State Water Resources Control Board, Central Valley Regional Water Quality Control Board, and San Francisco Bay Regional Water Quality Control Board

Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

July, 2008

June, 2008 version with changes approved by the State Water Board on July 16, 2008.

STATE OF CALIFORNIA
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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2008-0056

STRATEGIC WORKPLAN FOR ACTIONS TO PROTECT BENEFICIAL USES OF THE SAN-FRANCISCO BAY/SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

WHEREAS:

1. Resolutions were adopted by the State Water Resources Control Board (State Water Board – Resolution 2007-0079), Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board – Resolution R5 2007-0161), and the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Regional Water Board – Resolution R2 2008-0009) (collectively Water Boards) on December 4, 2007, December 6, 2007, and January 30, 2008, respectively, committing to take various actions to protect beneficial uses in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta).

2. The above-mentioned resolutions directed staff to prepare a strategic workplan that prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the Bay-Delta.

3. Water Boards' staff have prepared the June 2008 *Draft Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* that describes a suite of priority activities the Water Boards will pursue over the next five years to address the water supply and environmental crisis in the Bay-Delta. Workplan activities are responsive to priorities identified by the Governor and Delta Vision, and touch on a wide range of flow-related and water quality actions to better protect the Bay-Delta and the public trust, while still protecting diverse public interests.

4. In the future, emerging information or modified recommendations from the Governor, Delta Vision, or other sources may warrant reevaluating activities identified in the strategic workplan.

5. The Central Valley Regional Water Board and San Francisco Bay Regional Water Board will consider adopting the draft strategic workplan later this year.

THEREFORE BE IT RESOLVED THAT:

1. The State Water Board adopts the June 2008 *Draft Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*.

2. Water Boards staff will provide quarterly updates to the Water Boards on implementation of the strategic workplan and, as appropriate, recommend modifying activities in the workplan to ensure that Water Boards' actions continue to protect beneficial uses in the Bay-Delta.

3. The Water Boards will consider modifying the Bay-Delta strategic workplan as necessary to protect beneficial uses in the Bay-Delta.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 16, 2008.

AYE:	Chair Tam M. Doduc Vice Chair Gary Wolff, P.E., Ph.D Arthur G. Baggett, Jr. Charles R. Hoppin Frances Spivy-Weber
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

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Acronyms and Abbreviations

Bay-Delta	San Francisco Bay/Sacramento-San Joaquin Delta
Bay-Delta Plan	Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Estuary
BDCP	Bay-Delta Conservation Plan
BGA	Blue-Green Algae
BMPs	Best Management Practices
CCWD	Contra Costa Water District
CDO	Cease and Desist Order
CEQA	California Environmental Quality Act
cfs	cubic feet per second
Commission	California Fish and Game Commission
Council	Pacific Fisheries Management Council
CTR	California Toxics Rule
CVP	Central Valley Project
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
D-1485	State Water Resources Control Board Decision 1485
D-1641	State Water Resources Control Board Decision 1641
Delta	Sacramento-San Joaquin River Delta
DFG	California Department of Fish and Game
DICU	Delta Island Consumptive Use
DO	Dissolved Oxygen
DPH	California Department of Public Health
DPR	California Department of Pesticide Regulation
DRMS	Delta Risk Management Strategy
DWR	California Department of Water Resources
EC	electrical conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ERP	Ecosystem Restoration Program
EWMPs	Efficient Water Management Practices
IEP	Interagency Ecological Program
ILRP	Irrigated Lands Regulatory Program
JPOD	Joint Points of Diversion
mmhos/cm	milliohms per centimeter
MOU	memorandum of understanding
NOAA Fisheries	National Marine Fisheries Service
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
OCAP	Operations Criteria and Plan
OEHHA	Office of Environmental Health Hazard Assessment
OP	Organophosphorus
PCB	Polychlorinated Biphenyls

Regional Water Board	Regional Water Quality Control Board
RMP	Regional Monitoring Program
ROD	Record of Decision
SDFPF	Skinner Delta Fish Protective Facility
SDIP	South Delta Improvements Program
SJRA	San Joaquin River Agreement
SQOs	Sediment Quality Objectives
SRFC	Sacramento River Fall Run Chinook Salmon
SRWTP	Sacramento Regional Wastewater Treatment Plant
State Water Board	State Water Resources Control Board
Suisun Marsh Plan	Suisun Marsh Habitat Management, Preservation, and Restoration Plan
SWP	State Water Project
TFCF	Tracy Fish Collection Facility
TMDL	Total Maximum Daily Load
UC Davis	University of California, Davis
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
VAMP	Vernalis Adaptive Management Plan
Water Boards	State Water Board, Central Valley Regional Water Board, and San Francisco Bay Regional Water Board
WDRs	Waste Discharge Requirements

Executive Summary

Resolutions adopted by the State Water Resources Control Board (State Water Board – Resolution 2007-0079), Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board – Resolution R5 2007-0161), and the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Regional Water Board – Resolution R2 2008-0009) (collectively Water Boards) on December 4, 2007, December 6, 2007, and January 30, 2008, respectively, direct staff of the Water Boards to prepare a strategic workplan that both describes the actions the Water Boards will complete to protect beneficial uses of water in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) and provides timelines and resource needs for implementing the actions.

Workplan activities are divided into the nine broad elements described below. These elements cover a range of actions that: 1) implement the Water Boards' core water quality responsibilities; 2) continue meeting prior Water Board commitments; 3) are responsive to priorities identified by the Governor and the Delta Vision Blue Ribbon Task Force; and 4) build on existing processes, such as the Bay Delta Conservation Plan (BDCP). The Water Boards recognize that they have neither the capacity nor the responsibility to conduct all the planning and implementation activities needed to protect and restore fisheries, aquatic habitats, and other beneficial uses in the Bay-Delta. Accordingly, the workplan identifies activities that will need to be coordinated with other efforts. Overall, the workplan identifies a range of actions that constitute a reasonable sharing of responsibility to protect the Bay-Delta and the public trust, while still protecting diverse public interests.

1) **Water Quality and Contaminant Control:** The Water Boards implement a core regulatory program to control the effects of point and nonpoint source pollution throughout California. This workplan element identifies actions beyond the core permitting program that the Water Boards will execute to protect the Delta. Taken together, these actions represent the Water Boards' comprehensive program in the Delta to protect water quality.
    - Develop and Implement Total Maximum Daily Loads (TMDLs)
    - Develop and Implement a Drinking Water Policy for the Central Valley
    - Address Impacts of Once-through Cooling Power Plants
    - Develop Sediment Quality Objectives for Enclosed Bays and Estuaries
    - Invasive Species Management
    - Monitor and Control Factors that Lead to Blue Green Algae Growth
    - Characterize Discharges from Delta Islands and Establish Appropriate Controls
    - Evaluate Effects of Ambient Ammonia Concentrations on Delta Smelt Survival and Algal Primary Production and Control those Effects as Necessary

- Conduct a Selenium Screening Study for the Delta
- Coordinate with the Department of Pesticide Regulation and Delta County Agricultural Commissioners on In-Delta Pesticide Use to Eliminate Pesticide Toxicity in Delta Waters

2) **Evaluation, Development, and Implementation of a Comprehensive Delta Monitoring Program:** This element will ensure that water quality contaminant control programs and water right actions continue to be focused, efficient, and effective.
3) **Review and Implement Southern Delta Salinity and San Joaquin River Flow Objectives:** The State Water Board previously identified review of the southern Delta salinity and San Joaquin River flow objectives included in the Bay-Delta Water Quality Control Plan (Bay-Delta Plan) and their implementation as emerging issues. Reviewing and potentially revising these objectives and their implementation will protect beneficial uses, including fisheries, and provide appropriate San Joaquin River water quality for several parameters, including salinity and dissolved oxygen.
4) **Review and Implement Suisun Marsh Objectives and Take Other Appropriate Actions:** This effort will be coordinated with development of the Suisun Marsh Habitat, Management, and Preservation Plan.
5) **Comprehensive Review of the Bay-Delta Plan, Water Rights, and Other Requirements to Protect Fish and Wildlife Beneficial Uses and the Public Trust:** The State Water Board will review and amend, as appropriate, the objectives and implementation program in the Bay-Delta Plan. Changes in the plan will be implemented in part through a water right decision. The State Water Board will coordinate with the BDCP process in this review to ensure that the information developed pursuant to the BDCP can be used as part of the State Water Board's decision-making processes.
6) **Activities to Ensure that the State Water Project's (SWP) and Central Valley Project's (CVP) Methods of Diversion in the Delta are Reasonable, Beneficial, and Protect the Public Trust:** The State Water Board will evaluate the reasonableness of the SWP's and CVP's methods of diversion and develop and may impose a remedy to address any unreasonable impacts of the methods of diversion if the Department of Water Resources (DWR) and U.S. Bureau of Reclamation (USBR) fail to develop or implement a comprehensive plan (such as BDCP) satisfactory to the State Water Board to address concerns in the Bay-Delta associated with their methods of diversion, or if new information supports immediate action.
7) **Water Right Compliance, Enforcement, and Other Activities to Ensure Adequate Flows to Meet Water Quality Objectives:** To ensure that adequate natural and abandoned flow is available to meet water quality objectives, the State Water Board will employ its statutory responsibilities to investigate whether illegal diversions and other violations of water right permit and license conditions are occurring in the Bay-Delta watershed and take action to address those violations. If adequate natural and abandoned flows continue to be unavailable to meet water quality and flow objectives, the State Water Board may take additional actions, including water conservation

requirements or a proceeding to ensure that natural and abandoned flows are not diverted when they are needed to meet flow objectives.

8) **Actions to Address Water Use Efficiency for Urban and Agricultural Water Users:** The State Water Board will implement a number of actions to address water use efficiency for urban and agricultural water users, consistent with the Governor's direction to achieve a 20 percent reduction in per capita water use statewide by 2020.
9) **Other Actions:** Includes establishing funding for Delta smelt refugia, assessment of the need for fish screens for in-Delta diversions, development and implementation of in-stream flow standards for a Delta tributary, and a salinity management plan for the Central Valley.

Introduction

Resolutions adopted by the State Water Resources Control Board (State Water Board – Resolution 2007-0079), Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board – Resolution R5 2007-0161), and the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Regional Water Board – Resolution R2 2008-0009) (collectively Water Boards) on December 4, 2007, December 6, 2007, and January 30, 2008, respectively, direct staff to prepare a strategic workplan that prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta). This workplan describes a suite of priority activities the Water Boards will pursue over the next five years. These activities complement other ongoing activities and, together, will be implemented to address the water supply and environmental crisis in the Bay-Delta.[1] Workplan activities are responsive to priorities identified by the Governor and Delta Vision, and touch on a wide range of flow and water quality actions to fix and better protect the Bay-Delta and the public trust, while still protecting diverse public interests. This introduction identifies and summarizes the workplan activities and reasons why they are being proposed. Water Board priorities may change based on emerging information or modified recommendations from the Governor, Delta Vision, or other sources.

The workplan identifies a broad, integrated list of activities, organized into modular elements that individually and collectively are meant to achieve the Water Boards' goals. As a strategic-level workplan, the workplan does not contain the detail typically included in a project-level workplan. None of the activities described in these elements has a predetermined outcome. Instead, the workplan identifies processes in which information developed and synthesized under each element will allow the Water Boards to make informed decisions on a wide range of issues. The Water Boards will continue to ensure that their processes are transparent and will solicit public participation during implementation of the workplan. The Water Boards will also continue to coordinate with multi-agency and stakeholder efforts to achieve the goals identified in the workplan, and will not disrupt stakeholder processes. It is hoped, in fact, that implementation of this workplan will encourage the regulated community to consider actions to address these problem areas.

[1] This workplan focuses on the Sacramento-San Joaquin Delta (Delta), but also involves Bay-Delta and Central Valley wide issues.

Impetus for the workplan includes:

- The need within the Water Boards to more fully coordinate their water quality and water rights activities; in 2007 the Water Boards established a Bay-Delta Team to coordinate State and Regional Water Board activities in the Bay-Delta. This team compiled the activities identified in the resolutions and in this workplan.
- Commitments made to address emerging issues identified in the 2006 update to the Water Quality Control Plan for the Bay-Delta (Bay-Delta Plan), including the decline of species in the Delta.
- The need to complement the activities and priorities identified by the Delta Vision Blue Ribbon Task Force, which was created by the Governor's Executive Order S-17-06 to create a durable vision for sustainable management of the Delta.

The Water Boards solicited public comment during the development of the strategic workplan. In addition to comments from stakeholders, the State Water Board received a March 24, 2008 letter from Phil Isenberg, Chair of the Delta Vision Blue Ribbon Task Force, in which the Task Force unanimously recommended that the Water Boards include the following five top priority items in the workplan. These items are included as elements in the workplan:

1) Statewide conservation
2) Use of public trust, reasonable use, and no waste provisions of the Constitution
3) Identify and act on diversions within the Delta and Delta watershed
4) Identify and act on opportunities to integrate Board actions with those of other agencies and private parties to achieve California's policy goals
5) Protect species as part of water flow and water quality determinations

Additionally, Governor Schwarzenegger, in a February 28, 2008 letter to members of the California State Senate, identified seven actions to fix the Delta, four of which require involvement by the Water Boards and are addressed in the workplan:

1) Water conservation
2) Interim actions to help protect and restore Delta habitat
3) Develop and implement a comprehensive program in the Delta to protect water quality
4) Begin the public process to study the alternatives for improving the Delta water conveyance system

Workplan activities fall into nine broad categories or elements. These elements cover a wide range of activities that: 1) are responsive to priorities identified by the Governor and Delta Vision; 2) implement the Water Boards' core water quality responsibilities; and 3) continue meeting prior commitments. The Water Boards recognize that they have neither the capacity, nor in some cases, the

responsibility, to conduct all the planning or all the work needed in the Bay-Delta. Accordingly, the workplan identifies certain activities that will need to be coordinated with the Bay Delta Conservation Plan (BDCP) or other planning efforts. Overall, the elements touch on a wide range of actions that envision a proportional sharing of the responsibility that will be needed if the State is to fix and better protect the Bay-Delta and the public trust, while still protecting diverse public interests.

Selection of these elements is based upon a qualitative assessment of the activities against the following criteria:

- Results in significant positive progress toward protection of beneficial uses in the Bay-Delta
- Ensures that water supplies are put to beneficial use to the fullest extent of which they are capable and will prevent the waste or unreasonable use or unreasonable method of use of water
- Sufficient information exists to support taking or initiating the action
- Complements or adds to existing efforts by the Water Boards or other organizations
- Can be accomplished with existing legal authorities
- Constitutes an existing commitment by the Water Boards

Following are the elements described in this workplan:

1) Water Quality and Contaminant Control
2) Comprehensive Monitoring Program
3) Southern Delta Salinity and San Joaquin River Flow Objectives
4) Suisun Marsh Management, Preservation, and Restoration
5) Comprehensive Review of the Bay-Delta Plan, Water Rights, and Other Requirements to Protect Fish and Wildlife Beneficial Uses and the Public Trust
6) Activities to Ensure that the State Water Project's (SWP) and Central Valley Project's (CVP) Methods of Diversion in the Delta are Reasonable, Beneficial, and Protect the Public Trust
7) Water Right Compliance, Enforcement, and Other Activities to Ensure Adequate Flows to Meet Water Quality Objectives
8) Water Use Efficiency
9) Other Activities

<u>Water Quality and Contaminants Control</u>
This workplan component identifies important actions that the Water Boards have underway or will initiate to protect water quality in the Delta. These actions complement the Water Quality Control Plans (Basin Plans) and other ongoing actions and activities of the Water Boards that together constitute a comprehensive water quality program for the Delta. The workplan component consolidates in one document many of the important Delta water quality actions

in progress or to be implemented by the State Water Board's Division of Water Quality and the Central Valley and San Francisco Bay Regional Water Boards. The primary goal in identifying these, along with other complementary actions, is to ensure that the Water Boards are taking all necessary actions to address water quality impairments that may have a nexus with species declines in the Bay-Delta and water supply impacts. Other ongoing actions on contaminants not specifically highlighted in this workplan include activities associated with directly regulating discharges of waste (e.g. requirements, waivers, enforcement), continuing coordination with the Interagency Ecological Program (IEP), and other programs on Delta water quality issues and coordinating with various grant programs. Activities that are already in progress prior to development of this workplan include:

- Develop and Implement Total Maximum Daily Loads (TMDLs)
- Develop and Implement Drinking Water Policy for the Central Valley
- Address Impacts of Once-through Cooling Power Plants
- Develop Sediment Quality Objectives (SQOs) for Enclosed Bays and Estuaries
- Invasive Species Management
- Monitor and Control Factors that Lead to Blue Green Algae (BGA) Growth

The following activities are already being partially or fully implemented in response to the increased collaboration of the State and Regional Boards to address Bay-Delta issues:

- Characterize Discharges from Delta Islands
- Evaluate Effects of Ambient Ammonia Concentrations on Delta Smelt Survival and Algal Primary Production and Control those Effects as Necessary
- Conduct a Selenium Screening Study for the Delta

The last set of proposed actions have yet to be implemented or little activity has occurred:

- Coordinate with the Department of Pesticide Regulation (DPR) and Delta County Agricultural Commissioners on In-Delta Pesticide Use

<u>Comprehensive Monitoring Program</u>
A comprehensive contaminant monitoring program will ensure that water quality contaminant control programs and water right actions continue to be properly focused and effective. This workplan component will develop a framework for coordinating monitoring and assessment efforts in and around the Delta. New and existing monitoring described in the Water Quality and Contaminants Control element of this workplan will be incorporated into this comprehensive monitoring program. The long-term goal of this element is to develop a comprehensive contaminant monitoring program that will be coordinated with monitoring

conducted as part of the interagency Environmental Monitoring Program that is already required by water right permit and license conditions. The short term goal is to establish a framework for coordinating existing monitoring and assessment efforts and making sure that existing information is synthesized and analyzed on a regular basis.

Southern Delta Salinity and San Joaquin River Flow Objectives

These two linked activities will address two of four emerging issues identified in the State Water Board's 2006 update to the Bay-Delta Plan: 1) Delta and Central Valley salinity; and 2) San Joaquin River flows. In light of pelagic (open water) and other aquatic species declines, judicial decisions, and enforcement issues, it is necessary to review the southern Delta salinity and San Joaquin River flow objectives and their implementation. Revised objectives and implementation may improve protection of beneficial uses including: San Joaquin Basin salmonids, pelagic species and other organisms; and may improve San Joaquin River water quality (salinity, dissolved oxygen (DO), and other constituents). These two activities are linked both by their geography and by the nexus between flow and water quality.

In its 2006 update to the Bay-Delta Plan, the State Water Board identified San Joaquin River flows as an emerging issue requiring additional consideration due to concerns regarding the protection of salmonids and the effect of San Joaquin River flows on pelagic organisms. There is a nexus between flow and water quality for water quality impairments throughout the State, but the lower San Joaquin River is the prime watershed for such a nexus within the Bay-Delta. This nexus exists not just with salinity but also with DO in the Stockton Deep Water Ship Channel portion of the San Joaquin River. The San Joaquin River system merits particular attention because the disproportion of flows into the Delta from the north is one of the primary Delta concerns regarding aquatic species declines, as evidenced by the current US District Court ordered remedy to restrict reverse flows in Old and Middle rivers. Moreover, the San Joaquin River pulse flows are currently being met through an interim experimental program that expires in 2011. Long-term flows need to be considered. In sum, although the State Water Board could review flow needs and objectives for other tributaries to the Bay-Delta, such as the Mokelumne, Cosumnes, or American Rivers, such actions would not have the broad benefit to Bay-Delta flows, Bay-Delta water quality, and public trust protections as actions taken on the San Joaquin River system.

Suisun Marsh Management, Preservation, and Restoration

Water Board staff will participate in the development of the Suisun Marsh Habitat Management, Preservation, and Restoration Plan (Suisun Marsh Plan) as a means of leveraging its water quality control planning functions and to ensure that linkages with other water quality control planning efforts, including BDCP, will be identified and considered. Water supply and beneficial use

protection will need to be balanced in water quality control planning and implementation, and therefore in development of the Suisun Marsh Plan.

Comprehensive Review of the Bay-Delta Plan, Water Rights and Other Requirements to Protect Fish and Wildlife Beneficial Uses and the Public

The State Water Board's 2006 Bay-Delta Plan identified two other emerging issues that need to be addressed: climate change; and the pelagic organism decline. Climate change and associated sea level rise, paired with the high likelihood of catastrophic earthquakes and flooding, put water supplies dependent upon the Delta at risk. New data confirm that a number of fish species are continuing to decline due to water diversions, contaminants, and invasive species. These issues are more expansive than those addressed by the Water Boards' typical water quality control planning efforts. The problems and solutions involve land use planning and development of major new infrastructure. The strategy needed to address these threats was developed as part of the State's Delta Risk Management Strategy (DRMS). The vision for broadly addressing the threats, including land use issues, is being developed as part of Delta Vision. BDCP is a planning effort to develop near-term and long-term measures to recover and restore at risk species, primarily fisheries, and their habitats in the Delta while improving the reliability of SWP, CVP, and other water supplies. The BDCP effort may be complementary to the State Water Board's water quality control planning.

The information developed in these efforts is vital to the State Water Board's water quality control planning and implementation for the Bay-Delta. The State Water Board will coordinate with BDCP to ensure that the information it needs to consider any new plans or interim remedies, which may be proposed through the BDCP process, is developed as part of that process. If this work were not being done by BDCP, the State Water Board would need to initiate and direct a similar effort.

Activities to Ensure that the SWP's and CVP's Methods of Diversion in the Delta are Reasonable, Beneficial and Protect the Public Trust

Much of the impetus for Delta Vision and BDCP is concern that the SWP's and CVP's methods of diversion in the southern Delta may not be secure and sustainable and may be having adverse impacts on fish and wildlife and other beneficial uses of water in the Delta. While it is anticipated that BDCP will address these issues, the State Water Board cannot guarantee BDCP's success. At the same time, the State Water Board has a responsibility pursuant to the California Constitution and the Water Code to take action to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water in California. Consequently, the State Water Board will monitor the BDCP process and use information developed through that process to decide whether to take any action regarding the reasonableness of the Department of Water Resources' (DWR) and the U.S. Bureau of Reclamation's (USBR) methods of diversion. It is anticipated that the BDCP will be developed

by the end of 2010 and implemented by DWR, USBR, and other parties thereafter. If DWR and USBR fail to develop or implement a plan satisfactory to the State Water Board to address concerns with their methods of diversion, or if new information supports immediate action, the State Water Board may undertake a water right proceeding to evaluate the reasonableness of the SWP's and CVP's methods of diversion and to develop a remedy to address any unreasonable impacts of the methods of diversion.

Water Right Compliance, Enforcement, and Other Activities to Ensure Adequate Flows to Meet Water Quality Objectives

Increasing demands on water from the Bay-Delta and its tributaries and mounting environmental concerns have intensified the need for the State Water Board to vigorously enforce water right requirements to ensure that sufficient flows are available to meet water quality objectives and to prevent DWR's, USBR's, and other parties developed water supplies from being impacted. To ensure that adequate natural and abandoned flow is available to meet water quality objectives, the State Water Board will employ its statutory responsibility to investigate whether illegal diversions are occurring in the Bay-Delta watershed and take action to address those illegal diversions. Concurrently, compliance inspections of permitted and licensed water rights will be performed to assess overall existing rights and compliance with terms and conditions. If and when illegal diversions are found, diverters will be subject to enforcement action and they will be directed to cease diversions, obtain a legal water right, or pursue a contract for water supplies with DWR, USBR, or another party. If adequate natural and abandoned flows continue to be unavailable to meet water quality and flow objectives, the State Water Board may take additional actions. Water conservation requirements will be considered as will a proceeding to ensure that natural and abandoned flows are not diverted when they are needed to meet flow objectives.

