

Issue List and Work Plan for the 2011 Triennial Review of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

To meet requirements of Section 303(c) of the Federal Clean Water Act and Section 13240 of the California Water Code, the Central Valley Regional Water Quality Control Board (Regional Water Board) reviews the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) every three years. The Basin Plan is the foundation for the Regional Water Board's water quality regulatory programs. The Basin Plan designates beneficial uses for water bodies in the Sacramento River and San Joaquin River Basins, establishes water quality objectives to protect those beneficial uses, contains implementation plans that describe the actions necessary to achieve water quality objectives, and describes the surveillance and monitoring activities needed to determine regulatory compliance and assess the health of the Basins' water resources. While the triennial review is used to direct the Regional Water Board's basin planning activities, it is not the venue to amend the basin plan.

The Triennial Review consists of conducting a public workshop to receive comments on water quality issues in the two Basins and preparing a work plan which describes the actions the Regional Water Board may take over the next three years to investigate and respond to the issues. The triennial review process includes a public solicitation and identification of issues that may need to be addressed through Basin Plan amendments. After public input is received, the Regional Water Board develops and adopts by resolution a priority list of potential issues that may result in Basin Plan amendments. The priority list is used to direct basin planning efforts over the next three years. Implementation of the work plan depends upon the Regional Water Board's program priorities, resources, and other mandates and commitments. Crucial to successful implementation of the actions is adequate support of the Regional Water Board's Basin Plan activities.

The Regional Water Board began the current Triennial Review by providing a 45-day public notice, culminating in a public workshop, to solicit comments on water quality problems. An information document was prepared to provide a status of the high priority issues from the last Triennial Review. The notice was mailed or emailed to the more than 2800 entities on the Basin Plan mailing list and published for one day in each of the five major newspapers covering the Basin Plan area.

The public workshop was held during the regularly scheduled Regional Water Board meeting on 13 August 2009 to receive oral comments. While comments submitted after the public workshop until the release of the draft work plan would have been considered in developing the draft work plan, no comments were provided. The Regional Water Board received a total of 12 written comments prior to the workshop and 5 verbal comments at the workshop. Staff prepared responses to all comments. In addition, staff also prepared responses to basin

planning comments received outside of the Triennial Review process such as basin planning comments received during the process of developing the 2008 Clean Water Act Section 303(d)/305(b) Integrated Report.

The issues listed below reflect the high priority water quality problems identified from public comments received during this review period and staff knowledge about problems in the Basins. The Triennial Review work plan consists of issues that are in various stages of development. Many of the issues have not been investigated by staff and detailed information was not provided in comments. These issues are described in broad conceptual terms. Before an issue can result in basin plan amendments, staff must investigate the issue to identify the scope of potential basin plan amendments in conformance with applicable federal and state laws and regulations. After determining that a basin plan amendment is the appropriate means to address the issue, information, including the development of scientific justification, is prepared to support the amendment. Then the potential amendment undergoes a structured public participation process before it can be presented to the Board for its consideration.

The list of issues far exceeds the staff resources allocated to planning activities. Existing resources only allow a small portion of the highest priority issues to be addressed. In addition to prioritizing the activities, the work plan identifies unfunded and inadequately funded issues for which the Regional Water Board will actively seek funding and will accept funding to accomplish.

Two levels of actions are specified. Current Actions represent the staff's best judgment about what can be done from FY 11/12 through FY 13/14 to address the issue with available resources. Additional Actions depend on more resources becoming available. Some stakeholders have provided funding for staff and studies to move certain issues forward. Also, other programs, such as the TMDL program, include resources to complete basin plan amendments. These other sources of funding are identified in the work plan. Even with other sources funding basin planning work, the existing basin plan budget is used to provide support in the preparation of basin plan amendments developed with these other sources of funding. The priority for each issue indicates the intended order to address the issues.

Based on the staff analysis, the following issues have been identified as high priority for the Sacramento and San Joaquin Rivers Basin.

- Salt and Nitrate Management
- Regulatory Guidance to Address Water Bodies Dominated by NPDES Discharges
- Regulatory Actions in Agricultural Dominated Water Bodies and Agricultural Conveyance Facilities
- Beneficial Use Designations

- Delta Issues
- Dissolved Oxygen Problems in the San Joaquin River near Stockton
- Pesticide Control Efforts
- Mercury Load Reduction Program
- Policies for Maintaining Water Quality for Drinking Water
- Protection of Central Valley Fisheries and other Aquatic Life
- Secondary MCLs as Water Quality Objectives

In addition to the above issues, the State Water Board is working on various plans and policies and it is necessary for Central Valley Water Board staff to expend resources to participate in these processes. In many cases, the resources to participate in the development of the State Water Board's plans and policies are from programs other than basin planning, such as NPDES, Water Quality Certifications, and TMDL. However, some of the plans and policies are most closely associated with basin planning and will require allocating some of our limited basin planning resources to assure that the Central Valley Water Board's priorities are considered. Issue No. 12 describes the Basin Plan Program resources used to follow State Water Board Plans and Policies. Basin planning resources are also used to implement Basin Planning priorities when the activities are not directly related to a regulatory program. These priorities include implementing the groundwater quality protection strategy described in Issue No. 14 and implementing policies on subsurface agricultural drainage. Recently, the Water Boards have started working together on multi-regional basin planning activities that could have staff working on lower priority issues in the short term but have the state-wide benefit of completing more basin plan amendments in the long run. A description of these multi-region projects is included in Issue No. 12.

