of planned continuing work on ROD commitments and complimentary actions.

San Joaquin Valley Agricultural Drainage

DWR Agricultural Drainage Program (salinity and selenium): DWR will continue its drainage program including management and coordination, monitoring and evaluation, on-farm drainage reduction, treatment, integrated drainage management and environmental investigations. DWR will also manage Proposition 204 Drainage Reuse Sub-account projects.

Source Control

Monitoring and Assessment: CALFED Monitoring and Assessment Program (MAP): There are three primary goals for the MAP. 1) Develop a trends monitoring program that will indicate if drinking water quality is changing over time and identify where changes are taking place. This will be one of the primary sources of information for program performance indicators. 2) Develop a program of studies, conceptual models, numerical models, workshops, and reports that will answer questions about sources, fate, transport, and management of contaminants of concern. 3) Improve access to information related to drinking water quality in the CALFED solution area. The overall program schedule is as follows:

Year 4: Complete conceptual models for the primary contaminants of concern, white papers on selected contaminants, and selection of analytical tools (computer models).

Year 5: Complete data collection and monitoring to supply information needed by the selected model or models and conduct initial model runs.

Year 6: Complete the basic network of trends monitoring stations.

Years 6 and 7: Apply the selected models and report results.

Year 7: Evaluate source controls and program progress using information from the MAP.

Sacramento River Watershed Program: In 2003, US EPA will be providing an additional \$270,000 in federal funds to continue the program.

Drinking Water Policy for the Delta and its Tributaries: Years 4-7 will be devoted to implementation of the work plan. The work plan provides a “roadmap” to be followed for the next 4 to 6 years. The final product of the working group will be a comprehensive policy proposal that will be provided to the Regional Board for their regulatory adoption (possibly in the form of a Basin Plan Amendment).

Drinking Water Subcommittee (DWS): The Subcommittee plans to focus on three areas:

1. A draft Policy Framework on water quality
2. Development of a Strategic Plan for the Drinking Water Quality Program
3. Resources to carry out the CALFED Drinking Water Quality Program

The DWS will also conduct an initial assessment of progress toward meeting water quality targets and alternative treatment technologies by the end of 2003.

Treatment Technology

Ultraviolet (UV) Light Disinfection (MWD Project): The project duration is 24 months, so it should be completed by mid to late 2004.

UV Light Disinfection (CCWD Project): Advanced Treatment of Delta Water to Meet Future Regulations. This is a second UV disinfection project and will be funded with \$700,000 in federal funds through US EPA beginning in late 2003. The primary objective of this project is to aid utilities using Delta water in developing compliance strategies through modification of existing facilities, and installation of new treatment processes.

Regional Desalination:

Agricultural drainage water recycling using membrane technology by Panoche Drainage District (CALFED grant). The project will begin in Year 4 and be completed by Year 7.

Desalination Research and Innovation Partnership (DRIP): A MWD project intended to demonstrate innovative desalination technologies to treat a variety of brackish and high salinity wastewaters. The program has already resulted in the development of advanced reverse osmosis (RO) membranes. DRIP is an eight-year program and will be completed by 2006.

Control Run-off into Conveyances:

State Water Project Watershed Sanitary Survey: The Sanitary Survey report identified areas of additional monitoring as well as watershed protection needs for various watersheds of the State Water Project. Ongoing efforts, such as the Arroyo Passajero project and assessment of runoff into conveyances will continue. Future work includes an update report for 2006, as well as the development of modeling tools to track sources and loads of contaminants in the project. Current efforts for the watershed projects are 100% SWP funded (exception: Arroyo Passajero).

North Bay Aqueduct

Main recommended BMP – livestock fencing within the watershed: It is unknown when Solano County Water Agency (SCWA) will get the authorization to start expenditures. This project can be completed within one year of authorization to proceed. The SCWA is committed to ongoing monitoring, at the SCWA's cost after completion of the grant.