Water Use Efficiency

Water conservation reduces the demand for water throughout the State, thus assisting in the protection of beneficial uses in the Bay-Delta and promoting the reasonable and efficient use of the State's limited water resources. This element is responsive to the Governor's direction to reduce per capita water use statewide by 20 percent by 2020. The State Water Board will implement a number of actions to address both water use efficiency and conservation for both urban and agricultural water users:

- Adopt regulations that require water suppliers to provide an incentive to urban water users to conserve water and eliminate waste or unreasonable use of water.
- Conduct adjudicative proceedings for two areas or suppliers with high water use, one urban and one agricultural, to determine the reasonableness of such use and to prevent the waste, unreasonable use

of water, unreasonable method of use, and unreasonable method of diversion of water.
- Work with a multi-agency team to develop a State strategy to achieve the goal of reducing per capita water use by 20 percent statewide by 2020.
- Prepare a report to the Legislature to evaluate the feasibility, estimated costs, and potential means of financing a coordinated water measurement database.
- Adopt a State policy for water quality control to require the development of Water Recycling Plans and substantial increases in water recycling.

Other Activities

The Water Boards will need to adaptively plan and initiate new activities based on new information and new direction. The Water Boards are already involved in four additional activities that don't easily fall into the major workplan elements:

- Work with the Department of Fish and Game (DFG) to establish and ensure the implementation of in-stream flow requirements for priority California streams, including a Delta tributary, to protect public trust resources.
- Oversight of the effort to develop a delta smelt refuge including oversight of State Water Board funds used to support this effort
- On-going assessment of needs for fish screens for Delta diversions
- Salinity Management Plan for the Central Valley (Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS))

Additional activities that are identified during the on-going planning of Bay-Delta actions will be placed in this category as needed.

Workplan Timeline and Resource Needs

Figure 1 is a timeline of the activities included in this strategic workplan. Current activities and substantially new activities are identified. Additional work will occur in many cases beyond the times shown but specific activities are not yet clearly defined. Table 1 and Table 2 summarize the staff and contract resources needed, respectively, to implement elements of this workplan. Not all resource needs are explicitly identified; existing resources are indicated as "e" if the work for that activity is already being performed as part of an existing program, but is not quantified. Not all activities and resources currently expended on activities related to Bay-Delta water quality are summarized in these tables. The Regional Water Boards expend significant additional resources performing their baseline water quality functions including, but not limited to, work on National Pollutant Discharge Elimination System (NPDES) and irrigated lands programs. Although most resources are already available to implement the work described, some redirection of resources and acquisition of new resources will be needed to complete all of the activities.

TMDL resources in Table 1 reflect the total resources needed for TMDL development and implementation in the Central Valley Region but does not include all TMDL resources for the Bay Area Region. Resources for activities that are not fully defined or fully committed to are not identified in the resources tables, including the additional resources needed to complete Phase III SQO efforts targeting fish and wildlife and future CV-SALTS activities.

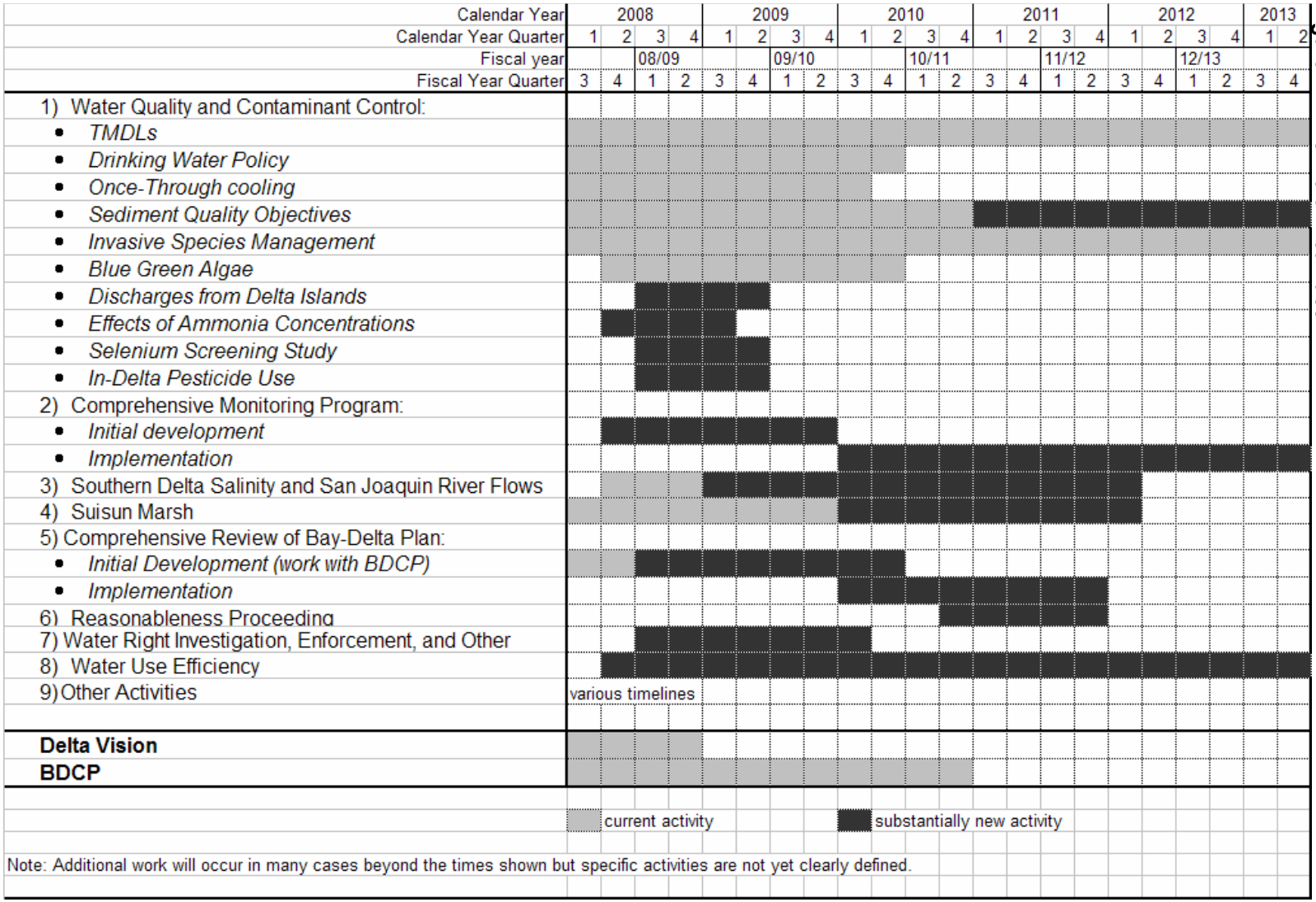

Figure 1. Timeline of Activities

Table 1. Total Staff Resources

Workplan Elements	Fiscal Year 08/09	09/10	10/11	11/12	12/13
1) Water Quality and Contaminant Control:	Staff resources in personnel years (PYs)				
• *TMDLs*	19.5	19.5	*tbd*	*tbd*	*tbd*
• *Drinking Water Policy*	0.5	0.5	*tbd*	*tbd*	*tbd*
• *Once-through cooling*	1.5	*na*	*na*	*na*	*na*
• *Sediment Quality Objectives*	1.0	1.0	0.5	*tbd*	*tbd*
• *Invasive Species Management*	1.0	1.0	1.0	1.0	1.0
• *Blue Green Algae*	0.3	0.3	*na*	*na*	*na*
• *Discharges from Delta Islands*	0.5	0.5	*tbd*	*tbd*	*tbd*
• *Effects of Ammonia*	0.2	*tbd*	*na*	*na*	*na*
• *Selenium Screening*	0.1	*na*	*na*	*na*	*na*
• *In-Delta Pesticide Use*	0.3	0.3	0.3	0.3	0.3
2) Comprehensive Monitoring Program:					
• *Initial development*	0.5	0.5	*na*	*na*	*na*
• *Implementation*	0.0	*tbd*	*tbd*	*tbd*	*tbd*
3) San Joaquin River Flow and Southern Delta Salinity	3.0	3.0	3.0	3.0	*tbd*
4) Suisun Marsh Objectives	0.8	0.8	1.5	1.5	1.5
5) Comprehensive Review of Bay Delta Plan	3.0	3.0	4.0	4.0	*tbd*
6) Reasonableness Proceeding	*na*	*na*	2.0	1.0	*tbd*
7) Water Right Investigation, Enforcement, and Other Activities to Ensure Flows	1.5	6.0	1.0	*tbd*	*tbd*
8) Water Use Efficiency	2.9	3.5	3.0	3.3	3.5
9) Other Activities	0.0	0.0	*tbd*	*tbd*	*tbd*
Total	38.1	40.4	14.3	13.1	8.3

na = no activity planned at this time
tbd = activities identified but specific resource needs still to be determined
x = some activity planned but no resource needs anticipated at this time

Table 2. Total Contract Resources

Workplan Elements	Fiscal Year 08/09	09/10	10/11	11/12	12/13
1) Water Quality and Contaminant Control:	*Contract resources in thousand dollars*				
• *TMDLs*	600	*tbd*	*tbd*	*tbd*	*tbd*
• *Drinking Water Policy*	*x*	*tbd*	*tbd*	*tbd*	*tbd*
• *Once-through cooling*	*x*	*tbd*	*tbd*	*tbd*	*tbd*
• *Sediment Quality Objectives*	250	250	*tbd*	*tbd*	*tbd*
• *Invasive Species Management*	*x*	*x*	*x*	*x*	*x*
• *Blue Green Algae*	*e*	*tbd*	*tbd*	*tbd*	*tbd*
• *Discharges from Delta Islands*	500	500	*na*	*na*	*na*
• *Effects of Ammonia*	70	*tbd*	*tbd*	*tbd*	*tbd*
• *Selenium Screening*	30	*na*	*na*	*na*	*na*
• *In-Delta Pesticide Use*	x	70	70	70	70
2) Comprehensive Monitoring Program:					
• *Initial development*	350	*tbd*	*na*	*na*	*na*
• *Implementation*	*na*	*tbd*	*tbd*	*tbd*	*tbd*
3) San Joaquin River Flow and Southern Delta Salinity	700	700	700	600	0
4) Suisun Marsh Objectives	*Coordinate with element #3*				
5) Comprehensive Review of Bay Delta Plan	*Coordinate with element #3*				
6) Reasonableness Proceeding	*na*	*na*	*tbd*	*tbd*	*tbd*
7) Water Right Investigation, Enforcement, and Other Activities to Ensure Flows	*x*	*x*	*x*	*tbd*	*tbd*
8) Water Use Efficiency	200	*tbd*	*tbd*	*tbd*	*tbd*
9) Other Activities	*x*	*tbd*	*tbd*	*tbd*	*tbd*
Total	2,700	1,520	770	670	70

na = no activity planned at this time
e = using existing resources (not quantified) for this activity
tbd = activities identified but specific resource needs still to be determined
x = some activity planned but no resource needs anticipated at this time

Organization of this Document

The Introductory section of this document provides a discussion of the purpose and objectives of the strategic workplan, the criteria used to determine which actions should be included in the strategic workplan, and a description of how the Water Boards intend to ensure success in implementing the strategic workplan.

The background section provides a brief description of the Bay-Delta and a description of water development, contaminants in the Delta, invasive species, and fishery declines. Background is also provided on other major activities in progress to address concerns in the Bay-Delta: Delta Vision, BDCP, CALFED, and DRMS. The background section concludes with a description of the Water Boards' current efforts to protect beneficial uses in the Bay-Delta, including formation of the Bay-Delta Team and adoption of the resolutions directing preparation of this strategic workplan.

The Workplan Element sections describe the goal(s); objective(s); impetus; background; scope; activities, products, timelines; and resources for each workplan element. The Water Boards' core water quality and contaminants control activities that are discussed first include: statewide and regional plans and policies; TMDLs; various water quality investigations; coordination with other agencies and stakeholders; and other measures. A comprehensive monitoring program for the Delta that integrates water quality monitoring with monitoring required pursuant to water rights is discussed next. Finally, various activities to review and potentially modify the Bay-Delta Plan and its implementation measures are discussed followed by water right compliance and enforcement activities, water use efficiency, and other activities.

Purpose of the Strategic Workplan

The purpose of this strategic workplan is to describe the suite of high priority activities the Water Boards plan to pursue in coordination with stakeholders and other agencies and planning efforts for the next five years in the Bay-Delta and its tributaries. The strategic workplan addresses the Water Boards' activities in the Bay-Delta as defined in the Bay-Delta Plan with a focus on addressing the crises in the Delta. For each element, the strategic workplan describes the scope of individual activities and the general timelines and resource needs for implementing coordinated activities in the Bay-Delta, including the activities listed in the State and Regional Water Board resolutions discussed below. Most of the activities identified in the resolutions and discussed below constitute existing commitments by the Water Boards for which workplans already exist. However, many do not. To the extent that activities have existing workplans in place, this strategic workplan refers to those plans for detailed discussion concerning the action. For those actions for which a workplan does not exist, additional detail is provided concerning the general timeline and strategy that will be employed to

complete the activity. Project level workplans are not provided, but may be provided in the future for certain actions. In addition, as conditions warrant, changes may be made to the suite of activities the Water Boards pursue.

Objectives of the Strategic Workplan

The objectives of the strategic workplan are to identify actions that will make the best use of the Water Boards' resources to protect beneficial uses by addressing ecosystem, water quality, and water supply issues in the Bay-Delta and its tributaries. The strategic workplan identifies the high priority activities the Water Boards will pursue to protect beneficial uses and how those activities will be coordinated with other public processes. In addition, the strategic workplan is intended to provide interested persons with information concerning the Water Boards' planned activities.

Criteria for Determining High Priority Activities

In order to prioritize the activities the Water Boards intend to pursue in the Bay-Delta, the following criteria were considered. Though a qualitative analysis was conducted to determine what activities would be pursued, a ranking was not assigned.

- Protection of Beneficial Uses: The activity will result in significant positive progress toward protection of beneficial uses.
- Full and Reasonable Use of Water: The activity will ensure that water supplies are put to beneficial use to the fullest extent of which they are capable and will prevent the waste or unreasonable use or unreasonable method of use of water.
- Timely: The activity is ripe for prompt action because sufficient information exists to support taking the action.
- Complements Other Activities: The activity will complement or add to existing efforts by the Water Boards or other organizations.
- Existing Authority: The activity can be accomplished with existing legal authorities.
- Existing Commitment: The activity constitutes an existing commitment by the Water Boards.

Ensuring Success

Some of the activities described in the strategic workplan will provide immediate benefits. Many activities, however, will require substantial work, time, and cooperation by other agencies and stakeholders to produce meaningful results. In order to assure that the Water Boards have identified a suite of activities that protects beneficial uses and are appropriately implementing the activities described in the strategic workplan, Water Board staff will continually monitor and assess the activities, implementation measures, and timelines in this strategic workplan, and propose course corrections as appropriate. Specifically, upon

completion of the Delta Vision Strategic Implementation Plan, the Water Boards will reevaluate this strategic workplan to assure that it sufficiently complements that effort. In addition, the Water Boards will continue to monitor the BDCP process, CALFED, DRMS, and other processes, to assure that the Water Boards are pursuing the proper set of activities in the correct timeframe. The Water Boards will also monitor, track, and respond to emerging issues related to protection of beneficial uses and propose any suitable course corrections.

To ensure continued coordination, the Bay-Delta Team will continue to meet on a regular basis. Water Board staff will also provide quarterly updates to the Water Boards on implementation of the strategic workplan and, as appropriate, recommendations for course corrections as needed.

While the activities in this strategic workplan do not assume or rely upon future legislation or additional resources, additional legislation and resources may be pursued as appropriate to more effectively accomplish the objective of this strategic workplan to protect beneficial uses of the Bay-Delta.

Background

The Bay-Delta includes the Sacramento-San Joaquin Delta, Suisun Marsh and San Francisco Bay. The Delta is composed of about 738,000 acres of which about 48,000 acres are water surface area; Suisun Marsh comprises approximately 85,000 acres of marshland and water ways; and San Francisco Bay includes about 306,400 acres of water surface area. The Delta and Suisun Marsh are located where California's two major river systems, the Sacramento and San Joaquin rivers, converge to flow westward, meeting incoming seawater from the Pacific Ocean through San Francisco Bay. The Delta is bordered by the cities of Sacramento to the north, Stockton and Tracy to the south, and Pittsburg to the west. This former wetland area has been reclaimed into more than 60 islands and tracts that are now devoted primarily to farming. The Delta is interlaced with about 700 miles of waterways. A network of levees protects the islands and tracts from flooding, most of which lie near or below sea level.

The Sacramento and San Joaquin river systems drain about 40 percent of California's water supporting a variety of beneficial uses. The Bay-Delta Estuary is one of the largest, most important estuarine systems for fish and waterfowl production on the Pacific Coast of the United States. About 90 species of fish are found in the Delta. The Delta's channels serve as a migratory route and nursery area for chinook salmon, striped bass, white and green sturgeon, American shad, and steelhead trout. These anadromous fishes spend most of their adult lives either in the lower bays of the estuary or in the ocean. The Delta is a major nursery area for most of these species. Other resident fishes in the estuary include delta smelt, longfin smelt, Sacramento splittail, catfish, largemouth bass, black bass, crappie, and bluegill.

Water Development in the Bay-Delta

Water from the Delta supports about $400 billion dollars of the State's $1.5 trillion dollar economy. The watershed of the Bay-Delta Estuary provides a portion of the drinking water to 25 million people in the Bay Area, Central Valley, and Southern California and water to over 3.7 million acres of irrigated farmland, including some of the State's most productive agricultural areas, both inside and outside of the Estuary north and south of the Delta. Depending on the water year type, water projects in the Delta can divert anywhere from 20 percent to over 70 percent of the natural flow. It is estimated that 7,000 permitted water operations divert water from sources feeding into the Bay-Delta, of which 600 diversions are within the legal boundary of the Delta. Many other diversions (perhaps thousands) also exist, but are either not required to obtain a permit from the State Water Board (e.g. riparian and pre-1914 appropriative diverters) or are operating illegally.

The Central Valley Project and the State Water Project

The Delta is the hub of California's two largest water distribution systems – the CVP, operated by USBR and the SWP, operated by DWR. In 1961 the State Water Board's predecessor, the State Water Rights Board, gave USBR approval to operate the CVP and divert water from the Delta at a rate of 4,600 cubic-feet per second (cfs). In 1967 the State Water Board gave approval to DWR to operate the SWP and to divert water from the Delta at a rate of 10,250 cfs. Collectively known as the Projects, the CVP and SWP deliver water to two-thirds of California's population and millions of acres of farmland. Water for the Projects is stored in reservoirs upstream of the Delta, and transported to pumping facilities in the southern Delta through the San Joaquin and Sacramento rivers.

DWR and USBR operate the Skinner Delta Fish Protective Facility (SDFPF) and the Tracy Fish Collection Facility (TFCF) respectively to salvage fish diverted at the pumping facilities. The TFCF began operation in 1957 and the SDFPF began operation in 1968. The fish collection facilities were initially designed to salvage juvenile striped bass and chinook salmon. While improvements have been made since initial construction of the facilities, the ability of the facilities to salvage Delta smelt and other smaller pelagic (open water) fishes is minimal.

Contra Costa Water District

The Contra Costa Water District (CCWD) is the largest in Delta municipal diverter, serving approximately 550,000 people in central and eastern Contra Costa County. CCWD diverts water as a Central Valley Project contractor and also under its own water rights, with about two-thirds of its water supply diverted at the screened Old River Intake and most of the remaining supply diverted at the Rock Slough Intake. In some years, a small amount of water is also diverted at the screened Mallard Slough Intake. CCWD's Old River Intake fish screen is the most protective screening facility at any current Delta intake. To further improve water quality for its customers, CCWD is building a fourth intake on Victoria Canal with a screen similar to the Old River screen.

Delta Power Plants

In addition to water supply projects, there are also two power plants owned and operated by Mirant Delta, LLC that divert water from the Delta. The Contra Costa Plant is located on the southern shore of the San Joaquin River near the City of Antioch, and the Pittsburgh Power Plant is located on the southern shore of Suisun Bay near the City of Pittsburg. Both power plants use once-through cooling operations and divert water from the San Joaquin River and Suisun Bay respectively, and then return their heated effluent to the Delta. During full operation, the maximum amount of water diverted by both plants combined is 1,460 cfs, but the actual amount diverted is usually much lower than that since the plants are only operated to meet higher load demands.

Contaminants in the Bay-Delta

Water quality in the Bay-Delta has been a concern for the Water Boards for as long as the Boards have existed. Over the years the contaminants and discharge sources have changed and there have been significant improvements in controlling most types of contaminants. Nevertheless, there still are a suite of contaminants and source categories that pose a concern for some Delta beneficial uses and there is also concern for an emerging list of new contaminant categories (pharmaceuticals and endocrine disrupters).

Contaminants and other forms of water pollution in the Delta impair wildlife and aquatic life, drinking water, and agriculture beneficial uses. Contaminants in water and sediment affect aquatic organisms through direct toxicity or indirectly by reducing habitat suitability, food supply, or fitness. Degraded Delta water quality also adversely affects drinking water quality, requiring users of Delta water to provide advanced treatment and increasing risk to public health. Agriculture beneficial uses also are impacted by water quality degraded with high salinity. As a result, the Bay-Delta is listed as impaired for a variety of toxic contaminants including pesticides, mercury, toxicity, and oxygen demanding substances that cause critically low dissolved oxygen (DO). In addition, there is concern that a number of emerging contaminants could impact beneficial uses such as heavy metals and other naturally occurring elements, pharmaceuticals and endocrine disrupting compounds, and BGA blooms. Sources of these contaminants include agricultural, municipal and industrial wastewater, and urban stormwater discharges, discharges from wetlands and channel dredging activities.

The Water Boards have regulatory programs that control discharges of wastes from wastewater treatment facilities, industrial facilities, urban areas, irrigated agricultural lands, dredging operations and other sources of wastewater to the Bay-Delta and tributaries. If a single discharger is responsible for an impairment, the Water Boards can address the impairment by taking appropriate regulatory action (revising the permit, taking enforcement action, etc). The Water Boards address water quality impairments that are caused by multiple dischargers by developing TMDLs, which set water quality objectives or targets and allocate allowable loads to sources of contaminants. TMDLs have been adopted and are in the process of being implemented for various constituents in the Delta and the Bay as discussed below. TMDLs are implemented through WDRs in discharge permits and conditional waivers of WDRs. For the past several years, some funding has been available for implementing TMDLs through grant programs. Implementation of TMDLs has reduced levels of some contaminants in the Delta. For example, the incidences of toxicity due to organophosphorus (OP) pesticides have significantly declined compared to observations in the early 1990's.

Despite the efforts of the Water Boards to control contaminants, recent declines in the abundance of pelagic species in the Delta have heightened concern about contaminants in the Delta and the role they might play in the declines. The Water Boards are initiating additional focused actions to address this heightened concern. Focused actions are targeted toward ensuring that adopted TMDLs are efficiently implemented and that new TMDLs are adopted in a timely manner, evaluating the potential impacts of pyrethroid pesticide and ammonia concentrations in Delta waters on organisms, increasing coordination of monitoring and assessment efforts, increasing oversight of regulated dischargers, decreasing response time to toxic incidences, and working with researchers to address water quality problems associated with blue-green algae blooms in the Delta.

Invasive Species in the Bay-Delta

Invasive aquatic organisms are known to have deleterious effects on the Bay-Delta ecosystem. These effects include reductions in habitat suitability, reductions in food supply, alteration of the aquatic food-chain, and predation on or competition with native species. There are many notable examples of exotic species invasions in the Bay-Delta, so much so, that the Bay-Delta has been labeled “the most invaded estuary on earth.”