The issues selected for the 2011 Triennial Review represent major water quality concerns based on what is currently known about them. Knowledge about pollution problems may change significantly from one year to the next.

The basin plan amendment process begins after sufficient studies and technical information has been gathered to develop the scope of the amendment. Resources are estimated based on conducting the information gathering phase and the basin plan amendment process as efficiently and quickly as possible. For many of the issues, staff has access to very limited technical information. Therefore the resource estimates are generic and may significantly underestimate the resources needed to gather the necessary information or to complete the actual basin plan amendment. For many of the issues, stakeholders have expectations of specific outcomes. Due to the lack of technical information readily available to staff, the outcome of these issues is uncertain and cannot be determined at this time.

The following issue descriptions are mainly based on stakeholder comments and may include stakeholder expectations. As explained above, outcomes are uncertain until further information has been gathered. Available technical information and statutory and regulatory requirements were used to provide context to the issues.

Issue 1: Salt and Nitrate Management for Surface and Ground Waters

Discussion:

Salinity: Salt management is the most serious long-term water quality issue in the San Joaquin River Basin. The causes include increased urban and agricultural development, over allocation of surface water supplies, diversion of high quality flows to outside the basin, salty return flows from agriculture and higher salinity water being imported into the basin. Approximately 600,000 tons of salt are imported annually into the western portion of the San Joaquin Basin (west of the San Joaquin River) for crop irrigation and wetland management via federal, state, and local water projects. An additional 160,000 tons are applied through irrigation from San Joaquin River diversions. Some of this salt is returned to the river through tail water return flows and some is stored in the soil. Most, however, is purposefully leached below the root zone to maintain salt balance in the root zone. Much of this leached salt ends up in the groundwater. Degradation of groundwater in the San Joaquin River Basin by salts is unavoidable without a plan to remove salts from the basin.

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled and boron levels have increased significantly. The Central Valley Water Board adopted a Control Program to implement salt and boron objectives in the San Joaquin River at Vernalis in 2004. However, this control program only deals with control of loads discharged to the River. Since groundwater inflow is a contributor of salt to the river and beneficial uses of groundwater are being impacted, a parallel control plan needs to be established for the control of salts to groundwater.

Even with a control plan, the use of the San Joaquin River to export salts creates additional problems. For example, salt that is being exported through the San Joaquin River is being

recirculated into the federal and State water project pumps and returned to the water users in the San Joaquin River Basin as well as to water users in the Tulare Lake Basin where there is no outlet for salt at the present time. Development of numeric water quality objectives for salinity is all the more important since the Central Valley Water Board allows the San Joaquin River to be used to remove salts from the Basin as long as water quality objectives are met. However, work to develop numerical objectives for salinity in the San Joaquin River upstream of Vernalis is still in progress.

In the Sacramento River Basin, salt buildup and control is rarely an intrabasin issue. However, an incremental increase in Sacramento River salinity exacerbates salinity problems in the southern basins and for all Delta exporters because of larger salt loads in their supply water.

In addition to basin-wide issues, there are local areas of potential groundwater problems due to disposal of wastewater from food processing, septic tanks, municipal wastewater, confined animal facilities, and numerous other types of industrial dischargers. With no basin wide infrastructure to isolate and export salt, there are only two alternatives for these dischargers: individually isolate the salt and store it in the basin or dilute it for reuse. Both have long-term consequences.

Nitrates. A 1988 State Water Board report to the State Legislature on Nitrate in Drinking Water¹ reported that 10 percent of the samples in STORET (the USEPA database) were above the primary Maximum Contaminant Level (10 mg/L nitrate-nitrogen). A geographical depiction of wells with levels of nitrate above background (greater than 4.5 mg/L nitrate-nitrogen) showed the highest densities in the Central Valley are close to the

¹ State Water Resources Control Board. 1988. Nitrate in Drinking Water Report to the Legislature, Report No. 88-11WQ, Division of Water Quality. October. The report is available at: http://www.waterboards.ca.gov/water_issues/programs/gama/docs/anton1988.pdf

Highway 99 corridor and primarily around population centers (e.g. Modesto, Yuba City, Fresno, and Bakersfield) and concentrated animal confinement areas (e.g. feedlots and dairies). Nitrate is one of the most frequently exceeded constituents in public supply wells.

The primary sources of nitrate in groundwater are application of nitrogen fertilizers, disposal or reuse of animal waste at confined animal production facilities, and individual sewer systems (septic systems). Groundwater in crop production areas can become contaminated with nitrate when nitrogen fertilizers are applied at rates in excess of crop utilization and inefficient irrigation or high rainfall leach the nitrate to groundwater. Other factors that put groundwater at risk are a shallow aquifer, the absence of a restricting layer to vertical migration of nitrate, permeable soils and poor well construction.