Alternate intake for the North Bay Aqueduct: By the end of calendar year 2003, SCWA will present the results to the California Department of Health Services, Department of Water Resources and CALFED to determine the next steps. At these future next steps SCWA will include additional public involvement and potentially the start of the CEQA process. These activities are done at local expense.

Operational Improvements/ Recirculation in the San Joaquin River

USBR funding source has not been determined. DWR does not have an anticipated role in Years 4-7. Contingent upon funding being identified, USBR will conduct sediment sampling, economic analysis, legal analysis, additional fisheries study, public involvement, and final documentation.

Bay Area Water Quality and Supply Reliability Program

In Year 4, Phase 2 will be completed with the remaining funds from SB 23 through the ABAG contract unless these funds are not extended. In that case, funds from Prop 50 will need to be substituted. Tasks for Year 4 include completion of the analysis and evaluation of those results to identify alternatives or portfolios that group a variety of alternatives together that meet the objectives of the various Bay Area agencies (by February 2004). As Phase 2 nears completion, the Bay Area water districts involved in the project will need to work closely with other Bay Area stakeholders and CALFED

agencies to determine how to proceed with Phase 3, environmental review, feasibility, and design.

San Joaquin Valley / Southern California Water Quality Exchanges

Both the Friant and Kings Partnerships are moving towards investigating specific projects that will facilitate water quality exchanges. In December 2003, Friant and Metropolitan Water District (MWD) approved a Phase 2 Workplan that has a budget of \$3 million. Soon, MWD will be amending the existing Kings Workplan to address funding specific projects.

Plan to Meet Delta Water Quality Standards

In years 4-7, the South Delta Improvements Project will transition from environmental documentation to final design and finally construction of the proposed barriers. Environmental mitigation and enhancement will be functions of construction and permitting. Two other programs/projects are either completed or are no longer funded: Real Time Monitoring and Management of Salinity and the Grasslands Bypass Project.

Management and Oversight

Program management will transition from CALFED to DHS and SWRCB/CVRWQCB as state co-leads and US EPA as federal lead. Staff resources and the role Proposition 50 will play need to be identified.

b. Implementation Commitments

The DWQP has incorporated CALFED Science, Environmental Justice, and Public Involvement principles into all major program elements. Current activities include:

- Environmental Justice and Tribal interests are important selection criteria in the grant funding processes.
- Environmental justice representatives on the BDPAC Drinking Water Subcommittee.
- CBDA Science Program advice on important DWQP tasks including Delta Drinking Water Policy development, the DWQP Monitoring and Assessment Program, establishing a drinking water expert panel, and developing performance indicators.
- Public participation and information are provided through the Drinking Water Subcommittee, the DWQP web site and project specific public information and outreach activities.

c. Science and Performance Evaluation

There are several key ROD milestones that will depend heavily on the availability of reliable scientific information about the Bay-Delta system. There are a number of critical unknowns for the program including:

1. The TOC and bromide targets in the ROD are intended to protect public health by reducing disinfection byproduct formation. Is TOC the most appropriate measure of disinfection byproduct formation potential?
2. How can source control, water management, and treatment be used most effectively in to reduce risk from disinfection byproducts, pathogens, and other pollutants of concern?
3. What are the long-term trends in ambient concentrations and loads of the drinking water program pollutants of concern (organic carbon, bromide, pathogens, turbidity, salinity, and nutrients)?
4. How will large scale and long term changes to the system affect source water quality? For example: How will increasing population and urbanization of the Central Valley impact source water quality?