Of particular importance potentially in the recent decline in pelagic organisms is the introduction of the Asian clam, *Corbula amurensis*. The introduction of the clam has lead to substantial declines in the lower trophic production of the Bay-Delta estuary. In addition to reductions in planktonic production caused by Corbula, the planktonic food web composition has changed dramatically over the past decade or so. Once dominant copepods in the food web have declined leading to speculation that estuarine conditions have changed to favor alien species. The decrease in these desirable copepods may further increase the likelihood of larval fish starvation or result in decreased growth rates. The proliferation of invasive aquatic weeds, such as *Egeria densa*, which filter out particulate materials, and further reduce planktonic growth are also having a significant impact on the Bay-Delta. In addition, native fishes in the Bay-Delta face growing challenges associated with competition and predation by non-native fish.

Fishery Declines

Pelagic Organism Decline

In 2005, scientists with IEP announced observations of a precipitous decline, beginning in 2002, in several pelagic organisms in the Delta, including delta smelt, striped bass, longfin smelt and threadfin shad in addition to declining

levels of zooplankton.[2] Scientists hypothesized that at least three general factors may be acting individually, or in concert, to lower pelagic productivity: 1) toxic effects; 2) exotic species effects; and 3) water project effects. In response to the decline, the IEP formed a workgroup to investigate the causes of the decline. The Delta Smelt Action Plan was prepared in 2005 and the Pelagic Fish Action Plan was prepared in March of 2007 to identify actions being implemented or under active evaluation to help stabilize the Delta ecosystem and improve conditions for pelagic fish species. In December of 2007, Federal District Judge Oliver Wanger issued an Interim Remedial Order in *Natural Resources Defense Council v. Kempthorne* finding that the U.S. Fish and Wildlife Service's Biological Opinion for the effects on delta smelt of the 2004 Long-Term Central Valley Operations Criteria and Plan (OCAP) was inadequate. The order restricts DWR's and USBR's diversions in the Delta while a new biological opinion is being prepared. As a result of the order, water exports could be reduced by up to 35 percent this year. A revised biological option is expected in September of 2008.

Central Valley Salmon Declines

In January of 2008, the Pacific Fisheries Management Council (Council) reported unexpectedly low chinook salmon returns to California in 2007, in particular to the Central Valley. Adult returns to the Sacramento River, the largest of Central Valley chinook salmon runs, failed to meet resource management goals (122,000-180,000 spawners) for the first time in 15 years. The projected 2008 Sacramento River fall chinook salmon (SRFC) escapement to the Central Valley is 59,000 adults, assuming no further fishing in 2008. The National Marine Fisheries Service (NOAA Fisheries) has determined that poor ocean conditions are a major factor contributing to the low 2008 SRFC abundance; however, other conditions may exacerbate these effects. NOAA Fisheries expects these poor conditions to continue to affect SRFC escapements in the near future.

In April, both the Council and the California Fish and Game Commission (Commission) adopted the most restrictive ocean and coastal salmon seasons ever for California by closing the ocean and coastal fishery to commercial and recreation fishing. In May, the Commission further banned salmon fishing in all Central Valley rivers, with the exception of limited fishing on a stretch of the Sacramento River

In addition to the fishing bans discussed above, in April of 2008, Judge Oliver Wanger found that the NOAA Fisheries biological opinion for the effects of the OCAP on salmonids to be arbitrary and capricious. (*Pacific Coast Federation of Fishermen's Assns. v. Gutierrez*.) A remedy has not yet been ordered.

[2] Zooplankton are the primary food source for older life stages of species such as delta smelt.

Other Efforts to Address Concerns in the Bay-Delta

The Bay-Delta Estuary has been dramatically affected by human activities beginning as early as the mid-1800s with gold mining, flood protection, land reclamation, and other activities that have lasting impacts today. Previous and current urban and agricultural practices contribute contaminants to the ecosystem. Water project operations have altered the natural amount, duration, direction, and timing of water flows through the Bay-Delta. In addition, hundreds of exotic species have been intentionally or accidentally introduced into the Bay-Delta. Due to the numerous and competing demands for water from the Bay-Delta and its tributaries, protection of beneficial uses has been, and continues to be, a challenge on numerous fronts. Particularly, over the past several years, concerns related to protection of beneficial uses have intensified due to the decline of pelagic organisms and other aquatic species (most recently Central Valley salmon), increased urbanization, levee stability concerns, effects of climate change and sea level rise, and other ecosystem, water quality, and water supply related concerns. Currently, several major efforts are underway to address these issues, including, but not limited to, those discussed below.

Delta Vision

In 2006, Governor Schwarzenegger established the Delta Vision Blue Ribbon Task Force to "develop a durable vision for sustainable management of the Delta" with the goal of "...managing the Delta over the long term to restore and maintain identified functions and values that are determined to be important to the environmental quality of the Delta and the economic and social well being of the people of the State." The Governor also directed the Task Force to develop a Strategic Implementation Plan by October 2008. In January of 2008, the Task Force released the Delta Vision Final Report. The report finds that current patterns of use of Delta resources are unsustainable and that changes in the Delta and California's use of its resources are inevitable. The Delta Vision process addresses water, land use, environmental, and institutional elements necessary to achieve a desired solution. The Vision includes the following twelve integrated and linked recommendations:

1. *The Delta ecosystem and a reliable water supply for California are the primary, coequal goals for sustainable management of the Delta.*
2. *The California Delta is a unique and valued area, warranting recognition and special legal status from the State of California.*
3. *The Delta ecosystem must function as an integral part of a healthy estuary.*
4. *California's water supply is limited and must be managed with significantly higher efficiency to be adequate for its future population, growing economy, and vital environment.*
5. *The foundation for policymaking about California water resources must be the longstanding constitutional principles of "reasonable use" and "public trust"; these principles are particularly important and applicable to the Delta.*

6. *The goals of conservation, efficiency, and sustainable use must drive California water policies.*
7. *A revitalized Delta ecosystem will require reduced diversions—or changes in patterns and timing of those diversions upstream, within the Delta, and exported from the Delta at critical times.*
8. *New facilities for conveyance and storage, and better linkage between the two, are needed to better manage California's water resources for both the estuary and exports.*
9. *Major investments in the California Delta and the statewide water management system must integrate and be consistent with specific policies in this vision. In particular, these strategic investments must strengthen selected levees, improve floodplain management, and improve water circulation and quality.*
10. *The current boundaries and governance system of the Delta must be changed. It is essential to have an independent body with authority to achieve the co-equal goals of ecosystem revitalization and adequate water supply for California while also recognizing the importance of the Delta as a unique and valued area. This body must have secure funding and the ability to approve spending, planning, and water export levels.*
11. *Discouraging inappropriate urbanization of the Delta is critical both to preserve the Delta's unique character and to ensure adequate public safety.*
12. *Institutions and policies for the Delta should be designed for resiliency and adaptation.*

In addition to the above long-term recommendations, the Vision also includes several near-term actions that focus on preparing for disasters in or around the Delta, protecting its ecosystem and water supply system from urban encroachment, and starting work soon on short-term improvements to both the ecosystem and the water supply system.

The Delta Vision Blue-Ribbon Task Force is currently preparing its Strategic Implementation Plan for the Vision. The first draft of the plan will be released in June. The final plan will be released to the Legislature and the Governor in October with a report to the Governor and Legislature in December.

Bay-Delta Conservation Plan

The BDCP is being developed through a voluntary collaboration of State, federal and local water agencies and owners of power plants in the Delta[3] under section 10 of the federal Endangered Species Act, the Natural Community Conservation Planning Act, California Fish and Game Code, and the California Endangered

[3] DWR, USBR, the Metropolitan Water District of Southern California, the Kern County Water Agency, the Santa Clara Valley Water District, Alameda County Flood Control and Water Conservation District, Zone 7 Water Agency, the San Luis and Delta Mendota Water Authority, the Westlands Water District, and Mirant Delta (known collectively as the Potentially Regulated Entities).

Species Act. The BDCP is being prepared with the participation of the water agencies and power plant owners, State and federal fisheries agencies, the State Water Board and various stakeholders, including environmental groups, the Farm Bureau and CCWD. The participating organizations are members of the Steering Committee that is helping to guide preparation of the BDCP. The regulatory agencies, including the fisheries agencies and the State Water Board are participating in the Steering Committee to provide input on issues of concern and guidance on information needs, but are not acting as advocates for certain alternatives.

The purpose of the BDCP is to develop near-term and long-term measures to recover and restore at-risk species, primarily fisheries, in the Delta while improving the reliability of SWP, CVP, and other water supplies. Successful completion of the BDCP approval process will result in long-term regulatory coverage pursuant to State and federal endangered species laws for covered activities, including certain water operations of the SWP and CVP, and operations of the participating Delta power plants. The BDCP is also intended to meet the long-term obligations of most of the potentially regulated participants pursuant to endangered species requirements of the State and federal fisheries agencies.

The BDCP participants plans to achieve their ecosystem and water supply objectives through a number of anticipated actions including: habitat restoration and enhancement to increase the quality and quantity of habitat in the Delta; other conservation actions to help address a number of stressors on covered species; conveyance facilities to enhance operational flexibility and water supply reliability while providing greater opportunities for habitat improvements and fishery conservation (including consideration of a peripheral aqueduct); water operations and management actions to achieve conservation and water supply goals; and a comprehensive monitoring, assessment and adaptive management program. The BDCP is also intended to provide for the conservation of covered species within the planning area; to protect and restore certain aquatic, riparian and associated terrestrial natural communities that support the species being considered; and to provide for water supplies and ecosystem health within a stable regulatory framework. BDCP specifies that other beneficiaries may also be identified during the planning process. The BDCP is currently considering the following four options:

- Existing Through Delta Conveyance: includes use of existing through-Delta conveyance with physical habitat restoration in the north and west Delta and Suisun Marsh.

- Improved Through Delta Conveyance: Includes improving through-Delta conveyance with operable barriers on some channels, separating water supply conveyance flows from the San Joaquin River, and providing

habitat restoration in the north, west, central and south Delta and Suisun Marsh.

- Dual Conveyance: Includes improved through Delta Conveyance with the addition of an isolated conveyance facility from the Sacramento River to the south Delta export facilities with habitat restoration in the north, west, central, and south Delta and Suisun Marsh.

- Peripheral Aqueduct: Includes construction of a peripheral aqueduct from the Sacramento River to the south Delta export facilities, which would allow habitat restoration throughout the Delta and Suisun Marsh.

DWR, NOAA Fisheries, USFWS, and USBR also have initiated the preparation of a joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). This environmental review process is being conducted separately from the BDCP planning process, including the hiring of a different consulting team to conduct the environmental analyses. DWR is the lead agency pursuant to CEQA and NOAA Fisheries, USFWS, and USBR are co-lead agencies pursuant to NEPA. The State Water Board, DFG, and other federal, state, and local agencies are responsible agencies. Work on the EIR/EIS is being directed by the lead agencies with detailed input from the responsible agencies. The environmental review conducted to meet the requirements of CEQA and NEPA for purposes of the lead and responsible agencies is likely to require different information and analyses than that being prepared through the BDCP planning process by the PREs through the technical workgroups. The plan prepared by the PREs will likely be one alternative analyzed in the EIR/EIS. However, other alternatives must also be analyzed to satisfy the requirements of CEQA and NEPA. Additionally, federal, state, and local entities may have their own statutory and regulatory requirements for the BDCP related activities. State Water Board staff have specifically requested DWR to evaluate, as part of its CEQA analyses, potential changes to water quality objectives included in the Bay-Delta Plan to protect fish and wildlife and other beneficial uses of water, which are discussed in detail later in this document. DWR has committed to include such analyses in the EIR/EIS being prepared for BDCP.

In March of 2008, DWR released a Notice of Preparation (NOP) and began CEQA scoping for the BDCP. During 2008, BDCP plans to focus on: developing biological goals and objectives; identifying existing ecological conditions; identifying habitat restoration and conservation actions; analyzing different water conveyance approaches; selecting appropriate methods for scientific analysis; addressing in-Delta water quality; creating an organizational structure for plan implementation; and developing an adaptive management and monitoring program. The basic overall conservation strategy for the BDCP is scheduled to be available by the end of 2008, with a draft of the full plan available by the

middle of 2009. A draft EIR/EIS on the BDCP is scheduled to be released for public review by the end of 2009. The BDCP Steering Committee anticipates that the BDCP will be approved, and provide a basis for authorization to lawfully take threatened and endangered species by the end of 2010.

CALFED

In August of 2000, the CALFED Record of Decision (ROD) and an accompanying memorandum of understanding executed by State and federal implementing agencies were finalized. These documents represented an agreement that all parties would work collaboratively toward achieving balanced improvements in the Delta. In addition to four program objectives, the ROD also established 11 program elements, including a science program, to improve and increase the scientific basis for sound decision-making.

The primary four objectives established by the CALFED ROD are: to expand water supplies to ensure efficient use of the resource through an array of projects and approaches; to improve water quality from source to tap for 25 million Californians who receive at least some of their drinking water from the Delta; to improve the health of the Bay-Delta system through restoring and protecting habitats and native species; and to improve Bay-Delta levees to provide flood protection, ecosystem benefits and protection of water supplies needed for the environment, agriculture, and urban uses.

Two years after the ROD was signed, the State Legislature established the California Bay-Delta Authority as the governing oversight body of CALFED. Two years later, in 2004, Congress authorized federal participation in CALFED. Due to the fact that the California Bay-Delta Authority did not have any real authority to direct the 24 other CALFED implementing agencies, all of which had their own organizational priorities and values, CALFED has not been successful in meeting many of its objectives. In addition, CALFED was unable to develop the means to measure its progress. As a result, in May 2005, the Governor called for an independent review to help CALFED refocus and to enable it to deal with issues about its operation and emerging crises in the Delta. Based on recommendations from that review, a 10-Year Action Plan was crafted, which serves as an informal update of the CALFED ROD. CALFED is working on achieving the goals set forth in the review. The most notable of these goals were to establish a strategic planning function and develop program performance measures. A new Strategic Planning Division was formed, which brings CALFED closer to meshing its end of Stage 1 efforts with the Governor's Delta Vision initiative as it unfolds.

As part of CALFED, the Ecosystem Restoration Program (ERP) Conservation Strategy is being developed to identify restoration opportunities within the Delta and Suisun Marsh ecological restoration zones based on existing elevations, soil types, habitats, and natural process requirements of pelagic organisms and other

native fish species. During 2007, the ERP implementing agencies were developing the Conservation Strategy to guide future ecosystem restoration implementation based on evaluation of past actions, new information, and changing understanding of the ecosystem. The Strategy is a guidance document for future ecosystem restoration implementation and is non-regulatory and based on willing seller participation. To date, the effort has focused on the Delta due to the emphasis focused on it by the pelagic organism decline and other planning efforts. In future versions of the Strategy, comparable conservation strategies will be developed for the entire ERP focus area including the Sacramento and San Joaquin river watersheds.

Delta Risk Management Strategy

Levees in the Delta are at risk of failure due to several factors. Many of the local levees started out as 3 to 5-foot-high dikes of peat over a century ago. Over time, the weight of the levees compressed and displaced the soft, organic soils beneath them. In addition, the organic soils within the island interiors oxidized and were removed by wind over time, resulting in the land surface significantly subsiding and the need to continually raise and broadened the levees until the levees and their foundations stabilize (many reaches have not yet stabilized to date). Delta levees today are now commonly 15 to 20 feet high, and often protect island interiors that are 10 to 15 feet below sea level. Permeable lenses in the levee and foundation, together with historic relics, such as abandoned pipes, and constant burrowing by various mammals also commonly result in seepage and internal erosion. In addition, the Delta is located near the highly seismic San Francisco Bay Area, which poses a significant threat to levee integrity.

In an effort to address these threats, included in the Preferred Program Alternative for Stage 1 of the CALFED ROD is completion of a DRMS. The purpose of DRMS is to examine sustainability of the Delta by assessing major risks to the Delta resources from floods, seepage, subsidence, and earthquakes. In addition, DRMS is tasked with evaluating the consequences, and developing recommendations to manage the risk.

In addition to the CALFED ROD, Assembly Bill (AB) 1200 (Water Code section 139.2 et seq) requires that DWR evaluate the potential impacts on water supplies derived from the Delta based on 50-,100-, and 200-year projections for each of the following possible impacts: subsidence, earthquakes, floods, climate change and sea level rise, or a combination of the above. The DRMS work is being tailored to provide the majority of this required information.

In January of 2008, DWR and DFG released a report titled “Risks and Options to Reduce Risks to Fisheries and Water Supply Uses of the Sacramento/San Joaquin Delta” that summarizes progress on evaluations of potential impacts, improvements, and options for fishery and water supply uses of the Delta that

have been initiated since passage of AB 1200. The report also emphasizes the need to continue evaluations into 2008. During the first half of 2008, DRMS plans to finalize its analysis of the risks of levee failure and risk-reduction strategies and to provide that information to other Delta planning efforts including: Delta Vision, BDCP, and the CALFED ERP.

Water Boards Activities

In response to growing concerns related to protection of beneficial uses in the Bay-Delta and the many efforts underway to address them, staff from the State Water Board, Central Valley Regional Water Board, and San Francisco Bay Regional Water Board formed a Bay-Delta Team to develop a coordinated and comprehensive plan to address protection of beneficial uses in the Bay-Delta. In addition to other efforts, the Bay-Delta Team developed a resolution that reaffirms the Water Boards' commitments to thoroughly and promptly address impacts to beneficial uses of water in the Bay-Delta and to coordinate those efforts with other interested stakeholders.

On December 4, 2007, December 6, 2007, and January 30, 2008, the State Water Board, Central Valley Regional Water Board, and San Francisco Regional Water Board, respectively, adopted resolutions (which were effectively the same) committing to various water quality and water rights related actions to protect beneficial uses of the Bay-Delta. The resolutions directed Water Board staff to work with stakeholders and interested persons, including participants in Delta Vision, BDCP, CALFED, and DRMS processes, to prepare a strategic workplan that prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the Bay-Delta, including the activities listed in the resolutions and summarized below:

Actions Already Committed to in the Resolutions

- Develop and implement CV-SALTS (Resolve #3)
- Act on DWR request to change Order WR 2006-0006 (Resolve #3)
- Enforce the southern Delta salinity objectives and take other corrective actions (Resolve #3)
- Pursue a contract to review the southern Delta salinity objectives in the Bay-Delta Plan (Resolve #3)
- Require characterization of discharges to and from Delta islands for water quality purposes (Resolve #8)
- Conduct screening studies of potential impacts of ammonia and implement appropriate regulatory controls (Resolve #9)
- Implement standardized monitoring program for BGA blooms and develop any appropriate regulatory controls (Resolve #10)
- TMDLs or other actions addressing water quality impairments (Resolve #11)

    - Require management plans to address exceedances of OP pesticide objectives and evaluate water quality impacts from replacement products
    - Complete the final San Joaquin River Stockton Deep Water Ship Channel DO TMDL allocation
    - Evaluate low DO conditions in Old and Middle rivers and prioritize development of a TMDL
    - Negotiate a management agency agreement with USBR to implement a real-time salinity management program by August of 2008
    - Develop and adopt salt and boron water quality objectives in the San Joaquin River upstream of Vernalis, and an associated TMDL.
    - Develop and adopt a selenium TMDL in the Delta and northern San Francisco Bay
    - Adopt a TMDL for mercury in the Delta and begin implementation along with the existing TMDL for mercury in San Francisco Bay
    - Adopt and implement a pathogen TMDL for Stockton urban area
    - Adopt a polychlorinated biphenyls (PCB) TMDL for San Francisco Bay and the westernmost Delta
- Compile and assess available data on contaminants and toxicity to determine if contaminants are contributing to the pelagic organism decline and develop a short and long-term toxicity response program (Resolve #12)
- Ensure a delta smelt refuge population is sustained (Resolve #13)
- Encourage DPR to expedite pyrethroid pesticide re-registration process and associated activities (Resolve #14)
- Develop and adopt a Delta drinking water policy by the end of 2009 (Resolve #15)
- Adopt and implement sediment water quality objectives for enclosed bays and estuaries (Resolve #16)
- Develop and adopt policy to implement Clean Water Act section 316(b) (33 U.S.C. § 316(b)) (once-through cooling policy); impose appropriate NPDES permit conditions on power plants consistent with the once-through cooling policy; consider other interim regulatory actions to address potential impacts of power plants (Resolve #17)
- Develop and implement regulatory controls to address the introduction of invasive species and other pollutants from ballast water discharges and other vessel-related vectors (Resolve #18)
- Participate in development of the Suisun Marsh Plan; consider making any necessary changes to the Bay-Delta Plan, water right permit and license conditions, and take other appropriate actions (Resolve #19)
- Address the use of water use efficiency to promote the efficient use of water protection of beneficial uses in the Strategic Plan update (Resolve #20)
- Use agreement with the University of California to assure that activities and actions are based upon sound science (Resolve #21)

Actions to Be Evaluated and Further Defined in the Strategic Workplan

- In the strategic workplan, the Water Boards staff will propose for the State Water Board's consideration the scope of a basin planning and water right process to review and, as appropriate, amend the southern Delta salinity objectives or their implementation, while ensuring that agricultural uses are protected, and allocate responsibility for meeting the objectives. (Resolve #3)
- The Water Boards will assess the pelagic organism decline synthesis report, the revised delta smelt biological opinion, and other information regarding the pelagic organism decline. The State Water Board held a workshop in January of 2008 to identify specific actions that should be taken to address the pelagic organism decline. As part of the strategic workplan, the Water Boards staff will propose for the State Water Board's consideration a timeline to review and amend, as appropriate, the Bay-Delta Plan to provide additional protection to pelagic organisms and other species and, following notice and opportunity for hearing, water rights permit or license requirements. The Water Boards will also implement other water quality actions based on this assessment. Short term actions will be taken as appropriate. (Resolve #4)
- The Water Boards will assess DFG's San Joaquin River salmon escapement model, Vernalis Adaptive Management Plan (VAMP) experimental data and information, and other information regarding San Joaquin River flows needed to protect beneficial uses. The State Water Board will hold a workshop in the summer of 2008 on San Joaquin River flow issues. As part of the strategic workplan, the State Water Board staff will propose for the State Water Board's consideration a timeline to review and, as appropriate, amend the San Joaquin River flow objectives or their implementation. (Resolve #5)
- Through the strategic workplan, the State Water Board will consider a proceeding to: (1) protect public trust resources and balance competing demands for water in and from the Bay-Delta; and (2) evaluate the reasonableness of the SWP's and CVP's method of diversion from the Delta. (Resolve #6)
- The Water Boards staff will propose for the Water Boards' consideration a comprehensive long-term Delta-wide monitoring program to provide data on contaminants in sediments, water, and aquatic organisms. The San Francisco Bay Regional Monitoring Program (RMP) will be used as a model for this program. This monitoring program will be integrated into current monitoring efforts such as the San Joaquin River Basin Monitoring Partnership and monitoring conducted by the IEP.

Workplan Elements

Water Quality and Contaminants Control

The Water Boards have regulatory programs that control discharges of wastes from wastewater treatment facilities, industrial facilities, urban areas, irrigated agricultural lands, dredging operations and other sources of wastewater to the Bay-Delta and tributaries. If a single discharger is responsible for an impairment, the Water Boards can address the impairment by taking appropriate regulatory action (revising the permit, taking enforcement action, etc). The Water Boards address water quality impairments that are caused by multiple dischargers by developing TMDLs, which set water quality objectives or targets and allocate allowable loads to sources of contaminants. TMDLs have been adopted and are in the process of being implemented for various constituents in the Delta and the Bay as discussed below. TMDLs are implemented through WDRs in discharge permits and conditional waivers of WDRs. For the past several years, some funding has been available for implementing TMDLs through grant programs. Implementation of TMDLs has reduced levels of some contaminants in the Delta. For example, the incidences of toxicity due to OP pesticides have significantly declined compared to observations in the early 1990's.