In 2010, the US Geological Survey (USGS) released a report on nutrients in the nation's streams and groundwater². The Sacramento River Basin and the San Joaquin River Basin were two of the 51 hydrologic systems studied by the USGS in this report. Stream systems were categorized as draining agricultural, urban, mixed or undeveloped areas. Generally, nutrient concentrations in streams were found to be directly related to land use and associated fertilizer applications and human and animal wastes in upstream watersheds. Total nitrogen concentrations were highest in streams draining agricultural areas. Streams draining urban areas had concentrations of total nitrogen lower than streams draining agricultural areas but higher than background. Total phosphorus concentrations were highest in streams draining agricultural and urban areas. In groundwater, nitrate

² Dubrovsky, N.M., Burow, K.R., Clark, G.M., Gronberg, J.M., Hamilton P.A., Hitt, K.J., Mueller, D.K., Munn, M.D., Nolan, B.T., Puckett, L.J., Rupert, M.G., Short, T.M., Spahr, N.E., Sprague, L.A., and Wilber, W.G., 2010, The quality of our Nation's waters—Nutrients in the Nation's streams and groundwater, 1992–2004: U.S. Geological Survey Circular 1350, 174 p. Additional information about this study is available at <http://water.usgs.gov/nawqa/nutrients/pubs/circ1350>

concentrations were highest in shallow wells in agricultural areas that were associated with high fertilizer and manure applications. Nitrate concentrations were lowest in shallow wells in urban areas and in deep wells in major aquifers. Regardless of land use and nitrogen sources, nitrate concentrations were significantly higher in well-oxygenated groundwater. The human health findings were that nitrate concentrations in streams seldom exceeded the MCL but 83% of studies of shallow groundwater in agricultural areas had one or more samples with a nitrate concentration greater than the MCL. Concentrations exceeding the MCL were less common in public-supply wells.

The Central Valley Water Board may address nutrients from agricultural areas with the long-term irrigated lands regulatory program which is now under development.

In 1993, the Central Valley Water Board conducted a survey of groundwater beneath five typical well operated dairies in the vicinity of Hilmar. The average nitrate-nitrogen concentration beneath these dairies was 49 mg/L with a maximum value of 250 mg/L. This far exceeds the drinking water standard of 10 mg/L. Conditions were conducive to migration of nitrates to groundwater as soils are highly permeable (sandy) and the water table is shallow (4 to 25 below ground surface). There are 1600 dairies in the Central Valley with over 1 million milking cows. In 2007, the Central Valley Water Board adopted general waste discharge requirements to control nutrients from existing confined animal production facilities.

With respect to individual septic systems, the Central Valley Water Board has dealt with these on a case-by-case basis by prohibiting discharge in problematic service areas. Twenty-six prohibitions have been adopted by the Central Valley Water Board. The Central Valley Water Board has also adopted guidelines for use of septic tank systems in developments. Staff has

encouraged counties to adopt and enforce ordinances that are consistent with the guidelines. However, these guidelines are now outdated and the State Water Board is working on regulations. See Issue No. 12 for more information on State Water Board plans and policies.

Triennial review comments indicate that wineries might be an area of concern. Wineries can produce substantial quantities of stillage waste which is high in concentrations of BOD, EC, TDS, and nitrogen. The Basin Plan includes guidelines for the disposal of stillage waste that are based on a study conducted in 1980. The Basin Plan notes that the guidelines represent minimum requirements for disposal of stillage waste from wineries and do not preclude the establishment of more stringent requirements to comply with water quality objectives and protect beneficial uses of surface and ground waters.

CV-SALTS: In recognition of these salt and nitrate issues, the Central Valley Water Board, the State Water Board, and stakeholders began a joint effort to address salinity and nitrate problems in the Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. This effort is expected to include evaluation of beneficial uses and water quality objectives for salt and nitrate constituents as well as development of a comprehensive implementation program. CV-SALTS is also the venue for coordinating the development of the salt and nutrient management plans from the State's Recycled Water Policy. However, as indicated in triennial review comments, participants realize that addressing salt and nitrates concerns will go beyond basin planning and the Water Boards.

CV-SALTS is expected to be a comprehensive effort that may take a number of years to

complete. While CV-SALTS is in progress, it is important for all stakeholders to be involved in developing solutions. However, many stakeholders are being required by regulatory requirements to focus on local issues. Therefore, it is important for the Water Boards to provide an atmosphere conducive for stakeholders to maintain their focus on CV-SALTS.

The State Water Board is responsible for a water quality control plan that spans the San Francisco Bay and the Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan). The State Water Board is currently reviewing the southern Delta salinity and San Joaquin River flow objectives. This review provides information that is useful for CV-SALTS and the efforts must be coordinated to provide a holistic solution. This review may address the regulatory concerns of some of the individual dischargers and allow these dischargers to participate fully in the CV-SALTS efforts.

Stakeholders have requested that the Central Valley Water Board develop an implementation program to achieve the water quality objectives in the Bay-Delta Plan for dischargers of salt. To avoid duplication, the need for an implementation program should be assessed after the State Water Board completes its review of the southern Delta salinity and San Joaquin River flow objectives and after the CV-SALTS effort is completed.