The DWQP will establish an expert panel to advise the Drinking Water Subcommittee and the program on the science aspects of these management questions and ROD milestones. The following ROD milestones will include scientific review or will be developed cooperatively with the Science Program:

Description	Due
Comprehensive monitoring and assessment program	beginning of '03
Determine if additional protective measures needed	end of '04
Assess of progress on targets and treatment technologies	end of '03
Final assessment of progress	end of '07
Evaluate full scale treatment implementation	beginning of '07

Performance Measurement - The program is committed to gathering information about water quality and other measures of program success. This is one of the primary objectives of the monitoring and assessment program. The program 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.

d. Regional Description

Sacramento Valley – Since the Sacramento Valley is the source of about 60% of the water flowing into the Delta, it is also an important source drinking water pollutants of concern. Monitoring done by the Sacramento River Watershed Program and others indicates that agriculture, urban runoff, and municipal wastewater treatment plants are the most significant sources of pollutants. The primary goal of the program in the Sacramento Valley is to reduce loads of the pollutants concern to the maximum extent practicable. This will be accomplished by identifying sources, quantifying loads, and working with the implementing agencies to establish management practices or improved wastewater treatment where necessary. The program is funding a study of the effect of urbanization on a watershed in the Sacramento Metropolitan area to assess the importance of urban runoff. Monitoring, assessment, and development of best management practices for agriculture are priorities for current year grants program.

San Joaquin Valley – As the source of the remainder of the flow into the Delta the San Joaquin Valley is also an important source of pollutants of concern. For most of these pollutants,

concentrations are much higher in San Joaquin River water than in the Sacramento. Irrigated agriculture, animal feeding operations, managed wetlands, and urban areas are the most likely land uses contributing pollutants to the system. Like the Sacramento, identification, quantification, and implementation of source reduction measures are important objectives. There is also a specific ROD commitment to address agricultural drainage problems in the San Joaquin Valley. The program has funded a several projects to addresses runoff/drainage in this region and will continue to make this a priority for current and future funding.

Delta – Water quality leaving the Delta is significantly worse than water quality in the tributaries for the DWQP target pollutants (TOC and bromide). High bromide concentrations are almost entirely due to seawater intrusion from San Francisco Bay. This is a natural process for an estuary and is only controlled through careful water management. There is good evidence that about half of the organic carbon load in exported water originates within the Delta. Agriculture on Delta island peat soils and tidal wetlands are thought to be the most important sources within the Delta. Objectives for the Delta include:

- Quantification of organic carbon loads from agriculture and wetlands.
- Investigating management practices and other ways to mitigate organic carbon release.
- Assessing the drinking water impacts of changing Delta Cross Channel operations, South Delta barriers, In-Delta Storage, levee modifications, and other water management actions in the Delta.
- Investigating the occurrence and significance of pathogens in the Delta.
- Addressing water quality problems at the North Bay Aqueduct.

San Francisco Bay Area – The Bay Area is a major consumer of Delta water. Program actions and objectives are centered on water quality blending/exchange and drinking water treatment technology. The program is helping Bay Area water suppliers to research and develop alternative treatment technologies to meet the unique challenges of using Delta water. The Bay Area Water Quality and Supply Reliability Program (BAWQSRP) is working with water suppliers to implement the program and investigate infrastructure and institutional means for improving drinking water quality. The BAWQSRP is in Phase 2 of 3 and is anticipated to continue well past the end of 2005. Bench scale and pilot scale projects are underway for innovative treatment technologies. Additional work to identify optimal treatment strategies is planned for Year 4.

Southern California – Southern California is the other major consumer of Delta water. Its issues are similar to those of the Bay Area. In addition, included here are actions to protect water quality in the State Water Project canals, reservoirs, and similar facilities even though much of this system is located in the San Joaquin Valley. The program has initiated an effort to address runoff into conveyances and has funded projects to reduce pollution entering the California Aqueduct and reservoirs in the system. The program is also funding studies of pollutant sources and research on treatment technologies to address the concerns and needs of Southern California water suppliers. Program objectives for Southern California are to improve the quality of exported water, provide technical assistance on treatment technologies, and protect water quality in conveyances.

6. Long-Term Expenditure Plan

The proposed Year 4 budget for the DWQP is \$5.6 million. Additional funding for DWQP goals and commitments is expected from Prop 50 but the amount is unknown.

7. Long-Term Schedule

See the attached diagram from the January 2003 tracking report shows ROD milestones for years 4-7.