Despite the efforts of the Water Boards to control contaminants, recent declines in the abundance of pelagic species and other issues in the Delta have heightened concern about contaminants in the Delta. The Water Boards are actively pursuing or initiating additional focused actions to address this heightened concern. Focused actions are targeted toward: ensuring that adopted TMDLs are efficiently implemented and that new TMDLs are adopted in a timely manner; developing and implementing regional and statewide policies and plans to ensure effective and consistent protection of beneficial uses, evaluating the potential impacts of pyrethroid pesticide and ammonia concentrations in Delta waters on organisms, increasing coordination of monitoring and assessment efforts, increasing oversight of regulated dischargers, decreasing response time to toxic incidences, and working with researchers to address water quality problems associated with blue-green algae blooms in the Delta. This section is focused on these issues. In addition, the Delta Contaminants Monitoring Program is discussed in the following section. The following issues are specifically discussed in this section:

1) TMDLs
2) Drinking Water Policy for the Central Valley
3) Once-through Cooling Power Plants
4) SQOs for Enclosed Bays and Estuaries
5) Invasive Species
6) BGA
7) Characterize Discharges from Delta Islands

8) Effects of Ambient Ammonia Concentrations on Delta Smelt Survival and Algal Primary Production
9) Selenium Screening Study for the Delta
10) Coordination with the Department of Pesticide Regulation and Delta County Agricultural Commissioners on In-Delta Pesticide Use

Total Maximum Daily Loads

Goals: Reduce contaminants in Delta waterways to levels that do not impair beneficial uses.

Objectives: Develop and implement TMDLs for constituents that impair aquatic life, wildlife, and agriculture beneficial uses in the Delta including salt and boron, low DO, OP pesticides, pathogens, mercury, selenium, and PCBs.

Impetus: Delta waterways are listed as impaired due to several contaminants. TMDLs are designed to assign loads to sources of contaminants to reduce loads to levels that protect beneficial uses.

Background: Below is a summary of the TMDLs for Delta waterways. More detailed information can be obtained at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/index.shtml and http://www.waterboards.ca.gov/sanfranciscobay/tmdlmain.shtml

- San Joaquin River Salinity and Boron: The San Joaquin Valley has historically been recognized as a leading region of agricultural production in the State and the nation. Over 100 years of water development have been linked to significant degradation of water quality. Concerns regarding inadequate drainage and salt accumulation arose around the turn of the century and date as far back as the 1880s and 1890s. This TMDL was adopted by the Central Valley Regional Water Board in September 2004 and approved by the State Water Board in February 2007. It addresses a problem that has defied solution for more than 100 years. The TMDL addresses the reach of the San Joaquin River between the Stanislaus River confluence and Vernalis (approximately two miles). The goal of the TMDL is to achieve compliance with the existing salinity objective at Vernalis. Staff determined that meeting the salinity objective would also achieve compliance with the boron objective. The Basin Plan amendment establishes salt loading allocations for 7 subareas in the San Joaquin Basin, limits on salt loads that are delivered to the valley in the Delta Mendota Canal, a time schedule for incorporating these load limits into WDRs or waivers of WDRs and a time schedule for adopting salinity objectives for reaches of the San Joaquin River upstream of Vernalis. In addition, point source dischargers are required to meet the Vernalis salinity objectives in their effluents. The amendment encourages development of implementation strategies that take into account real time monitoring and timing of discharges. The TMDL assigns

responsibility to USBR for salt loads delivered to the San Joaquin Valley from the Delta. This activity will be coordinated with the Salinity Management Plan for the Central Valley (CV-SALTS) activity described in the Other Activities Element.

- San Joaquin River Salinity and Boron Upstream of Vernalis: In Water Right Decision 1641, the State Water Board directed the Central Valley Regional Water Board to adopt water quality objectives for salinity in the lower San Joaquin River upstream of Vernalis. The Central Valley Regional Water Board is currently developing a TMDL for the San Joaquin River upstream of Vernalis that will expand upon work previously completed in the Vernalis TMDL. The upstream TMDL will adjust the implementation framework presently in the Basin Plan to implement the upstream TMDL. The first phase of this TMDL will address the stretch of the San Joaquin River from the Stanislaus River to the Merced River.

- Low DO in the Stockton Deep Water Ship Channel: The San Joaquin River experiences regular periods of low DO concentrations in the first few miles of the Stockton Deep Water Ship Channel downstream from the City of Stockton. There are three main factors contributing to low DO levels: loads of oxygen-demanding substances entering the channel from upstream; the geometry of the channel (that has been deepened significantly over natural conditions to accommodate shipping); and reduced flow resulting from water management in the San Joaquin River basin. The low DO poses a threat to migrating salmon trying to enter and leave the San Joaquin River and to resident species. The Central Valley Regional Water Board adopted the Basin Plan amendment and DO Control Program to implement the DO TMDL in January 2005 and it was approved by the State Water Board in November 2005 and the U.S. Environmental Protection Agency (USEPA) in March 2007.

- Diazinon and Chlorpyrifos in Delta Waterways: The Delta Basin Plan Amendment for the control of diazinon and chlorpyrifos addresses discharges into 146 different Delta waterways. The Amendment includes numeric water quality objectives for diazinon and chlorpyrifos and establishes the loading capacity based on the additive effects of the two chemicals. The Central Valley Regional Water Board adopted the Basin Plan amendment in June 2006 and it was approved by USEPA in October 2007. Management plans are required of all direct and indirect discharges of diazinon and chlorpyrifos. The management plans must describe the actions the dischargers will take to meet their load allocations and the water quality objectives. Since diazinon and chlorpyrifos sources are primarily agricultural, it is expected that the agricultural water quality coalitions will take the lead in addressing any exceedances. The coalitions will be required to submit management plans on behalf of their coalition members. The Irrigated Lands Regulatory Program (ILRP) will have the lead in requesting and reviewing management plans.

- Pathogens: Pathogen counts in a number of Delta waterways exceed applicable numerical criteria. The Central Valley Regional Water Board adopted a TMDL in March of 2008. The TMDL will be implemented by including stormwater monitoring and best management practices (BMPs) in NPDES permits for discharges in the affected waterways.

- Mercury: Mercury concentrations in Delta and San Francisco Bay fish tissues exceed human health criteria. A TMDL for mercury in San Francisco Bay has been adopted and is currently being implemented. The San Francisco Bay Mercury TMDL contains waste load allocations for urban runoff that represent about a 50% reduction from current loads. It is anticipated that the Delta Mercury TMDL will be considered by the Central Valley Regional Water Board by early 2009. The staff draft TMDL includes mercury fish tissue objectives for the Delta and includes methylmercury and total mercury load allocations for the principle sources entering the Delta, including discharges from wetlands, NPDES facilities, urban areas, and discharges associated with dredging and flood control and water management. The staff draft Basin Plan amendment requires responsible parties to conduct studies to evaluate how compliance with load allocations can be achieved. The amendment would require the Central Valley Regional Water Board to re-evaluate the load allocations and implementation strategies before the date of compliance with load allocations. Anticipating that not all dischargers will be able to meet the proposed allocations, staff is working with the Sacramento Regional County Sanitation District and other stakeholders to develop an offset program. Staff and stakeholders are still discussing potential revisions to the staff draft TMDL.

- North San Francisco Bay Selenium: Bioaccumulation of selenium in diving ducks has led to health advisories for local hunters. Monitoring of selenium in ducks, fish, and invertebrates in the northern part of the Bay and Delta has revealed levels that could cause health risks to people and wildlife. Selenium concentrations in North Bay do not exceed the California Toxic Rule (CTR) saltwater criterion (5 µg/L) for protection of aquatic life. However, the CTR objectives are not designed to protect wildlife from dietary exposure to selenium and thus do not protect human consumers of Bay waterfowl. The 1987 California Office of Environmental Health Hazard Assessment (OEHHA) human health advisories against the consumption of diving ducks lead to the listing of segments of the Bay in 1998 as impaired pursuant to Water Code section 303(d). A new TMDL project is underway to address selenium toxicity in North San Francisco Bay. The North Bay selenium TMDL will identify and characterize selenium sources to the North Bay, and the processes that control the uptake of selenium by wildlife. The TMDL will quantify selenium loads; develop and assign waste load and load allocations among sources; and include an implementation plan designed to achieve the TMDL and protect beneficial uses.

- San Francisco Bay PCBs: OEHHA issued a sport fish consumption advisory in response to concerns about high levels of PCBs in fish from San Francisco Bay and the westernmost Delta. The San Francisco Bay PCB TMDL was approved by the Regional Water Board in February 2008 and is currently awaiting State Water Board review. The PCB TMDL requires urban runoff sources to be reduced by more than 90% from current loads over the course of 20 years.

- Old and Middle River Dissolved Oxygen: Low oxygen levels periodically develop during summer in Old and Middle rivers when rock barriers are installed in the south Delta to benefit agricultural diversions. The low oxygen levels can adversely impact aquatic organisms and violate the Water Quality Control Plan for the Sacramento and San Joaquin River Basins. Limited information exists on the causes of the problem or the responsible parties. The Water Boards will continue to assess DO and other relevant data to evaluate low DO conditions in Old and Middle rivers, and prioritize development of a TMDL.

Scope: The Bay-Delta Team will coordinate with TMDL program staff on TMDLs that affect the Bay-Delta.

Activities, Products, and Timelines: TMDL program staff develops annual workplans that need not be repeated here.

Resources: Central Valley Regional Water Board TMDL program staff and management set priorities for TMDL development and implementation through the annual workplan. There are not enough existing resources to aggressively implement all of the adopted TMDLs while at the same time developing new TMDLs to address other impairments in the Bay-Delta. Currently, the Central Valley Regional Water Board TMDL program is allocated 15 PY and $300K in contract funds per year (based on fiscal year 08-09 allocation). However an additional $300K in contract funds is needed per year for all of the TMDL work and 2.5 PY per year is needed to implement the OP pesticide and Delta mercury TMDLs and to evaluate the need for a low DO TMDL for Old and Middle rivers. Regarding implementation of the San Francisco Bay Regional Board's TMDLs for PCBs and Mercury in San Francisco Bay, some of the implementation of these TMDLs will be covered under existing staff resources for the NPDES and stormwater programs. However, full oversight and involvement in the development and review of actions, special studies, and risk management activities will require at least one additional PY per year. Regarding the North Bay selenium TMDL, San Francisco Bay Regional Water Board staff has committed 1 PY per year for this activity. The Western States Petroleum Association has committed about $1 million for technical studies and an advisory committee.

Drinking Water Policy for the Central Valley

Goal: The goal of this project is to improve policies for protecting municipal and domestic supply beneficial uses in the Central Valley.

Objective: The objective of this project is to amend the Basin Plan to address regulatory gaps for drinking water constituents of concern.

Impetus: The Basin Plan does not include water quality objectives for some constituents that threaten drinking water beneficial uses, specifically pathogens, organic carbon, and bromide.

Background: Surface waters of the Bay-Delta and upstream watersheds provide a portion of the drinking water supply for more than 65 percent of California's population. Impairment of these waters poses treatment challenges and public health concerns for people who drink the water. The Water Boards' Water Quality Control Plans include objectives for many constituents that threaten drinking water sources. However, some constituents are not addressed, specifically pathogens, organic carbon, bromide, and nutrients. The Central Valley Regional Water Board is currently developing a drinking water policy to address these issues.

Scope: The Central Valley Drinking Water Policy will address high priority constituents of concern for drinking water supplies in the Delta and its tributaries downstream of major dams.

Activities, Products, and Timelines:

- **August 2008:** Hold CEQA scoping meetings.
- **August 2009:** Complete technical studies.
- **May - October 2009:** Develop Central Valley Drinking Water Policy staff report.
- **November 2009 - January 2010:** Conduct peer review and respond to peer review comments.
- **February 2010 - April 2010:** Conduct public review.
- **June 2010:** Central Valley Regional Board to consider adoption of policy.

The work plan for the policy development can be found at:
http://www.waterboards.ca.gov/centralvalley/water_issues/drinking_water_policy/

Resources: The California Urban Water Agencies and the Sacramento Regional County Sanitation District fund Central Valley Regional Water Board staff to work on the policy development and technical work to support the policy is funded through a State Water Board Proposition 50 grant. Currently the Central Valley Regional Water Board receives 0.5 PY per year for working on the policy and no additional resources are needed for this activity.

Once-Through Cooling

Goal: The goal of this project is to protect pelagic organisms and other fish and wildlife beneficial uses from the adverse effects of power plants using once-through cooling operations in the Bay-Delta and other areas of the State. While regulating once-through cooling, the State Water Board will work to ensure that the electrical power needs essential for the welfare of the citizens of the State are met.

Objectives: The objectives of this project are to: adopt a statewide policy that implements Clean Water Act section 316(b) to control the harmful effects of once-through cooling water intake structures in the Delta and throughout the State on marine and estuarine life; and to adopt revised NPDES permit requirements for the two Delta power plants (Contra Costa and Pittsburg) that protect beneficial uses.

Impetus: Once-through cooled electrical generating plants in the Delta and other parts of California impinge and entrain significant numbers of fish and aquatic organisms, included pelagic organisms and other threatened and endangered species. These plants also have other impacts related to thermal discharges. The March 2007 Pelagic Fish Action Plan specifically identified the assessment and reduction of entrainment at the Contra Costa and Pittsburg Power Plants in the Delta as a measure to reduce impacts to pelagic organisms in the Delta. The Pittsburg and Contra Costa plants have reduced operation over time. Nevertheless, there are still potentially significant intake and discharge impacts, and up-to date requirements based on a comprehensive statewide policy and other pertinent information should be established to assure the protection of pelagic organisms and other fish and wildlife beneficial uses.

Background: There is concern that the once-through cooled electrical generating plants in the Delta operated by Mirant Delta are causing impacts to Delta species including Delta smelt, threadfin shad, and juvenile striped bass and salmon due to impingement or entrainment. There also are concerns that the discharge of heated effluents from these facilities may be causing adverse impacts. In the past, these facilities were operated frequently. Over time, however, the Delta power plants have reduced their operations and currently only operate at the direction of the California Independent System Operator when additional power is needed to avoid power outages, primarily during the summer months. Recently, the capacity utilization rates for these plants have been between 5 and 10 percent. Mirant Delta is currently working with DFG and the National Marine Fisheries Service to obtain an updated incidental take permit pursuant to the California Endangered Species Act. That process will require additional monitoring and evaluation of take species and identification of avoidance and mitigation measures necessary to address the level of take. Study results should become available in the fall of 2008. In addition, Mirant

Delta is also participating in the BDCP in an effort to address the impacts of operations of the facilities.

Operations of the Delta power plants are subject to the Central Valley Regional Board's (for Contra Costa) and the San Francisco Bay Regional Board's (for Pittsburg) NPDES permitting authorities. Mirant Delta applied for re-issuance of their existing permit for the Pittsburg Plant in December 2006 and this application is still being considered. The existing permit expired in June 2007 but has been administratively extended until a new permit is issued. The Central Valley Water Board adopted an NPDES permit for the facility in Contra Costa in 2001 and is initiating the process to update the permit. .

Since 1972, the Clean Water Act has required in section 316(b) that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. However, efforts by USEPA to adopt regulations implementing Clean Water Act section 316(b) for existing power plants have been largely unsuccessful. The State Water Board is therefore considering the development of a State policy to establish requirements for implementing Clean Water Act section 316(b) for existing coastal and estuarine power plants. However, this policy is not being prepared to address thermal effects.

In 1975 the State Water Board adopted the California Thermal Plan, which sets standards for thermal discharges (Clean Water Act section 316a), including those from power plants. However, the Thermal Plan does not address power plant intakes. To date, the State Water Board has not adopted any State policies to implement Clean Water Act section 316(b) or Water Code section 13142.5 regarding the State's policies for water quality in coastal and marine environments. In 1975 the State Water Board did adopt a policy on the use of fresh inland surface waters for power plant cooling. The policy in State Water Board Resolution No. 75-58, titled "Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling," was intended to discourage the use of inland water resources for once-through cooling. The 1975 policy favors the use of treated wastewater or seawater as cooling water in order to conserve fresh inland water resources. The 1975 policy does not address Clean Water Act section 316(b) and is significantly out-of-date.

Scope: The scope of this project involves: 1) developing a statewide policy to implement Clean Water Act section 316(b) that controls the harmful effects of once-through cooling water intake structures on marine and estuarine life (excluding thermal effects); and 2) adopting revised NPDES permits for the two Delta power plants that protect beneficial uses. The permit renewals will be coordinated with other ongoing efforts, including work that that has been initiated with DFG and NOAA Fisheries to evaluate the impacts of current intake operations. A secondary focus will be to consider whether there are any short-

term actions that may be implemented while the NPDES permit renewals is under development.

Activities, Products, and Timeline:

- **March 2008:** CEQA scoping document for the statewide policy with preliminary draft policy was released on March 20, 2008.
  Status: The scoping document is posted at http://www.waterboards.ca.gov/water_issues/programs/npdes/cwa316.shtml
- **April – June 2008:** An Expert Review Panel was convened initially in January 2008 and is currently reviewing the scoping document and preliminary draft policy.
  Status: The Expert Review Panel has provided draft findings that will be presented at the May 2008 scoping meetings.
- **May 2008:** Hold CEQA public scoping meetings on the statewide policy.
  Status: Meetings were held on May 8 and 13, 2008. Comments were due May 20, 2008.
- **December 2008:** Circulate draft staff report and statewide policy for public review and comment. Submit the draft staff report and statewide policy to external scientific peer reviewers for their comment.
- **February 2009:** Hold public workshops to receive comments on the draft staff report and statewide policy.
- **April 2009:** Prepare and circulate responses to public comments (and if necessary peer review comments) document and a draft final staff report and statewide policy.
- **June 2009**: Propose for adoption the draft Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling by the State Water Board.
- **Subject to Regional Water Board Timelines:** The Central Valley and San Francisco Regional Water Boards will complete reissuance of NPDES permits for the Contra Costa and Pittsburg Power Plants respectively. In that effort, the Regional Boards will undertake the following activities:
  - Review all impingement and entrainment studies and thermal studies relevant to reissuance of the NPDES permits.
  - Incorporate current information on the State's Thermal Plan and the State's Once-Through-Cooling Policy into the permit requirements
  - Coordination between the Central Valley Regional Board and the San Francisco Bay Water Board to promote consistent permit requirements.
  - Complete the Tentative Order and issue public notice of a 30-day public comment period.
  - Review comments, revise, and submit revised Tentative Order to the Boards for adoption.
- **Ongoing:** Evaluate the need for additional actions to prevent impacts to fish and wildlife beneficial uses.

Resources: Additional contract resources will be needed to fund the Substitute Environmental Document. Federal Clean Water Act section 106 funds may be used to complete this effort according to the above schedule. 1.5 PYs are dedicated to preparing the policy and no additional PYs would be required for this activity and likely would not be needed to revise and renew the NPDES permits. Additional resources may be needed in the event additional actions are needed.

Sediment Quality Objectives for Enclosed Bays and Estuaries

Goal: The goal of this project is to develop and adopt SQOs for the Delta and other estuaries and enclosed bays of California that include scientifically robust indicators to protect: sediment dwelling organisms from direct exposure to toxic pollutants in sediments; and human health from contaminants in fish tissue that bioaccumulate from the sediment into the food web.

Objective: The objective of this project is to develop a complete suite of tools and framework to enable end-users to effectively and transparently assess sediment quality relative to the receptors of interest described above and develop an implementation policy that is logical, feasible, protective, and encourages controls on pollutants before they reach surface waters.

Impetus: The California Water Code requires the State Water Board to develop sediment quality objectives. A court mandate and an agreement with litigants further require the adoption and submittal of Phase II SQOs by December 31, 2010.

Background: In 1989, the Porter-Cologne Water Quality Control Act (Porter-Cologne) was amended to require the State Water Board to develop SQOs as part of a comprehensive program to protect existing and future beneficial uses within California's enclosed bays and estuaries (Wat. Code, § 13393). In 1991, the State Water Board prepared a seven year conceptual approach to developing SQOs in a Workplan for the Development of Sediment Quality Objectives for Enclosed Bays and Estuaries of California. The 1991 Workplan included a schedule and specific tasks to develop direct effects tools that would protect benthic communities and an element to assess the human and ecological risk in bays and estuaries from pollutants in sediments.

A number of factors resulted in the significant delay of this program, and, in 1999, a lawsuit was filed against the State Water Board for failing, among other things, to adopt SQOs in accordance with Porter-Cologne. In 1999, the California Superior Court ruled against the State Water Board and ordered that the State Water Board develop SQOs.

Few states have attempted to develop SQOs because of the lack of ecologically relevant tools, difficulties interpreting and integrating the results, and an inability to establish causality. In 2003, the State Water Board initiated a multi-phase

effort to develop SQOs. The State Water Board supported the Phase I of this program, targeting direct effects in enclosed bays. The budget for Phase I and the initiation of Phase II (human health indirect effects and estuarine direct effects) was $5 million.

In February 2008 the State Water Board adopted Phase I SQOs in the Water Quality Control Plan for Enclosed Bays and Estuaries Part 1 Sediment Quality. Staff is addressing certain procedural issues in order to obtain Office of Administrative Law approval, and then the Phase 1 SQOs must receive USEPA approval prior to becoming effective. While this was a landmark event, the first statewide plan for SQOs in the nation, Phase I was severely time-limited due to the court mandated compliance schedule. Because time was a critical factor, this program focused primarily on the improvement of existing tools and methodologies that had been applied with success in certain enclosed bays in California. Only a general approach was adopted for estuarine sediment quality, without specific tools and thresholds. Although there is a large volume of sediment quality data available from enclosed bays of California, there have been very few studies and corresponding data suitable for developing SQO tools for tidal freshwater habitats such as the Delta. The data limitations are most severe for the Delta, which is expected to represent a distinct habitat group from other tidal freshwater areas in the State.

Scope: The scope of this activity involves developing and adopting revisions to the SQOs in the Enclosed Bays and Estuaries Plan by the end of 2010 to include interpretive tools, indicators, and a framework to assess the risk to: sediment dwelling organisms from direct exposure to toxic pollutants in sediments; and human health from contaminants in fish tissue that bioaccumulate from the sediment into the food web.

Activities, Products, and Timeline:

- **September 2007 – May 2008:** Collect sediment grab samples throughout the southern and central Delta to support the development of indicators and corresponding exposure and response categories that could be utilized in a multiple line of evidence approach.
  Status: DWR collected grab samples in October 2007 and the samples are currently undergoing analysis. Additional samples will be collected in Spring 2008.
- **March 2008 – December 2010:** Initiate Phase II of the SQO Scientific Steering Committee to provide independent review of all proposed technical tasks and assessment of the results conclusions and recommendations.
  Status: This committee will meet no less than annually. The next meeting is scheduled for June/July 2008.
- **December 2010:** Adopt and submit Phase II SQOs to the Office of Administrative Law.

Resources: This activity requires approximately 1 PY per year for the term of the project and is being met with existing resources. Additional contract funding will be needed to complete these tasks successfully. Anticipated needs are $500,000 to complete Phase II for both direct (estuarine) effects and human health indirect effects. An additional $5 million would also be necessary to complete Phase III SQO efforts targeting fish and wildlife.

Invasive Species

Goal: The goal of this project is to prevent the introduction and spread of invasive species in the Bay-Delta and other areas of the State.

Objectives: The objectives of this project are to: 1) coordinate with and support the activities of other agencies with direct regulatory control of invasive species introduction and 2) continue or modify ongoing Water Board regulatory activities to minimize the introduction or spread of invasive species in the Bay-Delta and other areas of the State.