Priority:

High

Current Action:

Staff is working with a stakeholder coalition on CV-SALTS. In order to improve coordination with participants of CV-SALTS, the development of salinity water quality objectives for the Lower San Joaquin River is now one of the CV-SALTS activities. Stakeholders have developed a workplan to complete the CV-SALTS activities.

Staff is also exploring potential options to provide incentives for stakeholder participation in CV-SALTS.

Current Resources: Stakeholders are expected to participate in CV-SALTS and provide the necessary input to conduct the basin planning activities. Staff participating in CV-SALTS is funded from basin planning and nonpoint source resources. (2 PYs)

Discussions with stakeholders and other regulatory agencies over potential short-term regulatory solutions are funded by basin planning resources. (0.1 PYs)

Additional Action: The stakeholder work plan estimates that \$22 to \$42 million will be needed to complete the CV-SALTS activities. Stakeholders are expected to develop a funding mechanism to obtain resources needed for CV-SALTS activities.

Current actions cover staff assistance on the comprehensive CV-SALTS effort. However, the effort may be made up of a number of projects for which staff efforts are not funded. As these projects are identified and implemented, resources are needed for appropriate levels of staff involvement.

While CV-SALTS is under development, there is a need to develop an interim regulatory solution for dischargers adversely affected by salinity regulation.

Additional Resource Requirements:

- 1) Staff – Since stakeholders are expected to develop a funding mechanism to complete CV-SALTS activities, the existing staff resources are adequate. However, CV-SALTS includes a number of project that will require an additional 0.5 PYs per year per project for staff. For the interim solution, an additional 0.3 PYs per year for two years will be needed.
- 2) Contract(s) – Stakeholders estimate that \$22 to \$42 million is needed to complete CV-SALTS activities and stakeholders are expected to develop a funding mechanism. For the interim solution, an additional \$100,000 will be needed.

Issue 2: Regulatory Guidance to Address Water Bodies Dominated by NPDES Discharges

Discussion:

It is sometimes difficult and expensive for dischargers to meet water quality objectives in water bodies dominated by NPDES discharges, also known as effluent dominated water bodies (EDWs). Where little or no dilution is available, effluent limits are set at the applicable water quality criterion/objective which may be more stringent than drinking water MCLs in order to protect aquatic life beneficial uses. In addition, the water quality objectives for turbidity and temperature are based on allowing only limited changes to background conditions. However background stream conditions can fluctuate and respond more quickly to environmental changes (i.e., rainfall, changes in air temperature) than effluents from wastewater treatment facilities. Stakeholders have commented that, in some cases, wastewater treatment plants are capable of discharging high quality effluent that would fully support beneficial uses and yet still be in violation of the Basin Plan. The consistent flows provided by the wastewater discharge may also enhance some aquatic life beneficial uses but be detrimental to others that depend on the ephemeral nature of the stream. The original conditions in the stream may change, causing a shift in the specific uses within a beneficial use category (i.e. a shift from the unique uses of ephemeral waters to the uses of perennial waters). There are questions of whether the discharger should be required to fully protect these shifted uses when it is the discharge itself that allows the modified uses to exist at all. There are also questions regarding the fate of the original uses that are lost due to the discharge.

Stakeholders have suggested that the assigned beneficial uses of these water bodies are inappropriate and have requested that various alternatives be explored for assigning beneficial uses to EDWs. The alternatives suggested were to a) designate site specific beneficial uses, b) use “warm” and “cold” designations on a case by case

basis rather than applying the “tributary rule,” c) develop an EDW beneficial use which would consist of a limited warm water habitat, recreation and/or municipal use, d) adopt site specific objectives, or e) develop provisions for granting variances from compliance with water quality objectives. Further discussion regarding the designation of beneficial uses is in Issue No. 4. In 1995 an Effluent-Dependent Water Bodies Task Force established by the State Water Board developed recommendations³ for providing reasonable protection for appropriate beneficial uses of effluent-dependent water bodies. Some of these recommendations might be appropriate to address stakeholder concerns.

All of the above alternatives can only be accomplished through the Basin Plan amendment process. They cannot be performed during the permit adoption process. Studies necessary to comply with Clean Water Act and California Water Code requirements for amending the basin plan have not been completed for most EDWs. Because of the number of water bodies where action is needed, alternative policies and actions would allow the most efficient use of resources.

The Central Valley Water Board has adopted several basin plan amendments that address EDW concerns. In 2003, the Central Valley Water Board adopted site specific water quality objectives for pH and turbidity for Deer Creek in El Dorado County. This provided the approach used for a regionwide amendment to revise the pH and turbidity water quality objectives in 2007. Since 2003, the Central Valley Water Board adopted site specific water quality objectives for temperature for Deer Creek in El Dorado County, and de-designated several beneficial uses of Old Alamo Creek in Solano County. In May 2010, the Central Valley Water Board adopted site specific water

³ State Water Resources Control Board. 1995. Report of the Effluent-Dependent Waters Task Force for Consideration of Issues Related to the Inland Surface Waters Plan. October. The report is available at:
http://www.waterboards.ca.gov/publications_forms/publications/general/docs/effluent-dependent-waters-1995.pdf

quality objectives for several trihalomethanes for New Alamo and Ulatis creeks in Solano County and implementation provisions for NPDES dischargers to Old Alamo Creek. These amendments provide an approach for similar situations.