Impetus: The Bay-Delta ecosystem has been significantly impacted by invasive species. Invasive species are thought to be a factor contributing to the pelagic organism decline.

Background: The entire Bay-Delta is listed as impaired by exotic species pursuant to Clean Water Act section 303(d). Studies have documented significant numbers (at least 250) of non-native species that have invaded San Francisco Bay and the Delta. Some of these species have caused major impacts on ecosystems in the Bay and Delta, primarily by displacing native species and disrupting food chain dynamics. Impacts vary by species and location. Some impacts are short term, while others can be long term or permanent.

Sources of these invasive species vary. Many are introduced through the discharge of ship ballast water imported from other parts of the world. Some have been deliberately introduced, for what at the time seemed like good reasons. Recreational boats, live bait, live imported seafood, aquarium/aquascaping releases, and water delivery and diversion introduce others. Once introduced, the species continue to spread to any areas where natural conditions allow their survival. Often, because of a lack of natural predators, parasites, pathogens, and other inhibitors to excessive population growth, populations of invasive species explode when entering a new area, compounding ecosystem disruptions. If inhibitors to excessive population growth are established, the impacts can diminish, but this may take from months to decades.

State law has given the primary authority to regulate ballast water, to control the introduction of new invasive species, to the State Lands Commission, which is developing a regulatory program. Other State agencies with a significant role include DFG, the Department of Boating and Waterways, the Department of

Food and Agriculture, and DWR. A California Agencies Aquatic Invasive Species Team has recently been formed to provide coordination of invasive species management. At the federal level USEPA is under a court order to develop an NPDES permit for ballast water discharges by September of 2008. USEPA has indicated that a draft national general permit will be issued by May of 2008.

Scope: The scope of this activity extends throughout the Bay-Delta and the State. Due to the fact that other agencies have primary regulatory control over invasive species, the role of the Water Boards will be limited to advising and supporting these agencies in development of regulatory programs and, as appropriate, implementing regulatory controls.

Activities, Products, and Timeline:

- **Ongoing**: The Water Boards will address the issue of invasive species though two approaches. First, staff will continue to coordinate with other State regulatory agencies, including participation on the California Agencies Aquatic Invasive Species Team. Staff will also review and comment on any draft NPDES permit for ship ballast water discharges proposed by USEPA. The second approach is to include invasive species concerns in the Water Boards' ongoing regulatory and grant programs. For example, Clean Water Act section 401 Water Quality Certifications that include the creation of mitigation habitats need to include provisions for monitoring and controlling invasive species in those habitats. Similarly, grants overseen by Water Board staff that include habitat creation or restoration need to include invasive species control.

Resources: This activity requires an estimated 1 PY per year for all three Boards and is met with existing resources.

Blue-Green Algae

Goal: The goal of this project is to: identify human health, biological, and ecological risks associated with BGA blooms statewide, including the Delta; and to take any appropriate actions to control for BGA blooms in the Delta and other areas of the State.

Objective: The objective of this project is for the State Water Board, working with the Department of Public Health (DPH) and in collaboration with the Regional Water Boards and local health departments, to develop a standardized statewide monitoring program to better understand BGA blooms. The resulting monitoring program will be used to determine the need for, and development of, appropriate regulatory controls to protect beneficial uses throughout the State, including the Bay-Delta. This work has, and will continue to be, coordinated with efforts by other state and federal agencies such as OEHHA, DWR, DFG, and USEPA.

Impetus: Toxicity associated with BGA blooms has been identified as a potential serious water quality concern in the Delta and other areas of the State.

Background: BGA (also known as cyanobacteria) are common and naturally occurring in many aquatic systems around the world and generally occur in areas with elevated temperatures and nutrients and decreased water flow. Certain species of BGA have the ability to produce toxins (cyanotoxins) that have an adverse effect on human health and the ecosystem. Recent water quality data and tissue data have indicated the emergence of previously unknown phycotoxins, called microcystins. These BGA and/or their toxins were initially thought to be confined to fresh water, but are also now being identified in the Delta, other estuarine waters, and coastal waters in California. Very little is known about the frequency, spatial extent, or associated environmental conditions of these BGA blooms, particularly in California's major watersheds. Similarly, little is known about the stability of microcystins in estuarine and marine systems, or the likely transport pathways from algae to the food web. More rigorous tests of potential marine and freshwater sources are needed. State Water Board Resolution 2006-0016 authorized funding from the State Water Pollution Cleanup and Abatement Account for an assessment of the nature and extent of BGA water quality problems occurring in California.

Scope: The scope of this activity involves addressing BGA blooms in the Delta and throughout the State. The State Water Board currently has a contract with OEHHA, and work is underway to: investigate the human, animal, and ecological health effects that may be associated with exposure to BGA toxins; identify and develop scientifically based health protective "action levels" that may be applied as needed by local, regional, State or tribal entities throughout California to reduce or eliminate BGA toxin exposures; and highlight any data gaps or areas of further research that may be useful in addressing BGA toxins. In addition, the State Water Board also has a contract with DPH for laboratory analyses of selected samples, and development of a prototype sampling plan for the collection, handling, and shipment of water, algal, and tissue samples.

Activities, Products, and Timeline:

- **June, 2008 – Fall 2008:** *DPH Contract* – Develop and validate liquid chromatography/mass spectrometry (LC/MS) method(s) for cyanotoxins including, but not limited to, saxitoxin, anatoxin, and cylindrospermopsin.
- **June, 2008 - December 2008:** *DPH Contract* - Develop decision tree and sampling plan for the collection, handling, and shipment of water, algal, and tissue samples.
- **Fall 2008:** *OEHHA Contract* – Final Report on BGA Risk Assessment will be completed.
- **June, 2008 - June, 2010**: *DPH Contract* – Conduct LC/MS analysis for microcystins by collecting a maximum of 100 samples per year from throughout the State.

- **June, 2009:** *DPH Contract* - Perform evaluation of field/test kits for cyanotoxins.
- **December 2009:** *DPH Contract* - Develop a prototype identification guide for common cyanobacteria (e.g. photomicrographs and a list of distinguishing features).
- **June, 2010**: *DPH Contract* - Develop taxonomic identifications using microscopy in order to screen phytoplankton samples for the presence of potentially toxin-producing species.
- **Ongoing**: The State and Regional Water Boards will assess the need to take additional actions to control for BGA blooms in the Delta and other areas of the State.

Resources: Approximately .25 PYs are needed for this activity and are provided with existing resources. Contract work is funded via the Cleanup and Abatement funds approved pursuant to State Water Board Resolution 2006-0016. Additional resources may be needed if actions are taken to control BGA blooms.

Characterize Discharges from Delta Islands

Goal: The goal of this project is to develop and implement a plan for monitoring to characterize water quality and measure flow of discharges from Delta islands.

Objectives: In coordination with the development of the Delta RMP, the ILRP, agencies, and interested stakeholders, determine data needed to characterize the quality and quantity of surface water discharges from the islands into Delta waterways and develop a plan for collecting the data.

Impetus: Discharges from Delta islands are a very large, uncharacterized, potential source of contaminants to Delta waterways.

Background: In 1995 the US Geological Survey estimated total discharges from approximately 680,000 acres of Delta islands at 430,000 acre-feet, representing a large uncharacterized input to the Delta that has potential to impact water quality and hydrology. The drainage discharged from Delta islands consists of precipitation, levee seepage, irrigation runoff and drainage, and surface water withdrawals for other uses. The Water Board's ILRP requires monitoring to characterize agricultural-related drainage in the Delta but does not specifically require monitoring of all the drainage discharged from islands directly into Delta waterways. To comply with the ILRP requirements, the San Joaquin County and Delta Water Quality Coalition monitors agricultural drains on several Delta islands; however, only a couple of the drains they monitor discharge directly to Delta waterways.

In addition, DWR conducted extensive studies on Staten Island and found that there is need to collect water quality and flow data from additional islands to better characterize the variability among them. DWR's Delta Simulation Model utilizes the Delta Island Consumptive Use (DICU) model to estimate contributions

of flow and some water quality constituents from Delta islands. The DICU model uses information on land use, farming practices, and climatic conditions to estimate the amount of water diverted from and returned to Delta waterways from the islands. The model has been shown to be less accurate early and late in the growing season. In addition, the model consistently under-predicts seepage and return flows. Additional data for more islands is needed to improve the Delta island drainage models.

Scope: Flow and water quality monitoring is needed to identify and quantify potential sources of toxicity or other impacts on Delta beneficial uses, including the pelagic organism decline. These data also are needed to improve and calibrate models for characterizing current conditions and for evaluating and planning future Delta conveyance alternatives. There is a need to better understand the quantity, timing, location, and quality of discharges from Delta islands. Potential constituents of concern for assessing impacts to the pelagic organisms in the Delta are ammonia/nutrients, toxicity, pesticides, mercury, and metals. A pyrethroid monitoring study is underway and will provide useful information to help in the development of the comprehensive monitoring plan for Delta island discharges. This activity will be one focus of the Delta regional monitoring program discussed below and stakeholders will need to be involved in the coordination and planning.

Activities, Products, and Timeline:

- **July – December 2008:** Develop the framework and process for working with stakeholders in the development and implementation of this monitoring component.
- **September 2008 – March 2009:** Determine what specific monitoring is needed on Delta island discharges, taking into account all the other monitoring and assessments that are underway.
- **March - April 2009:** Evaluate results from pyrethroid pesticide monitoring study in the Delta (including discharges from the islands) to determine if further study is warranted and to provide insight on study design for additional contaminants.
- **June 2009:** Develop a plan (funding, etc.) for collecting the monitoring information and develop a plan for reviewing and evaluating the results.
- **Ongoing:** Take advantage of available grant funding to support monitoring and assessment work and implementation of control strategies.

Resources: Resources are available to develop the framework for the overall monitoring program for the Delta regional monitoring program as discussed below. The initial work on the Delta island discharges will be coordinated with the work on the Delta regional monitoring program. However, this initial assessment monitoring could be conducted concurrently with the regional monitoring program development but would require an additional 0.5 PY per year and $500K in contract funds per year for approximately two years.

Effects of Ambient Ammonia Concentrations on Delta Smelt Survival and Algal Primary Production

Goal: The goal of this project is to assess the sensitivity of delta smelt and freshwater diatoms to ammonia.

Objective: This project has the following two objectives:
Delta Smelt Survival - First, conduct bioassay experiments in the laboratory with larval delta smelt to determine their sensitivity to ammonia in the lower Sacramento River and identify whether other toxicant(s) might be present.
Algal Primary Production - Second, conduct dilution series and grow-out experiments with algae collected from the lower Sacramento River to determine whether ambient in-stream ammonia concentrations reduce growth rates.

Impetus: Studies suggest that delta smelt may be particularly sensitive to ammonia and that ammonia may limit primary productivity in the Delta. Definitive, controlled laboratory experiments must be conducted to determine the importance of these potential impacts.

Background: Ammonia, specifically the unionized form, is toxic to fish, with salmonid species being most sensitive. In addition, algae growth is inhibited when nitrogen is in the form of ammonia rather than nitrate. Major sources of ammonia loading to the lower Sacramento River include agricultural discharges and waste-water treatment plant discharges. The effects of these discharges on the Delta ecosystem are not well understood and require additional analyses.

Delta Smelt Survival
In most water years, larval delta smelt are caught in the spring about 30 miles below the City of Sacramento at the confluence of the Sacramento River and Sacramento Deepwater Ship Channel. Recent data obtained from bioassays tests with ambient Sacramento River water has led to the hypothesis that larval smelt may be sensitive to ammonia. Bioassay screening experiments are needed to determine the toxicity of ammonia to larval smelt and evaluate the hypothesis that smelt may be impaired by ammonia. Further study will be needed to determine the fate and transport of ammonia in the Delta and the effects on Delta smelt in their nursery area and to determine what, if any, additional actions should be taken to control ammonia discharges to protect delta smelt.

Algal Production
Primary production rates and standing chlorophyll levels in the Sacramento-San Joaquin Delta Estuary are among the lowest of all the major estuaries in the world and continue to decline. The reason(s) are unclear but decreasing primary production is cited as a possible cause of the pelagic organism decline. Recent work by Drs. Dugdale and Wilkerson, San Francisco State University Romberg Tiburon Center, has shown that elevated ammonia concentrations reduce

phytoplankton production rates in San Francisco and Suisun Bays by inhibiting nitrate uptake. A recent review of ammonia concentrations in the Delta has shown that ammonia levels in the Sacramento River at Greene Landing are about an order of magnitude higher than concentrations reducing diatom growth in half in San Francisco Bay. Not known is whether the ammonia concentrations in the River inhibit freshwater diatom production and are a cause of low algal primary production in the Delta. Food web dynamics in the Delta are complex. This study is only one element of a larger research need. Further studies will be needed to determine the relative importance of ammonia on Delta primary production and the overall food web and to determine what, if any, additional actions should be taken to control ammonia discharges.

Central Valley Regional Water Board staff has identified a limited amount of resources to support some screening level studies. Staff has been working with the researchers and interested parties to get these studies started during this season's delta smelt spawning season.

Scope:

Delta Smelt Survival

Seven-day flow-through bioassay experiments are planned with delta smelt this summer at the University of California Davis (UC Davis) Aquatic Toxicity Laboratory. The experiments will use upstream Sacramento River water, ammonium chloride, and effluent from the Sacramento Regional Wastewater Treatment Plant (SRWTP) to bracket ammonia concentrations in the river below the SRWTP. The test endpoint will be smelt mortality. If sufficient larvae are available from the hatchery, the flow-through bioassays will be repeated to increase the robustness of the test results.

Algal Primary Production

The phytoplankton inhibition work at the Romberg Tiburon Center will include field grow-out enclosure experiments and dilution experiments amending increasing concentrations of SRWTP effluent, ammonia, and nitrate into upstream river water and measuring changes in Sacramento River primary production. Both the delta smelt and algal primary production experiments are considered screening studies. The results may be conclusive and indicate no possibility of in-stream impairment whereupon no future work will be required. Alternatively, the results may suggest the possibility of in-stream impacts, at which point further work will be required.

Activities, Products, and Timeline:

- **June – November 2008:** Conduct delta smelt dilution series experiments when larvae are available from the hatchery and prepare final report.
- **May – November 2008:** Conduct phytoplankton inhibition work to coincide with the spring algal bloom and prepare final report.
- **December 2008 – February 2009:** Conduct review of final reports through the Pelagic Organism Decline Contaminants Work Team and hold

stakeholder meetings to present results and recommendations, receive comments, and evaluate what follow-up monitoring or research is needed.
- **As Needed:** Consider additional actions to control ammonia discharges to the Delta.

Resources: The State Water Board executed a $70K contract with UC Davis to conduct all of the ammonia work. The subcontract with the Aquatic Toxicity Testing Laboratory for the delta smelt toxicity testing work is in place and the laboratory is ready to commence work.

A subcontract between UC Davis and the Romberg Tiburon Center is presently being negotiated for the algal primary production work. Staff anticipates that the subcontract will be complete and the Dugdale-Wilkerson laboratory ready to commence work in May or June of 2008.

Adequate resources are available to support these activities during the screening study phase. Approximately 0.2 PY of Central Valley Regional Water Board staff time was diverted from TMDL work to complete these tasks. Additional Central Valley Regional Water Board staff and contract resources may be needed to follow-up on screening study findings.

Selenium Screening Study for the Delta

Goal: The goal of this project is to collect baseline screening information to evaluate the threat that selenium may pose to fishery and wildlife resources and human health in the Delta and aid the San Francisco Regional Water Board in development of a selenium TMDL for the northern part of San Francisco Bay and the western edge of the Delta (west of Antioch).

Objectives: This project has three basic objectives: 1) determine if there are aquatic life impairments in the Delta upstream of Suisun Bay from selenium, 2) collect baseline selenium information to evaluate possible redirected effects of future changes in Delta water management and, 3) identify potential sources of bioavailable selenium to the Delta and northern San Francisco Bay from the Central Valley.

Impetus: The San Francisco Regional Water Board is developing a TMDL for selenium in the San Francisco Bay. Water bodies in the Central Valley are sources of selenium to the Bay. There is need to determine whether the Delta (east of Antioch) also is impaired due to selenium.

Background: Inorganic selenium is converted by microorganisms into selenomethionine and selenocysteine that at high levels can be toxic to consumers of aquatic biota. The primary route for organic selenium exposure is through consumption of aquatic organisms. Loading rates of inorganic selenium are hypothesized to be a major factor controlling production of organic selenium.

Potential sources of inorganic selenium to the Bay-Delta Estuary are the discharge of subsurface agricultural tile drainage from the Panoche Fan in the San Joaquin basin and oil refinery waste from the Carquinez Straits in San Francisco Bay. Successful control programs by both the San Francisco and Central Valley Regional Water Boards have reduced loads from both sources by over fifty percent. Nonetheless, selenium concentrations in ducks in northern San Francisco Bay remain high and the San Francisco Regional Water Board has initiated development of a selenium TMDL control program. Key unresolved issues are whether any selenium beneficial use impairments exist in the Delta and whether selenium loads from the Central Valley contribute to the impairment in the Bay.

Scope: Several thousand fish have been collected in the Central Valley and Delta over the last eight years for other studies. These fish are archived and available for use. Central Valley Regional Water Board staff proposes to analyze about 100 largemouth bass for selenium. Largemouth bass would be used as an indicator species as they are non-migratory and reflect local water quality conditions. Also, a considerable selenium data set has been collected on largemouth bass and other fish species in the San Joaquin Basin and this information will allow for predictions to be made about the concentrations of selenium in other species. Finally, spatial selenium concentration patterns across the estuary will provide an indication whether the net movement of bioavailable selenium is from the San Joaquin and Delta to northern San Francisco Bay or in the opposite direction. This is a screening study and the results may be conclusive and require no follow-up or may suggest the need for detailed future study.

Activities, Products, and Timeline:

- **July – October 2008**: Conduct selenium fish tissue analysis. Products include data summary.
- **November 2008 – March 2009:** Prepare an interpretive report.
- **March 2009 – June 2009:** Meet with stakeholders to evaluate appropriate options for following up on study findings.

Resources: A contract for $30,000 for selenium analysis at the Moss Landing Marine Laboratory has been executed. The Central Valley Regional Water Board will divert 0.1 PY of TMDL staff time to analyze data, write a report, and present the results to stakeholders for review, comment, and discussion of potential follow-up actions.

Coordination with the Department of Pesticide Regulation and Delta County Agricultural Commissioners on In-Delta Pesticide Use

Goal: The goal of this project is to ensure pesticide use does not impair aquatic life beneficial uses in the Delta.

Objectives: The objective of this project is to determine whether and what additional information is needed to evaluate the need for increased measures to control pesticide levels in the Delta.

Impetus: Currently, Delta waters do not meet water quality standards for the OP insecticides diazinon and chlorpyrifos. Researchers are attempting to determine whether these exceedences are contributing to the decline of pelagic organism populations. Such efforts are also underway for pyrethroid insecticides. It is essential that the Water Boards coordinate closely with DPR, which controls the sales and use of pesticides in California, and County Agricultural Commissioners, who along with DPR enforce pesticide use regulations, to ensure that aquatic life beneficial uses are protected from pesticides.

Background: The pelagic organism decline has heightened awareness of potential sources of contaminants to Delta waterways. One area of potential concern is the movement of pesticides from the point of application into the Delta waters at levels that could contribute to the decline of pelagic organisms. This could include pesticide applications associated with agricultural and non-agricultural (e.g. urban) lands. In the Central Valley, irrigated agriculture, including managed wetlands, is regulated by a conditional waiver of WDRs, which requires water quality monitoring to determine compliance with water quality objectives and development of management plans to address exceedances of water quality objectives. The waiver is managed under the Central Valley Regional Water Board's ILRP. Discharges associated with non-agricultural activities can be regulated by the State or Regional Water Boards pursuant to the California Porter-Cologne Clean Water Act or through NPDES permit requirements pursuant to the federal Clean Water Act.

DPR also administers programs aimed at improving water quality that may be affected by pesticides. This includes pesticide applications to agricultural and non-agricultural lands. DPR recently adopted regulations that specifically restrict the agricultural use of dormant spray insecticides (e.g. chlorpyrifos and diazinon) to reduce runoff to downstream waters, including the Delta. These regulations are enforced locally by County Agricultural Commissioners. USEPA has eliminated the non-agricultural use of diazinon. DPR has also placed diazinon, chlorpyrifos, and pyrethroid insecticides into reevaluation. Pesticide registrants must submit additional information on how these pesticides are transported to surface water and identify effective measures to reduce or eliminate runoff. DPR can require additional mitigation measures as a condition for the continued use of the pesticide within the State.

As part of the ILRP, the Central Valley Regional Water Board entered into a memorandum of understanding (MOU) with the State Water Board, DPR, and the Butte and Glenn County Agricultural Commissioners to initiate a pilot project to increase local implementation of ILRP requirements. Under the MOU, the State Water Board funds County Agricultural Commissioners' staff to conduct field work activities to support the ILRP including increased pesticide application inspections, field assessment to document management practice implementation, and inspections in areas with potential for pesticide run-off, among others. This project could be replicated in Delta counties to increase water quality-related activities by the Agricultural Commissioners to decrease runoff of pesticides, improve application of pesticides, and increase rates of compliance with federal label requirements and State regulations.

Scope: This action focuses on pesticide use within the legal Delta and coordination among the Water Boards, DPR, the County Agricultural Commissioners, and the Department of Food and Agriculture, and the Water Quality Coalitions to determine what information is needed to determine whether there is need for increased enforcement activities or restrictions on pesticide use in the Delta. There may also be need to develop an MOU to formalize the coordination.

Activities, Products, and Timeline:

- **July – December 2008:** Hold a series of coordination meetings to determine information needs and develop a plan for gathering the information.
- **January – June 2009:** Gather, compile, and assess information and develop recommendations for future steps including, but not limited to, development of an MOU.

Resources: Currently there are no resources dedicated for the tasks listed above. Redirection of approximately 0.25 PY from other programs would be necessary to complete this action. In addition, if the results of the coordination and evaluation of available information indicates that an MOU with Delta County Agricultural Commissioners is needed, then $70K per county per year in contract funds would be needed to fund one Agriculture Commissioner staff half time and 0.25 PY staff time per year to manage contracts and coordinate the work.

Comprehensive Monitoring Program

Goal: The short-term (1-2 years) goal for this action is to establish a framework for regularly gathering, compiling, assessing, and reporting readily available data currently being collected under Water Board programs and external programs, such as the IEP and DWR's Municipal Water Quality Investigations Program. The long-term (3-5 years) goal is to develop a RMP for the Bay-Delta. Inherent in both the short and long term efforts is the need to develop a framework for coordinating monitoring and assessment efforts in and around the Delta.

Objectives: The objectives of this activity are to use a collaborative stakeholder process in coordination with similar efforts in the Bay-Delta and upstream tributaries, to develop goals and objectives for the short-term assessment and reporting framework and the long-term RMP and establish the management framework, data management, assessment, review, and reporting processes, and funding strategies for each. The short-term assessment will identify parties with monitoring efforts and data currently being collected, which will form the foundation for the RMP.

Impetus: The pelagic organism decline in the Delta and subsequent increased focus on contaminants as a potential cause highlight the need for regularly compiling, assessing, and reporting data that is currently being collected and the need to better coordinate monitoring efforts.

Background: Many agencies and groups monitor water quality, water flows, and ecological conditions in the Bay-Delta, but there is no comprehensive contaminants monitoring and assessment program. IEP, CALFED, and other organizations, including the Water Boards, conduct some of these analyses, but due to their specific mandates, information gaps may exist. Emerging concerns with contaminants related to the decline of pelagic organisms in the Delta, wastewater treatment plant discharges, agricultural discharges, pesticides, BGA toxicity, and unknown toxicity events all highlight the need for well-coordinated contaminants monitoring. A system is needed for coordinating among monitoring programs and integrating contaminants monitoring into existing monitoring efforts whereby all data is synthesized and assessed on a regular basis.

In the late 1990's and again in the early 2000's, agencies and stakeholders attempted to develop an RMP for the Delta dubbed the Coordinated Monitoring, Assessment and Research Program. However, these efforts failed to establish a sustainable and fundable program primarily because the program was too ambitious. The Bay-Delta Team will utilize lessons learned from previous efforts to develop a feasible and fundable RMP using a phased approach as described below.

In addition to learning from past efforts, the Bay-Delta Team intends to coordinate with similar initiatives in the Sacramento and San Joaquin River

watersheds and the Delta. The USEPA, Region 9 funded development of a directory of monitoring programs and a future strategy for monitoring in the San Joaquin River watershed. The strategy will be complete at the end of 2008 and will be a resource for evaluating options for management of the Delta RMP. The Sacramento River Watershed Program and the Central Valley Clean Water Agencies also have partnered to develop a pilot RMP for the lower Sacramento River. The CALFED Science Program plans to fund a proposal to develop a monitoring strategy for the Delta. Finally, there will need to be links to the State Water Board's statewide monitoring council.

Scope: Initially, the geographic scope of the Delta RMP is the legal Delta, including those portions of the Sacramento and San Joaquin Rivers within the legal Delta and the Yolo bypass upstream from the Delta. Although tributaries upstream of the legal Delta are not the initial focus, they may become important elements of the RMP to the extent that Delta water quality issues are affected by or linked to upstream tributaries. Similarly, the Delta RMP will be designed to coordinate monitoring that is being conducted within the legal boundaries of the Delta. Through this effort, the RMP will address monitoring needs and the needs for a toxicity response program in the Delta. It should be noted that there may be need to limit the scope to certain beneficial uses and relevant indicator constituents; however, those decisions will need to be made in discussion with stakeholders.

Activities, Products, and Timeline:

- **April – September 2008:** Compile, assess, and summarize readily available data on contaminants and toxicity in the Delta and upstream watershed boundary locations. Products include a summary report and recommendations for improving contaminants monitoring in the Delta.
- **July – September 2008:** Establish process for stakeholder involvement and coordination. Products include list of relevant stakeholders and a fact sheet describing the process.
- **July – September 2008:** Establish technical expert panel charged with reviewing and providing recommendations on the Delta RMP strategy.
- **July 2008 – January 2009:** Utilizing stakeholder coordination process and a technical expert panel, develop the goals, objectives, scope, and strategy for the Delta RMP. Deliverables include a strategy report and a summary of stakeholder and expert panel input and responses.
- **July 2008 – January 2009**: Compile and synthesize information on existing regional monitoring programs in California and other states including the management structure, function, funding and strengths and weaknesses of each.
- **January – June 2009:** Develop options for the structure and administration of the short-term assessment and reporting framework and the long-term Delta RMP including management entity(ies), peer review and stakeholder input processes, and funding. Deliverables include a

summary of options identifying the advantages and disadvantages of each and needed resources.

- **September – December 2009:** Present options and associated resource needs for the Water Boards' consideration.

Resources: The State Water Board executed a $150K contract with UC Davis to compile the contaminants synthesis report, which will be completed in fall 2008. The Central Valley Regional Water Board initiated a $200K contract with the Aquatic Science Center to conduct the above tasks to gather information, coordinate stakeholder and expert panel review, and develop recommendations for a Delta RMP. The Central Valley Regional Water Board estimates that managing contracts, participating in stakeholder coordination, and providing guidance and input on products will take about 0.5 PY and has dedicated resources from the Surface Water Ambient Monitoring Program to work on this task. Implementing the preferred options for the RMP likely will require redirecting or augmenting existing resources, necessitating input from the Water Boards.

Southern Delta Salinity and San Joaquin River Flow Objectives

Goal: The goal of this activity is to ensure that the water quality objectives included in the Bay-Delta Plan for southern Delta salinity and San Joaquin River flows are protective of the specified beneficial uses and that the objectives are appropriately implemented.

Objective: The objective of this project is to conduct a concurrent basin planning and water rights proceeding to review and potentially modify 1) the southern Delta salinity objectives for agricultural beneficial uses and 2) the San Joaquin River flow objectives for fish and wildlife beneficial uses included in the Bay-Delta Plan, and their implementation through water rights and other measures by 2012. An additional objective of this project is to evaluate compliance with southern Delta salinity and San Joaquin River flow objectives and take enforcement and other actions (including acting on petitions) as appropriate.

Impetus: The southern Delta salinity and San Joaquin River flow objectives and the implementation of those objectives may not be appropriate. Revised objectives and implementation may benefit beneficial uses including: San Joaquin Basin salmonids, pelagic organisms and other species; and may improve San Joaquin River water quality (salinity, DO, and other constituents). In addition, the State Water Board committed to review these issues in the 2006 Bay-Delta Plan. Further, both issues constitute an ongoing compliance problem. Lastly, the State Water Board must address the expiration of the VAMP scheduled for the end of 2011 and other issues associated with the VAMP.

Background:

Southern Delta Salinity

Salinity concerns in the southern Delta have existed since the 1940s as a result of the following factors: upstream depletions; salts imported to the San Joaquin Basin in irrigation water; municipal discharges; subsurface accretions from groundwater; tidal actions; diversions of water by the SWP, CVP, and local water users; channel capacity; and local discharges of land-derived salts, primarily from agricultural drainage. The factors listed above affect salinity in various areas of the southern Delta to different degrees depending on location, flow conditions, and other factors. The southern Delta salinity objectives (measured as electrical conductivity or EC) are intended to protect southern Delta agricultural uses from the adverse effects of salinity. The Bay-Delta Plan includes salinity objectives for the protection of agriculture in the southern Delta at four compliance locations including: the San Joaquin River at Vernalis; the San Joaquin River at Brandt Bridge; Old River near Middle River; and Old River at Tracy Road Bridge (the last three locations are known as the interior southern Delta compliance locations).

The State Water Board established the current southern Delta salinity objectives in the 1978 Sacramento-San Joaquin Delta and Suisun Marsh Water Quality

Control Plan (1978 Delta Plan). The approach used in developing the objectives involved an initial determination of the water quality needs of significant crops grown in the area, the predominant soil type, and irrigation practices in the area. In addition, the extent to which these water quality needs would be satisfied under "without project" (without the SWP and CVP) conditions was also considered. The State Water Board based the southern Delta EC objectives on the calculated maximum salinity of applied water which sustains 100 percent yields of two important salt sensitive crops grown in the southern Delta (beans and alfalfa) in conditions typical of the southern Delta. The State Water Board set an objective of 0.7 milliohms per centimeter (mmhos/cm) EC during the summer irrigation season (April 1 through August 31) based on the salt sensitivity and growing season of beans and an objective of 1.0 mmhos/cm EC during the winter irrigation season (September 1 through March 31) based on the growing season and salt sensitivity of alfalfa during the seedling stage.

In the 1978 Delta Plan, the State Water Board found that the most practical solution for long-term protection of southern Delta agriculture is construction of physical facilities to provide adequate circulation and substitute supplies. For a number of years, the State Water Board deferred implementation of the objectives pending negotiations by DWR, USBR, and the South Delta Water Agency regarding construction of physical facilities. No agreement was reached, however, and ultimately, in State Water Board Decision 1641 (D-1641), the State Water Board authorized a staged implementation of the southern Delta EC objectives. Pursuant to D-1641, USBR is required to meet the Vernalis EC objectives using any measures available to it. DWR and USBR were also required to meet an EC objective of 1.0 mmhos/cm at the interior southern Delta stations on a year round basis until April 1, 2005. As of April 1, 2005, D-1641 requires that DWR and USBR meet an EC objective of 0.7 EC from April through August at the interior southern Delta stations. D-1641 also includes a footnote (5 of Table 2) that states that the 0.7 EC objective is replaced by the 1.0 EC objective from April through August after April 1, 2005, if permanent barriers are constructed or equivalent measures are implemented in the southern Delta. The State Water Board also committed to review the southern Delta salinity objectives in the next review of the Bay-Delta Plan following construction of the barriers.

In February of 2006, the State Water Board adopted Order WR 2006-0006, which in part, adopted a Cease and Desist Order (CDO) against DWR and USBR for the threatened violation of the interior southern Delta salinity objectives. In Order WR 2006-0006, the State Water Board ordered DWR and USBR to obviate the threat of non-compliance with the interior southern Delta salinity objectives by July 1, 2009 and to submit a plan for compliance with those objectives. In the plan DWR and USBR submitted, they propose to construct permanent gates as part of the South Delta Improvements Project (SDIP). However, progress on SDIP has been delayed due to endangered species issues and may be delayed indefinitely. As a result, DWR has requested that the

State Water Board amend the date in the CDO for obviating the threat of noncompliance with the interior southern Delta salinity objectives.

Also in February 2006, the California Court of Appeal, Third District, held that the State Water Board failed to adequately implement the southern Delta salinity objectives in the 1995 Bay-Delta Plan by delaying implementation of objectives at those locations, and thus effectively amending the 1995 Bay-Delta Plan without complying with the procedural requirements for amending a water quality control plan. (*SWRCB Cases* (2006) 136 Cal.App.4th 674.) Consequently, the State Water Board has committed to a process that may result in an amendment to the Bay-Delta Plan.

In December of 2006, the State Water Board adopted the 2006 Bay-Delta Plan. The southern Delta salinity objectives were not substantively changed in the 2006 Bay-Delta Plan due to the fact that adequate scientific information was not available on which to base changes. The State Water Board, however, identified Delta and Central Valley salinity as an emerging issue and cited its pending effort to evaluate the southern Delta salinity objectives and their implementation as part of its larger salinity planning endeavor. Accordingly, in January 2007, the State Water Board held a workshop on the southern Delta salinity objectives and discussed whether and how to study sources and effects of salinity, and methods for its control in the southern Delta. It has held several follow-up meetings related to this issue. The State Water Board has also contracted through DWR to have an agricultural water management consultant review the existing science regarding irrigation salinity needs in the southern Delta and make recommendations regarding whether the science on which the objectives were based is accurate, or if additional studies should be conducted related to this issue. In addition, State Water Board staff are working with DWR modelers to analyze water supplies needed to meet the current objectives with dilution flows.

In 2007, the 0.7 mmhos/cm EC objectives were exceeded at the interior southern Delta compliance locations during the irrigation season. In addition, in March of 2008, the 1.0 mmhos/cm EC objective was exceeded at the Old River at Tracy Road Bridge location. Without significant additional precipitation, additional exceedances of the interior southern Delta salinity objectives are projected to occur this year.

The southern Delta salinity compliance issues are closely connected with the use of Joint Points of Diversion. In D-1641, the State Water Board approved a petition filed by DWR and USBR for use of each other's points of diversion in the southern Delta (known as "JPOD"). The State Water Board approved JPOD in three stages[4] that allow for incremental increases in diversions and require

[4] Stage 1 allows use of JPOD to serve certain USBR customers who receive deliveries from the Cross Valley Canal and to protect fish, provided total exports are not increased. Stage 2 allows use of JPOD for any purpose authorized under the permits, subject to specific limitations to protect fish and other legal users of water. Stage 3 allows use of JPOD for any authorized

corresponding increases in mitigation for potential impacts to other water users and the environment. Authorization for all stages of JPOD is subject to compliance by DWR and USBR with all of the conditions of their water rights, including compliance with the southern Delta salinity objectives, regardless of whether JPOD would adversely affect southern Delta salinity. In 2007, DWR and USBR conducted JPOD while the southern Delta salinity objectives were being exceeded to make up for major export reductions taken to protect delta smelt (Stage 1). Due to the unique circumstances occurring that year, the State Water Board did not take enforcement action. DWR and USBR anticipate the need to again conduct significant JPOD diversions this year while the salinity objectives are potentially being exceeded to make up for export reductions imposed by a federal court to protect delta smelt. The question of enforcement, and what constitutes a violation, will continue to be an ongoing issue.

San Joaquin River Flows

The State Water Board first established the flow objectives for the San Joaquin River at Vernalis in the 1995 Bay-Delta Plan to protect fish and wildlife beneficial uses. The State Water Board set different objectives for three time periods: February through June, excluding April 15 through May 15 (spring flows); April 15 through May 15 (pulse flows); and October (fall flows). The spring flows are intended to provide minimum net downstream freshwater flows in the San Joaquin River to address habitat concerns from reduced flows and water quality degradation. The pulse flows were principally developed to aid in cueing Chinook salmon smolt outmigration from the San Joaquin River. The fall flows were developed to provide attraction flows for adult salmon returning to the watershed to spawn. These objectives were based on the limited scientific information available at the time. In addition, the spring flow and pulse flow objectives include two levels (a higher and a lower) for each time period. The higher flow objective is triggered based in part on hydrological conditions in the Sacramento River watershed that may be very different than those in the San Joaquin River watershed.

In Decision 1641, the State Water Board implemented the spring flow objectives and fall flow objectives by requiring USBR to meet the objectives. In order to obtain additional scientific information on which to base the objectives, in D-1641 the State Water Board also approved conducting the VAMP experiment proposed in the San Joaquin River Agreement (SJRA), in lieu of meeting the pulse flow objectives included in the 1995 Plan, until 2012. Since implementation of the 1995 Plan objectives in the San Joaquin River, salmonid runs in the watershed have declined. Most recently, salmon runs throughout the Central Valley have also experienced a significant decline that may be largely due to ocean conditions. In addition, pelagic organisms in the Delta have experienced an unexpected and precipitous decline. A major issue of concern in this decline is reverse flows on Old and Middle rivers, which are affected by flows from the

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purpose under the permits, up to the physical capacity of the pumping plant, subject to the limitations in stage 2 and further protection of southern Delta water levels.

San Joaquin River watershed and exports of water. Further, USBR has not consistently met the spring flow objectives since D-1641 was adopted. In addition, conditions related to the pelagic organism decline, fish availability for study purposes, hydrology, and other issues have complicated conduct of the VAMP and required major modifications to the study design that compromise the comparability of the study data.

Due to lack of scientific information on which to base any changes, the San Joaquin River flow objectives were unchanged in the 2006 Bay-Delta Plan. The program of implementation, however, was changed to allow for the ongoing staged implementation of the pulse flow objectives through the VAMP until the end of 2011. The State Water Board also identified San Joaquin River flows as an emerging issue requiring additional consideration. In addition to concerns regarding the protection of salmonids, the 2006 Bay-Delta Plan identifies the effect of San Joaquin River flows on pelagic organisms as an issue warranting further consideration. In the 2006 Bay-Delta Plan the State Water Board committed to hold a workshop on this matter to consider a salmon escapement model prepared by DFG to assist in determining flow needs on the San Joaquin River and other pertinent information. In response to concerns regarding the ability of the VAMP to provide needed information on which to base pulse flow objectives for the San Joaquin River and other issues, in the 2006 Bay-Delta Plan the State Water Board requested that the parties to the SJRA conduct a review of the VAMP study design and present the results to the State Water Board at the workshop on the San Joaquin River flows. The VAMP technical group has committed to complete the review of the VAMP and provide the results to the State Water Board.

Scope: This action will focus on salinity and flow issues in the lower San Joaquin River and the southern Delta. The basin planning and water rights processes for these issues will be combined due to their interrelated nature and geographical similarities. However, focused analyses will be used to evaluate each issue. This action will be closely coordinated with all other actions included in this strategic workplan, particularly implementation of the San Joaquin River at Vernalis Salt and Boron TMDL, development of a basin plan amendment and TMDL for salinity upstream of Vernalis, the CV-SALTS effort, and DO TMDLs. In addition, the State Water Board will consider the issues and activities discussed above when evaluating water quality certifications associated with Federal Energy Regulatory Commission hydro-power relicensing projects, including licenses on the Merced and Tuolumne rivers that expire in 2014 (Merced Irrigation District and Pacific Gas and Electric Company) and 2016 (Turlock and Modesto Irrigation District). These activities will also be coordinated as appropriate with outside processes including, upstream San Joaquin River restoration efforts, Delta Vision, BDCP and others.

Activities, Products, and Timeline:

- **Continual**: Evaluate compliance with southern Delta salinity and San Joaquin River flow objectives and take enforcement action as appropriate.
- **April 2008 – Fourth Quarter of 2008:** Conduct an independent expert review of the current science concerning the southern Delta salinity objectives.
  Status: The State Water Board has coordinated with DWR to fund a contract with Dr. Glenn Hoffman, an agricultural water management consultant. Dr. Hoffman is expected to complete his review and issue a report to the State Water Board by December 2008.
- **August 2007 – Fourth Quarter of 2008:** Coordinate with DWR to conduct modeling analyses of the potential water supplies needed to meet southern Delta salinity objectives from various sources.
  Status: DWR has begun initial modeling analyses related to the San Joaquin River at Brandt Bridge and has provided documentation to the State Water Board concerning the findings.
- **September 2008:** Hold a workshop to receive information concerning DFG's San Joaquin River salmon escapement model, the review of the VAMP, and other information.
  Status: DFG has committed to submit the salmon escapement model and the VAMP technical group has committed to submit their report on the VAMP prior to the workshop.
    - If information indicates that immediate changes may be needed to the Bay-Delta Plan or water rights implementing the pulse flow objectives through the VAMP prior to the completion of the VAMP in 2011, immediately initiate a proceeding to make the appropriate changes.
    - If changes are not needed to the Bay-Delta Plan or water rights implementing the pulse flow objective prior to completion of the VAMP, continue to monitor and assess information regarding this issue until the VAMP is completed and conduct the environmental and other review described below to adopt changes to the objectives upon completion of the VAMP.
- **First Quarter 2009:** Issue a Notice of Preparation pursuant to CEQA and hold a scoping meeting regarding potential modifications to the southern Delta salinity objectives and San Joaquin River flow objectives and potential changes to water rights requirements.
- **First Quarter 2009:** Hold water quality control planning workshops to receive information on what, if any, changes should be made to the southern Delta salinity and San Joaquin River flow objectives.
- **First Quarter 2009 – Second Quarter 2009:** Prepare a staff report regarding potential water quality control planning alternatives.
- **Second Quarter 2009 –Second Quarter 2010:** Conduct modeling analyses for the various alternatives and CEQA documentation for potential modifications to the water quality objectives and implementation of those objectives through water rights and any other measures.

- **Third Quarter 2010:** Issue administrative draft EIR for comment by responsible agencies.
    - Make any needed changes to the draft EIR based on responsible agency comments.
- **Fourth Quarter 2010 –Second Quarter 2011:** Issue a draft EIR for public comment.
    - Make any needed changes to the draft EIR based on public comments and prepare responses to comments.
- **Second Quarter 2011 –Fourth Quarter 2011:** Prepare water quality control plan modifications.
- **Second Quarter 2011:** Hold water right hearing to consider potential changes to water right requirements.
- **Second Quarter 2011 – Fourth Quarter 2011:** Prepare draft water right order.
- **Fourth Quarter 2011:** Release draft water quality control plan modifications and draft water right order for public comment.
- **First Quarter 2012:** Discuss draft water quality control plan modifications and draft order at State Water Board meeting.
    - Make any needed changes to water quality control plan and water right order based on public comment and State Water Board direction.
- **Prior to April of 2012:** Consider changes to water quality control plan, water right order, and EIR certification at State Water Board meeting.
- **Unspecified:** Consider DWR's petition to change the CDO as conditions and available resources warrant.

Resources: The State Water Board will require modeling assistance from DWR and USBR. EIR and water right order preparation will require approximately 3 PYs per year. Additional PYs or modifications to the timeline would also be required if any interim changes are needed to accommodate changes to the VAMP. Approximately $2.7 million will be needed over five years to fund development of environmental documents and studies. Approximately $400,000 is already available for this need. Additional contract resources will be redirected as needed. These resources will also be used to assure a coordinated effort with development of Suisun Marsh objectives and the comprehensive review of the Bay-Delta Plan.

Suisun Marsh Management, Preservation, and Restoration

Goal: The goal of this project is to take actions within the Water Boards' purview to appropriately manage, preserve, and restore habitat in Suisun Marsh to protect the public trust, fish and wildlife, and other beneficial uses of water in Suisun Marsh and the Bay-Delta.

Objectives: The objectives of this project are to: support an interagency effort to develop the Suisun Marsh Plan; determine what, if any, changes may be needed to the Bay-Delta Plan Suisun Marsh water quality objectives and their implementation to protect the public trust and fish and wildlife beneficial uses; regulate, manage, and study pollutants in Suisun Marsh; address development around Suisun Marsh to minimize impacts to beneficial uses; and encourage development of a watershed management plan for the entire watershed within Solano County that is tributary to Suisun Marsh.

Impetus: Suisun Marsh is the largest brackish marsh in California and as such, is highly significant to the ecosystem and water quality of the Delta and Suisun Bay. Currently, Suisun Marsh is under significant pressure from a variety of stressors, therefore protection and restoration of beneficial uses is critically important, especially given recent species declines and other issues.

Background: Suisun Marsh is the largest contiguous brackish wetland in the Western US, situated between the fresh water Delta ecosystem and the saline ecosystem of San Francisco Bay. The combination of tidal wetlands, diked seasonal wetlands, sloughs, and upland grasslands provided in Suisun Marsh comprises over 10 percent of the remaining wetlands in California. These wetlands provide many important ecological functions, including wintering and nesting area for waterfowl and water birds of the Pacific Flyway, nursery habitat for native fish, and an essential habitat for other fish, wildlife, and plants, including several threatened, endangered, and sensitive species. Many of these species are dependant upon a careful balancing of fresh and saline waters for their survival. As a result of its location in the Bay-Delta, water quality in Suisun Marsh affects, and is affected by, the SWP and CVP, and other upstream diversions. These factors have made the Suisun Marsh one of the most highly regulated wildlife habitat areas in California and, as such, the Marsh occupies a prominent place in efforts to restore ecological health and improve water management for beneficial uses of the Bay-Delta.

Suisun Marsh is listed pursuant to federal Clean Water Act section 303(d) as impaired by metals, nutrients, low DO, and salinity. The potential sources of impairment include agriculture, urban runoff, and flow regulation and modification. These sources are from activities outside of the Marsh (such as rapid urbanization of the surrounding watershed), within the marsh (such as duck club ponds producing low DO waters), and more distant activities (such as pumping water from the south Delta by the SWP, CVP, and other diverters).

To protect beneficial uses of the Marsh from elevated salinity related in part to reduced Delta outflow conditions, the State Water Board first adopted salinity objectives for the Suisun Marsh in the 1978 Delta Plan and assigned responsibility to DWR and USBR for meeting the objectives in State Water Board Decision 1485 (D-1485). In 1988, construction and operations of physical facilities to control channel water salinity were completed, including the Suisun Marsh Salinity Control Gate. In the 1995 Bay-Delta Plan, the State Water Board amended the salinity objectives included in the 1978 Plan by including numeric salinity objectives at seven locations within the marsh and a narrative objective for the brackish tidal marsh areas. In D-1641, the State Water Board requires DWR and USBR to meet the objectives at five of the seven sites. D-1641 requires that DWR and USBR conduct monitoring at the other two stations (S-35 and S-97) in part due to the fact that DWR and USBR could not meet the objectives through operations of the Salinity Control Gate and disagreement concerning the protectiveness of the objectives at those locations.