Priority: High

Current Action: None

Current Resources: None

Additional Action: Following the example of pH and turbidity, it would be efficient to explore whether the approaches used for site-specific basin plan amendments can be expanded to regionwide basin plan amendments. Otherwise, it is still important to conduct individual amendments that deal with different aspects of the EDW issue to address regulatory issues as well as provide information that would be useful for geographically larger basin plan amendments.

Additional Resources Requirements:

- 1) Site-specific amendments require roughly 0.5 PY per year for three years. A more generic amendment would probably take 1.0 PYs per year for two years to develop an approach. Resource needs and time frames after the first two years will depend on the approach.
- 2) Contract(s) -- Approximately \$200,000 to conduct studies per site-specific basin plan amendment. These studies include the scientific justification, environmental assessment and economic analysis. A more generic amendment would probably require \$500,000 or more to conduct studies.

Issue 3: Regulatory Actions in Agricultural Dominated Water Bodies and Agricultural Conveyance Facilities

Discussion:

In agricultural environments, a complex network of modified natural and constructed channels convey irrigation supplies to farms and export agricultural drainage water to natural streams. Many of these waterways lack habitat and physical flow characteristics to sustain the full range of aquatic life and other beneficial uses. Based on information that the Central Valley Water Board staff collected in 1992, it is estimated that more than 130 natural water bodies, totaling more than 1100 miles, are dominated by agricultural drainage and supply water in the Sacramento and San Joaquin River Basins. There are more than 5100 water bodies, totaling over 11,000 miles, which were identified as constructed facilities designed to carry agricultural drainage and supply water. There are more than 75 water bodies, totaling almost 600 miles that are natural dry washes that have been altered to carry agricultural supply or drainage water.

Some of these water bodies were deliberately modified for the purpose of providing support to the agricultural industry. Stakeholders have commented that fully protecting the assigned beneficial uses would result in loss of the agricultural functionality of the water body. Therefore, stakeholders have requested that the Central Valley Water Board develop plans and policies that recognize that the functionality of the modified water body should take precedence over any perceived beneficial uses. In 1995 an Agricultural Waters Task Force established by the State Water Board developed recommendations⁴ for providing reasonable protection for beneficial uses of agricultural waters. Some of these

⁴ State Water Resources Control Board. 1995. Report of the Agricultural Waters Task Force for Consideration of Issues Related to the Inland Surface Waters Plan. October. The report is available at:
http://www.waterboards.ca.gov/publications_forms/publications/general/docs/inland_surface_plan_b.pdf

recommendations might provide an approach to addressing stakeholder concerns.

All of the approaches suggested above require amending the Basin Plan. All amendments would need to comply with the California Water Code and the Clean Water Act.

Priority: High

Current Action: None

Current Resources: None

Additional Action: The most efficient use of limited resources is to develop a strategy to specifically address agricultural dominated water bodies. It will probably be necessary to divide these water bodies into groups with specific characteristics that would facilitate developing policies regarding appropriate beneficial uses, water quality objectives and/or implementation provisions.

Similar to the EDW issue (See Issue No. 2), it may be necessary to conduct site-specific basin plan amendments to explore various approaches that could be used in a more generic amendment.

Additional Resource Requirements:

- 1) Staff – 1.0 PYs per year for two years to develop an approach. A more generic amendment would probably take 1.0 PYs per year for two years to develop an approach. Resource needs after the first two years will depend on the approach. Site-specific amendments require roughly 0.5 PY per year for three years.
- 2) Contract(s) -- At least \$500,000 to conduct studies to support a basin plan amendment with a generic strategy. Site-specific amendments require about \$200,000 per basin plan amendment.

Issue 4: **Beneficial Use Designations for Surface and Ground Waters**

Discussion: The Basin Plan designates beneficial uses to surface waters in three different ways: (1) Table II-1 lists existing and potential beneficial uses that apply to surface waters of the basins; (2) The beneficial uses of any specifically listed water body generally apply to its tributary streams; and (3) The Basin Plan implements State Water Board Resolution 88-63 (“Sources of Drinking Water Policy”) by assigning municipal and domestic supply uses (MUN) to all unlisted water bodies.

The Basin Plan states that all ground waters in the Region are suitable or potentially suitable for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

Dischargers to both effluent and agricultural dominated surface water bodies question the appropriateness of the designated beneficial uses. There have also been questions on how to protect water bodies with apparent conflicting beneficial uses such as both WARM and COLD.

Adjustments to designated beneficial uses for surface and ground waters can only be made through the Basin Plan amendment process. Changes to surface water beneficial uses that result in less stringent criteria must be supported by a scientific analysis as described in Title 40 Code of Federal Regulations (CFR) §131.10(g). Further discussion regarding issues specific to effluent or agricultural dominated water bodies is contained in Issues No. 2 and 3.

The State Water Board determined in Order No. 2002-0015, “... where a Regional Board has evidence that a use neither exists nor likely can be feasibly attained, the Regional Board must expeditiously initiate appropriate basin plan amendments to consider dedesignating the use. Moreover, the Regional Board can require dischargers to the affected water body to provide assistance, through data collection, water quality-

related investigations, or other appropriate means, to support and expedite the basin plan amendment process.”