Since the 1995 Bay-Delta Plan was issued efforts have been taken to determine what, if any, changes should be made to the Suisun Marsh salinity objectives, specifically whether changes should be made to the objectives at stations S-35 and S-97 or whether to replace the narrative objectives with numeric objectives. In 2001, after the CALFED ROD was issued, the interagency Suisun Marsh Charter Group[5] was formed to develop the Suisun Marsh Plan. The Suisun Marsh Plan is intended to provide a long term plan for tidal marsh restoration and managed marsh enhancements to balance threatened and endangered species recovery with maintenance of existing support functions of the marsh for waterfowl, levee management, and water quality objectives. The Suisun Marsh Charter Group has begun developing a programmatic EIS/EIR for the Suisun Marsh Plan. A public draft is expected in early 2009, with a final EIS/EIR in early 2010. The Suisun Marsh Charter Group has committed to providing a proposed plan for considering potential changes to the water quality objectives following completion of the EIS/EIR. As part of the Suisun Marsh Plan, a Water Code section 401 Water Quality Certification will also be required from the San Francisco Bay Regional Water Board.

In addition to efforts by the Suisun Marsh Charter Group, the BDCP is also looking into restoration activities in Suisun Marsh, and the State Water Board will consider these activities in any review of the objectives.

Scope: This project will focus on activities within the Water Boards' purview to manage, preserve, and restore habitat in Suisun Marsh and to address water quality and water right issues. The scope of this activity is focused on Suisun Marsh. However, to be truly successful at preserving and restoring the Marsh, it will be necessary to manage the immediate tributary areas to the Marsh.

[5]Members include the Suisun Resource Conservation District, National Marine Fisheries Service, US Fish and Wildlife Service, California Department of Water Resources, California Bay-Delta Authority, and California Department of Fish and Game.

Therefore, the development of a watershed management plan for the entire watershed tributary to Suisun Marsh is also encouraged.

This project will be closely coordinated with all other aspects of this workplan and with the Suisun Marsh Planning process, BDCP, Delta Vision, CALFED and other processes as appropriate.

Activities, Products, and Timeline:

- **Through Completion of the Suisun Marsh Planning Process:** Water Boards staff will continue to support the interagency effort to develop a Suisun Marsh Plan, through participating in interagency meetings, reviewing documents, and providing technical support. The Water Boards will also coordinate with the BDCP and Delta Vision related to these issues.
- **Upon Release of the Draft Suisun Marsh Plan EIS/EIR (anticipated for early 2009):** Water Boards staff will review and provide comments on the draft EIS/EIR.
- **Upon Finalization of the Suisun Marsh Plan EIS/EIR (anticipated for early 2010):** Water Boards staff will review the final EIS/EIR. The Suisun Marsh Charter Group will provide a proposed plan for determining what if any changes should be made to the water quality objectives included in the Bay-Delta Plan for Suisun Marsh.
    - The State Water Board will use the plan developed by the Suisun Marsh Charter Group and other information to determine whether and when to undertake a proceeding to consider potential changes to the water quality objectives included in the Bay-Delta Plan and their implementation through water rights or other measures.
- **Ongoing**: The Water Boards will regulate, manage, and study pollutants in Suisun Marsh through a series of ongoing activities including regulating stormwater discharges from nearby cities, and regulating the discharge from a wastewater treatment plant (Fairfield/Suisun Sanitary District) that discharges into Suisun Marsh. San Francisco Bay Regional Water Board staff will continue to administer a Proposition 50 grant (expected to be completed in early 2009) to study the relationship between mercury methylation and low DO levels in Suisun Marsh.
- **Ongoing**: San Francisco Bay Regional Water Board staff will continue to address development around Suisun Marsh to minimize impacts through the 401 Water Quality Certification Program, review of environmental documents, and working with local agencies (specifically the Bay Conservation and Development Commission, which has a major role in preserving Suisun Marsh).
- **As Needed**: The Water Boards will consider taking additional actions as needed to protect beneficial uses of water within Suisun Marsh and the Bay-Delta.

Resources: Activities by the State Water Board to participate in and monitor the Suisun Marsh Planning process will require approximately .25 PYs for the term of this activity. Additional activities to consider changes to the water quality objectives and their implementation will require approximately 1 PY for the term of the activity. The various activities by the San Francisco Bay Regional Water Board staff in Suisun Marsh require about 0.5 PY per year, and this need will continue. In order to develop and implement the proposed watershed management plan, approximately 0.5 PY per year for 5 years of additional San Francisco Bay Regional Water Board resources will be required.

Comprehensive Review of the Bay-Delta Plan, Water Rights and Other Requirements to Protect Fish and Wildlife Beneficial Uses and the Public Trust

Goal: The goals of this project are for the State Water Board to: 1) establish and implement interim and long-term water quality objectives in the Bay-Delta that are protective of fish and wildlife beneficial uses and the public trust; and 2) assure that thorough environmental and technical analyses are conducted to inform any proposed changes to the CVP's and SWP's methods of diversion in the southern Delta.

Objective: The objective of this project is for the State Water Board to assure that analyses are completed of a broad range of alternatives for potential changes to the Bay-Delta Plan and its implementation to protect fish and wildlife beneficial uses and the public trust under the following scenarios: in the interim until any new conveyance facility is completed; in the long-term with new conveyance facilities, and in the long-term in the event that a new conveyance facility is not constructed. The State Water Board will also assure that adequate analyses are conducted to consider any proposed changes to conveyance of water by the CVP and SWP.

Impetus: Changes may be needed to the Bay-Delta Plan water quality objectives and the implementation measures for those objectives to adequately protect beneficial uses and accommodate potential changes to conveyance of water from the Delta.

Background: In December of 2003, the State Water Board began an effort to review the 1995 Bay-Delta Plan to determine what if any changes should be made to that plan. While numerous potential concerns were identified, adequate scientific information was not available on which to base substantive changes to the water quality objectives or the program of implementation for those objectives. As a result, the State Water Board made minimal changes to the 2006 Bay-Delta Plan and identified a number of emerging issues associated with ecosystem health and other concerns to beneficial uses in the Bay-Delta. Two of these issues (San Joaquin River flows and Delta and Central Valley salinity) are addressed in other sections of this strategic workplan.

Since adoption of the 2006 Bay-Delta Plan, concerns related to protection of beneficial uses in the Bay-Delta have escalated, as demonstrated by other processes under way to address these issues, including Delta Vision and BDCP. Flows, water quality, and other water rights issues are at the forefront among the issues that the BDCP and the other processes must address. The Water Boards have the primary regulatory authority over these issues in the Bay-Delta. At a minimum, any proposals pursuant to BDCP to modify conveyance of water through the Delta must be approved by the State Water Board. In addition, a review of water quality objectives and implementation measures needed to

protect fish and wildlife beneficial uses could also be accomplished in coordination with the environmental review for the BDCP effort.

In order to evaluate a reasonable range of alternatives to achieve meaningful recovery of at risk species, the environmental review for the BDCP must consider the flow and water quality needs of the ecosystem on an interim basis and over the long-term, including such issues as Delta outflows, salinity and other issues. While the State Water Board could evaluate these issues independently, it may require many of the same parties to participate in that review by providing expertise, funding, or other resources. Since many of these issues must be addressed in the environmental review for BDCP to evaluate the recovery and restoration of at risk species, the objectives of both the State Water Board and the environmental review needs for BDCP could be achieved through the same environmental review process, provided that the State Water Board can assure that a broad range of alternatives is comprehensively analyzed to consider interim and long-term measures. Such an approach could ensure that the State Water Board's water quality control planning and implementation activities complement and do not interfere with efforts by BDCP.

Scope: The State Water Board will conduct proceedings to receive evidence and make factual determinations concerning Delta ecological matters and also assure that an adequate range of alternatives is analyzed pursuant to CEQA to consider and implement potential changes to the water quality objectives in the Bay-Delta Plan or water rights, or to implement other measures to protect beneficial uses and the public trust. Specifically, the State Water Board will assure that analyses are conducted of changes to the Bay-Delta Plan and its implementation that may be needed in the interim until any new water conveyance facilities are completed, in the long-term if new conveyance is completed, and in the long-term if new conveyance is not completed. The State Water Board will also assure that adequate analyses are conducted to consider any petition to change the SWP's and CVP's water rights to accommodate potential changes to conveyance of water.

The State Water Board could initiate proceedings to produce this information independently or require that this information be provided by water right holders or other parties. The State Water Board will use parallel tracks to develop this information. The State Water Board will conduct a fact-finding proceeding on critical factual issues concerning the Delta's ecology and the impacts of water pollution and diversions on the ecology under its water quality planning authority and with testimony and cross examination under oath. Factual findings by the State Water Board, to the extent possible, will encourage and support the use of sound science in the Bay-Delta Plan review, BDCP, and Delta Vision processes.

In order to efficiently coordinate the State Water Board's efforts with other processes, however, the State Water Board will coordinate some of its analytical efforts, to the extent appropriate, with the BDCP environmental review efforts

since staff anticipates that BDCP can provide some of the needed information and may potentially provide it more quickly since the process is already underway (BDCP is scheduled to complete a draft EIR/EIS by the end of 2009 with a final by the middle of 2010). However, if at any time it appears that the environmental review for BDCP will not achieve the State Water Board's objectives to analyze a broad range of alternatives needed to support modifying the Bay-Delta Plan and its implementation and reviewing potential changes to conveyance of water, the State Water Board will expand its own review of these issues. Any coordination by the State Water Board with the BDCP efforts and the environmental review for BDCP will be on a technical level to assure that the State Water Board's statutory and regulatory requirements are met. The State Water Board and its staff will not advocate for, or endorse any alternatives but will instead work to ensure that a broad range of alternatives is analyzed such that any potential environmental effects are analyzed and disclosed. The State Water Board will in no way be bound by any agreements that may be made by participants in the BDCP and will use its own quasi-legislative and quasi-judicial processes to determine what, if any, changes should be made to water quality objectives or water rights, or to implement other measures.

This activity will be closely coordinated with all of the activities described in the strategic workplan, including consideration of the reasonableness of the SWP's and CVP's methods of diversion in the southern Delta, review of the southern Delta salinity and San Joaquin River flow objectives, development and implementation of TMDLs, and other activities. In addition, this activity will be closely coordinated with Delta Vision, DRMS, CALFED and other Bay-Delta planning efforts.

Activities, Products, and Timeline:

Initial Development

- **August/September 2008:** State Water Board staff will solicit written input from the public as to the critical factual issues concerning the Delta's ecology and the impacts of water pollution and diversions on the Delta's ecology.
- **October 2008:** The State Water Board will hold a scoping meeting on the periodic review of the Bay-Delta Plan.
- **Continuous until Completion of the BDCP Environmental Review Process:** Participate in the BDCP environmental review process to assure that a reasonable range of alternatives is thoroughly analyzed in the BDCP EIS/EIR to consider proposed changes to diversions from the Delta and interim and long-term modifications to the Bay-Delta Plan and its implementation to protect fish and wildlife beneficial uses and the public interest. Monitor the BDCP environmental review process to determine whether that process will produce the scientific and technical information needed to consider interim and long-term changes to the water quality objectives and their implementation.

    - If information indicates that the BDCP environmental review process will not provide the needed information, immediately undertake a proceeding to require development of the needed information, or other appropriate activities.
- **Continuous until Completion of all BDCP Processes:** The Water Boards will provide information on its efforts regarding review and potential modification of the southern Delta salinity and San Joaquin River flow objectives and other activities to assure that appropriate information is provided to the BDCP planning and environmental review processes.
- **Fall 2007 until Completion of BDCP:** State Water Board staff will continue to participate in the BDCP Steering Committee to advise the BDCP process regarding the Water Boards' activities and statutory and regulatory requirements.
- **Winter/Spring 08 until Completion of BDCP:** Water Board staff will continue to participate in the BDCP working groups and technical teams.
- **May 30, 2008:** State Water Board staff provided written comments in response to the March 17, 2008, BDCP NOP outlining issues that should be analyzed in the EIR/EIS.
- **October 2008 until Completion of all BDCP Processes:** Review the need for course corrections as the result of Delta Vision or other such activities.
- **Third Quarter 2009:** Water Board staff will review and comment, as appropriate, on the first draft BDCP.
- **Fourth Quarter 2009:** Water Board staff will review and comment on the BDCP Public Draft EIS/EIR and Public Draft BDCP.
- **First Quarter 2010:** Hold a water quality control planning workshop to consider potential changes to the Bay-Delta Plan.
- **Second Quarter 2010:** Water Board staff will review the Final BDCP EIS/EIR.

Implementation

- **November 2008:** The State Water Board or, where appropriate, an authorized member will conduct an evidentiary hearing on the issues listed below and any other appropriate issues based on input received during Initial Development. These issues shall include, at minimum: sources of salt to the Bay-Delta Estuary, biological impacts of constant or variability salinity on fisheries, biological benefits (if any) of fish screens in the legally defined Delta, biological impacts of ammonia discharges, biological impacts of toxic substances (other than ammonia), and biological impacts of net outflow objectives. The purpose of the hearing will be to receive evidence on these issues and any others identified during Initial Development, and to render findings of fact, including statements that the science is as yet inconclusive, when appropriate.
- **As soon as possible after October 2008:** State Water Board staff will finalize a detailed scope of services for the periodic review of the Bay-Delta Plan and obtain a written commitment from the BDCP Managers for

any portion of the final scope of services they choose to perform. State Water Board staff shall initiate other portions of the periodic review scope through other venues.

- **The State Water Board will review and revise the Bay-Delta Plan when necessary.**
- **The State Water Board will evaluate and consider environmental and other analyses conducted through the BDCP processes.** Where the State Water Board relies on analyses prepared by other agencies, the Board will conduct a public and independent proceeding to consider whether the analyses and the use of the analyses are appropriate for the Board's proceedings.
- **Second Quarter 2010 through Third Quarter 2010:** Hold water right hearings to consider potential changes to water right license/permit requirements and other measures to implement potential changes to the Bay-Delta Plan.
- **Fourth Quarter 2010 through Third Quarter 2011:** Prepare proposed changes to the Bay-Delta Plan and water right decision or order.
- **End of Third Quarter 2011:** Release draft changes to the Bay-Delta Plan and draft water right decision or order for public review.
- **Fourth Quarter 2011:** Make any needed changes to the drafts.
- **End of Fourth Quarter 2011:** Consider adoption of draft changes to the Bay-Delta Plan and draft water right decision or order at State Water Board meeting.
- **Unspecified:** Proceeding to consider any petitions to change related to changes in conveyance of water through the Delta.

*****This timeline may change as the result of changes to the BDCP timeline or other issues. The timeline for consideration of any proposed changes to diversions in the Delta will depend on the details surrounding any such proposal.

Resources: 4 or 5 PYs will be needed until completion of the BDCP EIR/EIS to assure complete and comprehensive review of the BDCP process. Following completion of the BDCP EIR/EIS, 4 PYs will be needed to work on potential changes to the water quality objectives and water right modifications and other implementation measures.

Activities to Ensure that the SWP's and CVP's Methods of Diversion in the Delta are Reasonable, Beneficial and Protect the Public Trust

Goal: The goal of this activity is to ensure that the State's water resources are put to beneficial use to the fullest extent to which they are capable and to assure that diversions from the Delta by DWR and USBR are conducted using a reasonable method of diversion, as required under article X, section 2 of the California Constitution. The method of diversion is comprised of the location, quantity, timing, and infrastructure or facilities (e.g. screening, pumps, forebays) associated with the diversion.

Objective: The objective of this project is to evaluate the reasonableness of the SWP's and CVP's methods of diversion and to develop a remedy to address any unreasonable impacts of the methods of diversion if DWR and USBR fail to develop or implement a comprehensive plan satisfactory to the State Water Board to address concerns in the Bay-Delta associated with their methods of diversion.

Impetus: One of the primary reasons for Delta Vision and the BDCP is to address sustainability and impacts related to the methods of diversion. The State Water Board has the responsibility and authority to ensure that methods of diversion are reasonable. If the BDCP process fails to develop or implement a comprehensive plan to address impacts associated with DWR's and USBR's methods of diversion, the State Water Board can develop and require the implementation of satisfactory interim and long-term measures to address any unreasonable impacts to the State's water supply, fish and wildlife beneficial uses, and other beneficial uses.

Background: Both DWR and USBR hold water rights to export water from the southern Delta for use south of the Delta. DWR holds water rights for diversions of up to 10,250 cfs of water at the Harvey O. Banks Pumping Plant (Banks) and USBR holds water rights for diversions of up to 4,600 cfs at the C.W. "Bill" Jones Pumping Plant (Jones). USBR directly diverts water from channels in the southern Delta on a continual basis, while DWR diverts water from a forebay (Clifton Court) operated to collect water on the high tide. To avoid or reduce entrainment of fish caused by diversions at the Banks and Jones pumping plants, both DWR and USBR operate fish salvage facilities where they collect fish that are diverted into the facilities by a series of louvers immediately in front of the diversion facilities. These fish are collected and later trucked and released into the western Delta.

Questions have arisen as to whether the current quantities, locations, timing, and infrastructure of diversions should be continued or whether actions should be taken to better protect public trust resources, beneficial uses, and the public

interest. Recently, Delta smelt and several other pelagic fisheries in the Delta have experienced precipitous and unexpected population declines. In particular, Delta smelt in recent years have experienced some of the lowest population abundance indices ever recorded, leading to concerns that the species may be on the verge of extinction. Scientists have identified several potential causes for this pelagic organism decline including food availability, temperature, toxics (including ammonia) and other habitat changes and elsewhere in this document these issues are being addressed. Additionally, scientists believe that direct entrainment of fish and larvae by the SWP and the CVP in combination with changes in hydrology in the southern Delta are contributing to adverse impacts on pelagic organisms and other species.

The methods of diversion may also not adequately protect the public interest of the State in ensuring a sustainable and reliable supply of water from the Delta watershed. Concerns regarding the Delta levee system are growing. The Delta includes more than 1,100 miles of levees. Most of the levees were initially constructed in the early 1900's, were never engineered and do not meet modern earthquake and flood control standards. Additionally, as a result of loss of organic peat soil through oxidation, most of the Delta islands sit below sea level (by as much as 25 feet) and if flooded due to sea level rise, earthquakes, or floods, could result in significant sea water intrusion into the Delta and associated impacts on diversions of water from the Delta and other impacts. Water quality using the current method of diversion is already adversely impacted by sea water intrusion, and municipal and agricultural drainage.

As a result of the significant concerns discussed above and others, the State is currently involved in several major planning efforts including: Delta Vision, BDCP, the CALFED ERP, DRMS, and other efforts to address ecosystem, water supply, and levee integrity issues in the Delta. Preliminary information from these planning efforts indicates that a variety of near-term and long-term approaches should be considered to reduce entrainment, enlarge potential recovery areas, improve water supply reliability, decrease catastrophic risks from levee failures, improve water quality for diverters (from reduced salinity), provide more varied water quality for fish, and improve operational flexibility. These approaches may include structural and operational improvements to the water supply conveyance system, habitat restoration, and others. However, while many ongoing processes are attempting to address concerns related to the current methods of diversion in the southern Delta, there is no assurance that any of these processes will result in any interim or long-term solutions to avoid unnecessary harmful effects that may be occurring as a result of the projects' methods of diversion. The State Water Board has continuing regulatory authority over USBR's and DWR's water rights for diversions from the southern Delta and has the responsibility pursuant to article X, section 2, of the California Constitution and Water Code sections 100 and 275 to take action to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water in California. In addition, the State Water Board has the

responsibility to protect the public trust, where feasible, when administering water rights.

Scope: The State Water Board will use information developed through the BDCP process to decide whether to proceed with this activity. It is anticipated that such a plan will be developed by the end of 2010 through the BDCP process, and implemented by DWR, USBR, and other parties thereafter. At this point, it is expected that DWR and USBR will seek modifications to their water rights permits to allow implementation of specific aspects of BDCP. If DWR and USBR fail to develop or implement a plan satisfactory to the State Water Board to address concerns with their methods of diversion, or if new information supports immediate action, the State Water Board may undertake a water right proceeding to evaluate the reasonableness of the SWP's and CVP's methods of diversion and to develop a remedy to address any unreasonable impacts of the methods of diversion.

This activity will be closely coordinated with all other aspects of this strategic workplan, most particularly with the review of the Bay-Delta Plan. This activity will be conducted in coordination with the BDCP process, Delta Vision, DRMS, CALFED, federal and State court requirements, and implementation of applicable biological opinions.

Activities, Products, and Timeline:

- **July 2008 – December 2010:** Attend and comment on the BDCP process. Be actively involved in the BDCP EIR/EIS process as a Responsible Agency to ensure the document is useful to the State Water Board in their decision processes subsequent to BDCP.
- **Quarterly beginning October 2008:** Provide updates to the State Water Board on progress of the BDCP and other related Delta processes. Hold periodic workshops to inform the Board on progress.
- **Fourth Quarter of 2010 (or sooner if the BDCP process ends prematurely) if the BDCP process fails to Develop or Implement a Comprehensive Plan Satisfactory to the State Water Board to Address Concerns with the Methods of Diversion:** Undertake a water right proceeding to evaluate the reasonableness of the SWP's and CVP's methods of diversion and to develop a remedy to address any unreasonable impacts of the methods of diversion. .

Resources: If a water right proceeding is needed, a minimum of 2 PYs would be needed to complete the proceeding. However, depending on the scope and complexity of the proceeding, additional PYs and contract resources might also be needed.

Water Right Compliance, Enforcement, and Other Activities to Ensure Adequate Flows to Meet Water Quality Objectives

Goal: The goal of this Project is to ensure that adequate natural and abandoned flows are available to meet water quality objectives and to ensure that developed water supplies are not adversely affected by unauthorized diversions.

Objective: The objective of this project is to fulfill the State Water Board's statutory responsibility to vigorously enforce water rights by preventing unauthorized diversions of water, violations of the terms of water right permits or licenses, and violations of the prohibition against the waste or unreasonable use of water in the Delta. This project will ensure that natural and abandoned flows are available to meet Bay-Delta flow and water quality objectives.

Impetus: Increasing demands on water from the Bay-Delta and its tributaries, the effects of climate change, and mounting environmental concerns have intensified the need for the State Water Board to vigorously enforce water right requirements to ensure that sufficient flows are available to meet water quality objectives and to prevent DWR's, USBR's, and other water right holders' developed water supplies from being adversely affected by unauthorized diversions. The identification and curtailment of unauthorized diversions will contribute to the protection of beneficial uses in the Bay-Delta watershed, and will ensure the efficient allocation of water resources. These benefits are not limited to the Bay-Delta because vigorous enforcement will serve as a deterrent to other illegal users of water throughout the State and will benefit water supply contractors north and south of the Delta by protecting DWR's and USBR's developed water supplies.

Background: Water Code section 1825 states: "It is the intent of the Legislature that the state should take vigorous action to enforce the terms and conditions of permits, licenses, certifications, and registrations to appropriate water, to enforce state board orders and decisions, and to prevent the unlawful diversion of water." Governor Schwarzenegger's Action Plan for the Environment identifies that strict law enforcement is vital to assure environmental protection and that violators should not achieve unfair competitive advantages over those who comply. The Strategic Plans for both the California Environmental Protection Agency and the State Water Board prioritize improving enforcement programs with consistent, predictable, fair, and equitable actions.

Even if water diverters do possess appropriative water rights, permittees and licensees are not authorized to divert water when it is unavailable, taking into consideration the instream flows needed to satisfy water quality objectives and

senior water rights.[6] Many water right holders in the Central Valley continue to divert under their appropriative water rights when water is not available, taking into consideration the amount of water needed to meet water quality and flow objectives and senior in-basin demands. As a result of diversions under these conditions, the SWP and CVP need to release additional stored water to meet objectives in the Bay-Delta. As a result, a fundamental principle of California water law, that a party cannot benefit from the developed water supply of another without the agreement of the owner of the developed water supply, is not always met.