Stakeholders have indicated that there is information that supports reviewing specific beneficial uses of the following water bodies: (1) West Squaw Creek; (2) Grassland wetland water supply channels for RARE, REC1-and REC2; (3) Upper North Fork Feather River from Lake Almanor to Lake Oroville; (4) Pit River; (5) South Yuba River between Lake Spaulding and Englebright Reservoir; (6) Willow Creek in Madera County; (7) Pleasant Grove Creek; (8) Kellogg Creek; (9) Fresno River above Hensley Reservoir; (10) Calaveras River from the San Joaquin River to the Stockton Diverting Canal and from the Stockton Diverting Canal to below the weir; (11) the unnamed tributary to Powell Slough, and Powell Slough tributary to the Colusa Basin Drain; and (12) groundwater in the vicinity of the Littlejohns Fault in Calaveras County

Stakeholders have identified the following categories of water bodies as deserving review: (1) Long water body reaches (i.e. water bodies reaches that are so long that the characteristics of the water body change within the reach), especially water bodies that have large changes in elevation, species assemblages and other characteristics; (2) Water bodies with both COLD and WARM beneficial use designations; and (3) agricultural water bodies that are designated MUN through the Central Valley Water Board’s application of the State Water Board’s Sources of Drinking Water Policy, such as the unnamed tributary to Powell Slough and Powell Slough, tributary to Colusa Basin Drain. Issues with water bodies dominated by NPDES discharges and agricultural dominated water bodies are included in Triennial Review Issue Nos. 2 and 3, respectively.

Priority:

High

- Current Action:** Staff is currently evaluating beneficial uses for West Squaw Creek, tributary to Shasta Lake; the unnamed tributary to Powell Slough and Powell Slough, tributary to Colusa Basin Drain; and groundwater in the vicinity of the Littlejohns Fault.
- Current Resources:** Stakeholders have funded staff to work on West Squaw Creek and the groundwater in the vicinity of Littlejohns Fault and provided for contractor assistance to develop any needed technical information. The NPDES program is funding work on Powell Slough and its unnamed tributary.
- Additional Action:** Because of the large number and size of the unlisted water bodies, developing a logical system of grouping some of the water bodies and assigning beneficial uses to the groups would be the most efficient use of resources. It would be useful to assemble and work with a stakeholder group to define the issues associated with any general classification system and to determine the best and most efficient approach to the assignment of beneficial uses. The starting point for grouping water bodies could be identifying water bodies that fit the exception criteria 2a and 2b in State Water Board Resolution No. 88-63 (Sources of Drinking Water Policy). One possible conclusion of additional studies could be that categorizing the water bodies will be technically infeasible and beneficial uses will need to be addressed on a site-specific basis.
- While grouping water bodies appears to be an efficient approach to addressing the beneficial use issues, the outcome is uncertain so securing funding is difficult. Another approach would be to select individual water bodies with notable characteristics for individual basin plan amendments with the goal of developing templates for similar water bodies. The approach for individual basin plan amendments is usually apparent early in the process and, therefore, has more certain outcomes. The Central Valley Water Board has adopted Basin Plan amendments addressing beneficial uses in Old Alamo Creek

and Sulphur Creek. These amendments provide the approach for removing beneficial uses.

**Additional Resources
Requirements:**

- 1) Staff -- For evaluating grouping of water bodies, 1.0 PY per year for the first two years is needed to further define this issue. Future needs would depend on the number and types of water body categories that are identified. For work on individual water bodies, 0.5 PYs is needed per year for three years for each water body.
- 2) Contract(s) -- Approximately \$500,000 is needed to help identify the scope of the grouped water body issue and group water bodies into logical categories. Future needs would depend on the types of water body categories that are identified. For individual water bodies, up to \$200,000 is needed per water body.

Issue 5:

Delta Issues

Discussion:

Various planning activities and strategies are under development that may affect water quality in the Bay-Delta. At the same time, various aquatic species in the Bay-Delta have experienced dramatic and unexpected population declines. The causes of Delta ecosystem problems are complex and not fully understood, but involve flow, habitat, invasive species, contaminant, and other stressors. The Water Board focuses primarily on contaminant issues, although it is also involved in habitat preservation and restoration, and invasive species control.

Staff of the Central Valley, San Francisco Bay and State Water Boards formed a Bay-Delta Team to coordinate activities to protect the beneficial uses of the Bay-Delta. The three Water Boards adopted resolutions supporting short-term and long-term actions to protect beneficial uses in the Bay-Delta, and then adopted the *June 2008 Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Strategic Workplan). The Strategic Workplan includes development and implementation of total maximum daily loads (TMDLs), development and implementation of a drinking water policy for the Central Valley, management of invasive species, and evaluation of effects of certain contaminants. The Strategic Workplan also includes establishment of a comprehensive monitoring program that coordinates monitoring and assessment efforts in and around the Delta. As the Bay-Delta Team implements the Strategic Workplan, it may become necessary to amend the Basin Plan to address specific issues.

Priority:

High

Current Action:

The Central Valley Water Board staff is working with staff from the State Water Board and the San Francisco Water Board through the Bay-Delta Team on activities described in the Strategic Workplan. The TMDL development and

implementation described in the Workplan are being addressed through the TMDL program. Delta TMDLs that involve Basin Plan Amendments are part of Issue Nos 1, 6, 7, and 8 (Salt and Nitrate Management, Dissolved Oxygen Problems in San Joaquin River near Stockton, Pesticide Control Efforts, and Mercury Load Reduction Program). Some of the Workplan activities include monitoring, conducting studies of the contaminants that have already been identified, and identifying new contaminants that are causing toxicity issues. In addition, the Central Valley Water Board works with the Interagency Ecological Program (IEP); Calfed Science Program researchers; and other stakeholders to coordinate efforts designed to identify, evaluate and address existing and potential sources of toxicity.

Staff work on water quality in the Delta indicates that ammonia levels appear to be a factor in causing beneficial use impacts. The USEPA Ambient Water Quality Criteria for Ammonia – 1999 and the draft USEPA criteria released in 2009 do not appear to adequately protect the beneficial uses of the Delta. Therefore, it is necessary for staff to coordinate with stakeholders and other interested entities to conduct studies and assessments to determine ammonia levels that will not adversely affect beneficial uses. It may be necessary to develop water quality objectives for ammonia to provide appropriate protection of beneficial uses of the Delta.

Staff is working with stakeholders to develop a Regional Monitoring Program (RMP) in the Delta. The RMP will allow more efficient collection and evaluation of Delta monitoring data, helping identify beneficial use impairments and other issues that may require Basin Planning action.

Invasive species contribute to Delta ecosystem problems. Staff participate in the California Agencies Aquatic Invasive Species Team, and are involved periodically in specific invasive species eradication efforts.

Current Resources: Central Valley Water Board Staff working on Delta issues is funded with general fund resources and SWAMP resources. (3.5 PYs) The Delta Team has secured contract funds to conduct Strategic Workplan activities.

Additional Action: As the Strategic Workplan activities are completed, it may become necessary for the Central Valley Water Board to develop Basin Plan Amendments to provide additional protection of beneficial uses in the Delta. These Amendments may include modification of beneficial uses, water quality objectives or establishment of implementation programs that would require further reductions in pollutant concentrations in discharges or additional monitoring by dischargers.

Additional Resource Requirements: To be determined based on the type of policies that will need to be developed for Central Valley Water Board consideration.

Issue 6: Dissolved Oxygen Problems in San Joaquin River near Stockton

Discussion: Low dissolved oxygen concentrations in the San Joaquin River in the vicinity of Stockton annually impact or threaten to impact beneficial uses. Water quality objectives are frequently violated during high temperature periods in late summer and early fall. Adult San Joaquin River fall run Chinook salmon migrate up river between September and December to spawn in the Merced, Tuolumne, and Stanislaus Rivers. The San Joaquin River population has experienced severe declines and is considered a species of concern by the US Fish and Wildlife Service. The San Joaquin River Restoration Program began interim flow releases from Friant Dam in the fall of 2009, with the mandate of reintroducing salmon to the River upstream of the Merced River by 31 December 2012, and providing full restoration flows by January 2014. Low dissolved oxygen in the San Joaquin River can act as a barrier to migration as well as kill or stress salmon and other species present in this portion of the Delta. Water ways in the vicinity of Stockton are on the Clean Water Act Section 303(d) list of impaired water bodies due to low dissolved oxygen. In addition, this part of the Delta was listed as a Toxic Hot Spot under the Bay Protection and Toxic Cleanup Program due to the low dissolved oxygen levels and a Cleanup Plan was adopted to address this issue.

In 2005, the Central Valley Water Board adopted a control program to achieve the dissolved oxygen objectives in the Stockton Deep Water Ship Channel. The control program presents a phased approach to address this issue. Required upgrades to the Stockton Wastewater Treatment Plant have reduced oxygen demanding substances in the effluent discharge, with a resultant improvement in river oxygen concentrations. A pilot oxygenation system has been installed at the Port of Stockton which appears to increase dissolved oxygen concentrations in the river. Efforts to provide

operation and funding for the aerator are part of the Dissolved Oxygen TMDL implementation.

Priority: High

Current Action: The Central Valley Water Board staff is evaluating the control program for the Stockton Deep Water Ship Channel. Studies required by the control program have not been completed due to State budget issues. Staff will be developing a proposal for Central Valley Water Board consideration.

Current Resources: Staff is funded with TMDL resources. (1 PY)

Additional Action: None

Additional Resource Requirements: None

Issue 7: Pesticide Control Efforts

Discussion:

Pesticides, when used properly, protect people and their environment from pests (animal, plant, or microbial) that threaten human health and human activities.⁵ However, pesticide residues that escape their intended use area may enter waters of the State and cause beneficial use impairments, particularly aquatic life impacts. Various pesticides have been detected at toxic levels in the Central Valley water bodies. The Basin Plan contains requirements relevant to pesticides, including narrative and numeric water quality objectives to protect beneficial uses. However, there are currently very few numeric water quality objectives for pesticides.