Sufficient fresh water inflows are needed to provide habitat quality in the Bay-Delta and to prevent seawater from intruding into the Delta and degrading water quality. Reduced Delta outflows and elevated salinity can be harmful to various species of fish and wildlife, agricultural production, and municipal and industrial uses of water throughout the Bay-Delta estuary. Diversions upstream and within the Bay-Delta substantially alter fresh water inflows to the Bay-Delta. As a result, natural and abandoned flows are often inadequate to meet Bay-Delta water quality and flow objectives.

To assure that upstream diversions do not adversely impact fish and wildlife and other beneficial uses of water, the State Water Board establishes flow dependent water quality objectives in the Bay-Delta Plan and implements those objectives through requirements on water right holders. The State Water Board first established water quality objectives for the Delta in the 1978 Delta Plan and implemented that plan in D-1485 by requiring DWR and USBR to meet specified flow dependant water quality objectives. Currently, DWR and USBR are required to meet specified water quality objectives included in the 1995 Bay-Delta Plan pursuant to D-1641.[7] In order to meet these requirements, DWR and USBR curtail their diversions or release additional water from storage when flows entering the Delta would otherwise be insufficient to meet the water quality objectives.

Efforts by DWR and USBR to meet water quality objectives reduce the amount of water DWR and USBR are able to use for project purposes. Illegal diversions when DWR and USBR are bypassing water or releasing water from storage to meet water quality objectives further reduces the amount of water DWR and USBR are able to use for project purposes. In addition, otherwise legal water users who divert water when natural and abandoned flow is insufficient to meet water quality and flow objectives also increase demands on DWR and USBR to meet water quality and flow objectives. In the future, the ability of DWR and

[6] The fact that DWR and USBR are required to meet water quality objectives for the Delta does not give other water right holders who are not expressly responsible for meeting the objectives the right to divert natural and abandoned flows needed to meet the objectives, or the right to divert previously stored water that has been released to meet the objectives.

[7] Other water right holders are required to make certain flow contributions. However, DWR and USBR remain responsible to meet the water quality objectives.

USBR or other responsible water right holders to meet water quality and flow objectives could be affected by the numerous pending and future petitions for assignment of state filed applications seeking to appropriate large amounts of water.

(6) The number and magnitude of illegal diversions in the Bay-Delta watershed is unknown. However, it could be quite significant. In the past certain water diversions to Delta island properties had been characterized as taking place under riparian rights. Recently, however, the State Water Board found in Order WR 2004-0004, that some of these property owners lack a riparian right for their water diversions because their properties were not adjacent to Delta waterways. The San Joaquin County Assessor's records reveal that many parcels within Delta islands are not contiguous to Delta waterways, yet aerial photographs show the parcels are being cultivated and therefore are likely supplied with water diverted from Delta channels. While many of these diversions may posses valid pre-1914 appropriative water rights, the bases of right must be investigated to make that determination.

Scope: In order to address these issues, the State Water Board must investigate why natural and abandoned flows are inadequate to meet water quality and flow objectives. As a first step in this effort, the State Water Board will employ its statutory responsibilities to investigate whether illegal diversions are occurring and take action to address those illegal diversions. This project initially focuses on the Delta. However, other areas of the Bay-Delta watershed are also subject to investigation and potential enforcement action. The State Water Board will use available detailed property mapping and title research information for areas of the Delta, which identifies properties that are not contiguous to Delta waters and consequently may lack riparian status. The State Water Board also has information from DFG regarding existing diversion facilities in the Delta that are not covered by water rights on record with the State Water Board. After the State Water Board provides notice to property owners and gives them an opportunity to identify their existing basis of right, or to cease diversion and use of water, State Water Board staff will gather information regarding the claimed basis of right for the diversion and the extent of consumptive use of water. Concurrently, compliance inspections of permitted and licensed water rights will be performed to assess overall existing rights and compliance with terms and conditions. If and when illegal diversions are found, diverters will be subject to enforcement action and they will be directed to cease diversions, obtain a legal water right, or pursue a contract for water supplies with DWR, USBR or another party.

If adequate natural and abandoned flows continue to be unavailable to meet water quality and flow objectives, the State Water Board may take additional actions. Water conservation requirements will be considered as will a proceeding to ensure that natural and abandoned flows are not diverted when they are needed to meet flow objectives.

These activities will be closely coordinated with all other aspects of this workplan and other outside processes, including BDCP.

Activities, Products, and Timeline:

- **October 2008 – January 31, 2009:** Analyze and correlate State Water Board's water right records with property ownership, aerial photographs, crop mapping information, and data from DFG pertaining to diversion works. Compile data on a tracking database.
- **February 15, 2009:** Prepare and mail property owners a contact letter informing them of the Project and requesting information about the basis of their water rights. The contact letter will give water diverters 60 days to submit evidence of an existing water right or to cease and desist from illegal diversions. The letter will warn them that the State Water Board will take formal enforcement action if it determines that illegal diversions are occurring. Some projects will be prioritized for site inspection based on the responses to the contact letter and/or Division of Water Rights' records.
- **April – September 2009:** Division of Water Rights staff will initially categorize and prioritize responses by the type of water right claimed by the diverter, e.g., riparian, pre-1914, post-1914, contractual, or groundwater right. The State Water Board will analyze individual claims based on submitted and available information. State Water Board staff will schedule and conduct field inspections or aerial reconnaissance of facilities whenever necessary.
- **November - December 2009:** Prioritize and prepare enforcement actions, including corrective action letters, Administrative Civil Liability complaints, and Cease and Desist notices. Issue notices of enforcement actions. If hearings are requested, the time necessary for scheduling and conducting enforcement hearings is not considered in this project.
- **December 2009 – Ongoing**: As warranted, conduct additional water right investigations and enforcement actions. Assess whether actions beyond identification of illegal diversions should be initiated.

Resources: The six PYs of the Division of Water Rights' Compliance and Enforcement Unit will be committed to the initial investigations until completion. Resource needs for additional investigations will depend upon the scope of those activities.

Water Use Efficiency

Goal: The goal of this project is to promote the efficient use of water supplies and the protection of beneficial uses of water from the Bay-Delta and areas throughout the State.

Objectives: The objectives of this project are to increase sustainable water supplies available statewide to meet existing and future beneficial uses by: 1) increasing recycled water use by 980,000 acre-feet per year by 2020 in excess of 2002 levels, 2) achieving a 20 percent reduction in per capita water use statewide by 2020 and 3) encouraging more efficient agricultural water use.

Impetus: Water conservation will reduce the demand for water throughout the State, thus assisting in the protection of beneficial uses in the Bay-Delta and promoting the reasonable and efficient use of the State's limited water resources in the Bay-Delta and statewide. Governor Schwarzenegger has identified water conservation as a key action to provide water for California and to protect and improve the Bay-Delta ecosystem. The Delta Vision Blue Ribbon Task Force also recommended that the State Water Board consider water conservation as a top priority in its Bay-Delta strategic workplan. The State Water Board has also identified water conservation as a critical activity in its draft strategic plan. While many voluntary approaches to water conservation currently exist, stronger and more effective measures should be considered.

Background: The Delta and its tributary streams are the source of water for much of the State. Exports from the Delta provide water supply as far as the southern boundary of the State. Several major water projects export water from within the Delta or from upstream watersheds, including: the SWP, the San Francisco Hetch Hetchy water system, and the East Bay Municipal Utility District Mokelumne River water system. Other water projects, notably the CVP, though it mostly moves water within the basin, result in consumptive losses and reduced flows within many reaches of streams. Pumping from the Delta also alters the natural flow regimes which has consequent ecological effects. How that water is used and reused can have a direct link to diversions from the Delta. Water use efficiency, which is defined in California water management to include water conservation and water recycling, has a significant potential to assist the State in meeting its growing water needs.

Water conservation within the watershed of the Delta, as well as within areas served by water exported to other hydrologic basins, reduces water demands and associated stream and Delta diversions from levels that would have occurred without conservation. Water recycling does not reduce water demands but can serve as an alternative water supply. Water recycling within the Delta watershed may have minimal net water supply benefit to the Delta because water recycling reduces treated wastewater discharges that return flows to the Delta. The greatest water supply benefit is achieved by reusing treated wastewater that

would otherwise have been discharged to the ocean or other water bodies that are not easily usable as water sources. When recycled water is delivered to meet water demands in areas served by water exported from the Delta, additional water is made available to meet other beneficial uses for water from the Delta.

On-going and new conservation and recycling activities, however, transcend the needs of the Bay-Delta system and this strategic workplan in light of their statewide importance. Water conservation and recycling are being promoted as State policy as a means of addressing the statewide needs for an adequate and reliable water supply to serve a growing population. Conservation and recycling also may serve to reduce green house gas emissions in comparison to alternate water supplies, and they serve as adaptive responses to climate change because they increase local water supplies and water reliability. Governor Schwarzenegger established a goal in February 2008 to achieve a 20 percent reduction in per capita urban water use statewide by 2020. The strategy to achieve the Governor's goal is still being developed. These activities are being addressed in the State Water Board's "Strategic Plan Update 2008-2012." While many of these activities are occurring independently of the Bay-Delta strategic workplan, they nevertheless complement other activities in this workplan intended specifically to improve the Bay and Delta. Special emphasis will be given to Water Boards' water conservation and recycling actions that particularly benefit the Delta. Numeric objectives are being established for water recycling and urban water conservation, based on estimates of statewide potential for recycling and the Governor's goal for water conservation.

Agriculture is recognized as a major water use sector in California. Agricultural water use accounts for 79 percent of total water use in California, excluding environmental uses. While farmers are adopting more water-efficient practices, much potential remains. Estimates of potential agricultural water conservation in the California Water Plan Update 2005 range from 185,000 to 2,917,000 acre-feet per year by 2030. While there are insufficient data to establish a numeric objective, activities will take place to encourage agricultural water conservation and attempts will be made to measure progress over time.

The California Constitution, article X, section 2, and Water Code section 100 prohibit the waste, unreasonable use, unreasonable method of use, and unreasonable method of diversion of water. The State Water Board has broad authority under these provisions and under Water Code section 275, which directs the State Water Board to "take all appropriate proceedings or actions" to prevent waste or violation of the reasonable use standard. The State Water Board can exercise its broad authority where the implementation of water conservation measures or water recycling would prevent waste and unreasonable use, thus resulting in reduced diversions from the Delta or increased flows into the Delta. The State Water Board's authority to conduct the

water conservation and water recycling activities described below is grounded in these constitutional and statutory provisions.
Several near-term and long-term water use efficiency activities are planned as part of the Bay-Delta strategic workplan to address urban and agricultural water conservation and water recycling. Several options that have been considered are briefly described below.

- The State Water Board could conduct adjudicative proceedings where urban or agricultural water use is higher than similar uses in similar locations or circumstances. An investigation would be performed to determine the reasonableness of water use and an order issued to prevent the waste, unreasonable use of water, unreasonable method of use, and unreasonable method of diversion of water.

- Urban per capita water use for water suppliers in California has been found to range from 84 to 551 gallons per day. While there are many reasons for such a range, inefficient water use is certainly one factor. Urban suppliers play a significant role in educating and providing incentives for customers to conserve. Over 260 urban water suppliers representing nearly 75 percent of the State's urban water supply have subscribed to BMPs defined in a Memorandum of Understanding (MOU) with the California Urban Water Conservation Council, but compliance has been weak. The State Water Board could assess which of the 14 BMPs identified in this MOU should be mandatory, and initiate a proceeding to mandate some or all of the BMPs on a statewide basis. At a minimum the State Water Board could mandate use of water conserving retail water rate structures such as tiered water pricing. The State Water Board could focus on suppliers to improve compliance where per capita urban water use is significantly higher than average use under similar hydrologic conditions and commercial and industrial water demands.

- Urban development and the reliance on traditional storm drain systems have reduced opportunities for stormwater infiltration in many areas of the State. As a consequence, precipitation that might otherwise infiltrate, is discharged, and subsequently unavailable for future use. The State Water Board could promote development of infiltration facilities on a regional scale to increase groundwater supplies.

- Volumetric based water pricing (charging for water based on metered water deliveries) translates increased water use into increased cost to the consumer, providing an incentive to conserve. This is the basis of requiring water meters in urban areas. This incentive can be enhanced by charging higher water rates when consumers purchase greater amounts of water and discounted rates for significantly reduced deliveries. This form of tiered water pricing, called inclining or inverted block water rate structures, can be a required standard for urban water suppliers. The

State Water Board could evaluate various methods to require or encourage tiered water pricing, such as supporting legislation, adopting regulations, requiring conditions as part of funding programs, or other methods.

- The State Legislature has recognized the importance of recycled water as a source of water to meet growing water demands and alleviate stress on other water supplies (e.g., Wat. Code, §§ 13510-13512). A bill passed in 2001 required creation of the 2002 Recycled Water Task Force to identify constraints, impediments, and opportunities for increased use of recycled water. The Task Force concluded its work with a report in 2003 to the Legislature. Based on projections in the Task Force report, subsequently reflected in the California Water Plan Update of 2005, California has the potential to recycle an additional 980,000 acre-feet per year of water beyond 2002 levels by the year 2020 (the 2002 recycled water deliveries were 525,000 acre-feet per year). This would be about 23 percent of the available municipal wastewater. The potential increases over time as population growth results in increases of both wastewater produced and water demands. By 2030, the Task Force estimated the recycled water potential would increase to about 31 percent of available municipal wastewater.

  In furtherance of State policy promoting the use of adequately treated reclaimed water to supplement existing surface and underground water supplies, the State Water Board has required all applicants in a water-short area that propose a discharge of wastewater to the ocean to explain why the effluent is not being reclaimed for beneficial use. (State Water Board Order No. WQ 84-7 [citing Wat. Code, § 13142.5, subd. (e)(1)].) The State Water Board could expand this requirement by requiring the development of water recycling plans, through the NPDES/WDR renewal cycle, for wastewater treatment plants located in areas using imported water supplies and to require these applicants to recycle at least 25 percent of their wastewater by 2020 unless a reasonable justification is provided why the target is not being met.

- Currently, urban water suppliers that provide water to more than 3,000 customers or supply more than 3,000 acre-feet annually must submit urban water management plans to DWR every five years. Compliance with this requirement is necessary to receive State funding from certain bond sources that are administered by the State Water Board. Legislation was enacted in 2007, Assembly Bill (AB) No. 1420 (Stats. 2007, ch. 628), that requires implementation of demand management measures as a condition of receiving certain grants or loans from the State Water Board, DWR, and the California Bay-Delta Authority (Wat. Code, § 10631.5). Eligibility criteria are to be established by DWR. The requirements of AB 1420 take effect on January 1, 2009. The State Water Board is working

with DWR to implement these requirements.

- Agricultural water suppliers supplying more than 50,000 acre-feet of water annually were required by law to submit a one-time informational report to DWR in 1991 to address water management and conservation practices. Urban water suppliers are required to submit urban water management plans every five years. Consideration may be given to requiring agricultural water suppliers to file reports at the same five-year intervals.

- Adequate measurement and reporting of agricultural water use is essential for establishing water policy and determining the effectiveness of water conservation strategies. Annual or triennial reports are currently required to be submitted to the State Water Board for permitted or licensed surface water diversions with some exceptions. Other water right holders, such as riparian water users, are required to submit statements of diversion of use, but there are exceptions to this requirement and there is no penalty for failing to submit the required information. (Wat. Code, § 5100 et seq.) Agricultural water suppliers that supply 2,000 acre-feet or more of surface water annually or serve 2,000 or more acres of agricultural land are currently required to submit annual reports of delivery data to DWR (Wat. Code, § 531.10). Groundwater is a significant water supply source, leading to groundwater overdraft in many regions. Better water use measurement and reporting that documents both surface and groundwater agricultural water use is needed to provide a more complete assessment of water supplies, including the impacts of groundwater pumping on groundwater overdraft.

- In 2007, the Legislature enacted AB No. 1404 (Stats. 2007, ch. 675) to coordinate the collection, management, and use of water use data by various state agencies. The statute requires submission of a feasibility report to the Legislature on the coordinated water measurement database by January 1, 2009. (Wat. Code, § 531.5.) The report must include urban and agricultural water measurement data related to deliveries, diversions, water right permit and license information, and other information. The State Water Board is the lead agency on this project.

- Urban water use BMPs and agricultural efficient water management practices (EWMPs) have been identified and generally accepted. However, concern has been expressed that some BMPs or EWMPs are not suitable in certain situations and that, based on new research and technology, other BMPs or EWMPs should be adopted as standard practice.

Scope: The focus of water recycling activities will be on the reuse of treated municipal wastewater. The focus of water conservation will be on both urban and agricultural water use, with greater emphasis on urban water use while

agricultural water management practices and associated water conservation opportunities become better defined. The benefits to be realized in the Bay-Delta are increased inflows to, and the reduction of diversions from, the Delta. Thus, water conservation activities are promoted in all areas receiving water supplied from the Delta and its tributaries, and water recycling activities are promoted in areas served by water supplies exported from the Delta basin and where wastewater is discharged to water bodies from which the water is not easily recovered, especially discharges to the ocean.

Activities, Production, and Timeline:

Short-term Water Conservation Activities

- **August 2008-August 2011:** Assess which of 14 BMPs identified in the California Urban Water Conservation Council MOU, in addition to retail water rate structures such as tiered water pricing, should be made mandatory through regulation. Adopt regulations and prepare CEQA documentation to require urban water suppliers to implement these mandatory BMPs. At a minimum, urban water suppliers that have installed water meters in part or all of their retail water service areas will be required to charge metered customers using a rate structure that provides an incentive to water users to conserve and eliminate waste or unreasonable use of water, such as a tiered water rate structure based on volume of use.
  Resources Needed: 1.5 PY; additional staff and funding needs to prepare required CEQA documentation will be determined once mandatory BMPs have been identified.
- **January 2009-December 2012:** Identify two areas or suppliers within the Delta watershed, or that receive water supplies from the Delta, one urban and one agricultural, with high water use and where excessive agricultural water use is lost through evaporation or flows to a saline sink, and conduct adjudicative proceedings to determine the reasonableness of such use and to prevent the waste, unreasonable use of water, unreasonable method of use, and unreasonable method of diversion of water. For the agricultural area, identifying the quantity of evaporation (separate from transpiration) is an analytical focal point for the analysis.
  Resources Needed: 1.5 to 2.0 PY
- **April 2008-October 2008**: Work with multi-agency team to quantify and develop a state strategy to achieve the goal of reducing urban per capita use by 20 percent statewide by 2020. The team consists of State and federal agencies, including the State Water Board, DWR, the California Public Utilities Commission, the California Department of Public Health and the California Energy Commission. DWR is the lead agency and will use a contractor to assist in public outreach and preparation of a multi-agency strategic plan by October 2008. The State Water Board will act on additional water conservation activities identified in the multi-agency strategic plan.

Resources Needed: 0.1 PY; additional staff and fund needs will be developed upon completion of the State strategic plan by the multi-agency team.

- **April 2008-January 2009:** As required by Water Code section 531.5, in collaboration with DWR, the Department of Public Health, and the California Bay-Delta Authority, prepare a report to the Legislature to evaluate the feasibility, estimated costs, and potential means of financing a coordinated water measurement database. Appropriate water rights data will be included in the database. The report will be submitted to the Legislature by January 1, 2009.
  Resources Needed: 0.5 PY, $200,000 for contract services

Long-term Water Recycling Activities

July 2010–Ongoing: Adopt and implement a State policy for water quality control to require the development of Water Recycling Plans, through the NPDES/WDR renewal cycle, for wastewater treatment plants located in areas using imported water supplies and require these NPDES/WDR applicants to recycle a percentage of wastewater within a particular timeframe as may be required by the State Water Board in its water recycling policy. Require all permittees in areas importing water to justify in each permit cycle why effluent is not being reclaimed for beneficial use.
Resources Needed: up to 2.0 PY

Resources: The resource needs for each activity are provided above. Staff will need to be redirected from other activities within the State Water Board to perform many of these activities. Contract resources are already dedicated to conduct the database evaluation.

Other Activities

Delta Smelt Refuge Population

Background: The State Water Board in Resolution No. 2007-0078 authorized funding in the amount of $600,000 from the Cleanup and Abatement Account to cover expenses necessary to establish and maintain a delta smelt refuge at Byron through December of 2008. Approval has been obtained to disperse funds from the Cleanup and Abatement Account to reimburse expenses for establishing and maintaining the refuge. The State Water Board will disperse funds upon receipt of invoices.

Future Activities: The State Water Board will continue to monitor and track the development and maintenance of a refuge population of delta smelt and other species and will take actions, as appropriate, to ensure that funding and other resources for refuges are sustained as long as necessary.

Screening Diversions in the Delta and Tributaries

Background: Fish in the Delta may be affected both directly and indirectly by Delta water diversions. Diversions can cause entrainment and impingement of fish residing in, or migrating through, Delta channels and can affect flow through certain channels, which is believed to impact fish in a variety of ways. However, the complex interactions are not well understood. DFG surveys have identified approximately 2,300 diversions in the Delta. Approximately 200 of the 2,300 diversions are screened and fewer than 700 of these diversions are identified in the State Water Board's water rights database. These unidentified diversions may be attributable to movable points of diversion already reported to the State Water Board, riparian, or Pre-1914 appropriate diversions that are not required to report their diversion and use information to the State Water Board, or illegal diversions.

Future Activities*:* The State Water Board will work with DFG to: 1) develop and implement, as appropriate, a fish entrainment monitoring program, and to evaluate effects of diversions from the Delta on resident or migrating fish in the Delta; and 2) evaluate the need for, and as appropriate require, certain Delta water users to screen their water diversions to prevent entrainment or impingement of fish.

Minimum In-Stream Flow Standards

Background*:* Widespread declines in several species of both anadromous and resident fish highlight the need to review tributary streamflow conditions to ensure that conditions in tributaries are sufficient for the protection of fish and wildlife during all life stages, and that hydrodynamic conditions in the Delta do not cause adverse conditions. Public Resources Code section 10000 to 10005 sets forth a process by which DFG will make recommendations on streamflows needed for fish and wildlife to the State Water Board. The State Water Board

considers those recommendations when it processes new water right applications. The State Water Board also has continuing authority to manage and amend existing water rights to ensure the protection of public trust resources, including fisheries needs. The State Water Board has used this process to review and revise water right permits issued to the Los Angeles Department of Water and Power from Mono Lake and permits issued to the Yuba County Water Agency in Yuba County.

The Water Boards' draft 2008 Strategic Plan Update includes actions to maximize the efficient use of Water Board and other agency staff to initiate actions to ensure that adequate streamflows are available for the protection of fish and wildlife habitat while meeting the need for diversion of water for other uses.

Future Activities*:* The State Water Board will work with DFG and other watershed partners to develop a preliminary list of priority California streams for minimum stream flow standards development, including at least one stream tributary to the Delta or Suisun Marsh. State Water Board staff will then identify one minimum streamflow proposal affecting the Delta or Suisun Marsh that will be brought before the State Water Board for consideration and work with watershed partners on voluntary actions to implement actions necessary to achieve the streamflow. Where minimum flow standards have been developed and are not being met, the State Water Board will determine what State Water Board-mandated actions (such as conservation, recycling, and limiting amount of water diverted) are necessary to protect the public trust by preventing waste or unreasonable uses or methods of diversion.

Salinity Management Plan for the Central Valley (CV-SALTS)

Background*:* The Water Boards have initiated a comprehensive effort to address salinity problems in the Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability referred to as CV-SALTS. Details are available at: http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/index.shtml .

This activity will be coordinated with the development of a salt and boron TMDL for the San Joaquin River described in the Water Quality and Contaminant Control Element under TMDLs.

Future Activities: Central Valley Regional Water Board staff will continue to work with stakeholders to develop CV-SALTS. By June of 2010, the Central Valley Regional Water Board will review the project to evaluate its progress and if a sustainable stakeholder group-based effort has not been established, the Board may direct staff to initiate a traditional Basin Planning approach to develop a salinity management plan.