For water bodies on the Clean Water Act section 303(d) list of impaired water bodies, the Central Valley Water Board must develop load reduction programs to resolve these water quality problems through a Total Maximum Daily Load (TMDL) allocation process. In addition, the Basin Plan outlines a specific review process that the Central Valley Water Board must follow to address pesticide problems that are identified.

Organochlorines: Organochlorine (OC) pesticides have been detected in the water column, sediment and biota collected from water bodies throughout the Sacramento and San Joaquin River Basins at high enough concentrations to include these water bodies on the Clean Water Act section 303(d) list of impaired water bodies, even though most OC pesticides have been banned for use in the United States. Staff starting working on a Basin Plan amendment to establish TMDLs for several water bodies impaired for OCs in the Region.

Stakeholders have expressed concern regarding the water quality objectives for organochlorine pesticides which states that:

⁵ California Department of Pesticide Regulation, Pesticide Info Fact Sheet

Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.

Stakeholders are concerned that the water quality objective fluctuates with the accuracy of analytical methods and would prefer numeric water quality objectives that are protective of beneficial uses. Since the adoption of this water quality objective, the US Environmental Protection Agency has developed water quality criteria for organochlorine pesticides that are protective of human health and aquatic life and in 2000 promulgated the criteria in the California Toxics Rule (CTR). At this time, the detection limits for analytical methods approved by the US EPA are higher than the CTR criteria for the organochlorine pesticides. The Basin Plan must be amended consistent with applicable federal and state laws and regulations to revise, add or delete any water quality objective.

Organophosphates: The organophosphorus (OP) pesticides diazinon and chlorpyrifos have been documented at toxic levels in numerous surface water bodies and these water bodies have been listed on the Clean Water Act section 303(d) list of impaired water bodies.

To address the OP pesticide problem, the Basin Plan has been amended to establish water quality objectives and implementation programs for diazinon and chlorpyrifos in the Sacramento, Feather and San Joaquin Rivers and the Delta. Federal requirements to develop TMDL allocations are also addressed in this process. Staff is currently working on a Basin Plan Amendment to establish water quality objectives for diazinon and chlorpyrifos in many other water bodies within the Region.

Other Pesticides: In addressing the diazinon and chlorpyrifos issues, significant concerns have been raised regarding the impacts of replacement

products, such as pyrethroids. Staff anticipates working in the future on pesticide Basin Plan Amendments that would address pyrethroid pesticides and other pesticides that pose a high risk to surface waters in the Sacramento and San Joaquin River Basins. For water bodies that are impaired for these pesticides, water quality objectives and implementation programs would be developed. The Amendments would include TMDL allocations, where appropriate. It is anticipated that adopting numeric objectives for these pesticides will facilitate implementation of provisions of the Irrigated Lands Waiver, since well defined pesticide objectives and compliance time schedules will be established.

Public workshops and hearings will be held as part of the Basin Planning process to address OC, diazinon, chlorpyrifos and other pesticides. The public hearings will provide the review process that was established in the Basin Plan for addressing problem pesticides.

Priority: High

Current Action: Organochlorines: Staff started working on a Basin Plan Amendment to control OC pesticides in 21 impaired reaches of water bodies within the Central Valley. However, this activity is now on hold pending resource allocations.

Organophosphates: Staff is currently working on a Basin Plan Amendment addressing diazinon and chlorpyrifos in nearly 1,000 water bodies in the Sacramento and San Joaquin River Basins. This Basin plan Amendment will include numeric water quality objectives and a program and implementation, and also TMDL allocations for impaired water bodies.

Other Pesticides: Staff anticipates working on future Basin Plan Amendments to address other pesticides. Most pesticides lack sufficient data to use the 1985 US Environmental Protection Agency methodology to calculate criteria, which could be used for development of water quality

objectives. Central Valley Water Board staff provided contract funds for the University of California, Davis to develop an alternative methodology for deriving water quality criteria for pesticides. The methodology was finalized in 2009. UC Davis recently produced technical reports where this methodology was utilized for several pesticides, including a few pyrethroids. Staff will consider using this information, along with other available methodologies, in the development of future pesticide Basin Plan Amendments to address pesticides that pose a high risk to surface waters in the Sacramento and San Joaquin River Basins.

Current Resources:

- 1) Staff – TMDL resources.
- 2) Contract(s) -- about \$100,000 in current year funds has been provided from state-wide TMDL resources to aid in pesticide criteria development.

Additional Action:

Monitoring to establish the sources for impacted waters in the remaining Sacramento and San Joaquin River watersheds and development of control programs that include water quality objectives and, where applicable, TMDL allocations for these water bodies.

Continue work on the control program for OC pesticides. Re-evaluate the Basin Plan water quality objectives for OC pesticides.

Additional Resource Requirements:

- 1) Staff -- 1.0 PY per year for three years to complete the control program for OC pesticides. 0.5 PY per year for three years to re-evaluate the water quality objectives for OC pesticides.
- 2) Contract(s) -- \$200,000 per year to conduct source monitoring for pesticide impaired water bodies.

Issue 8: Mercury Load Reduction Program

Discussion: Elevated mercury levels can be expected in areas where mercury was mined (Coast Range), where mercury was used to extract gold (Sierra Nevada and Cascade Range), and in downstream water bodies. Mercury is a problem because it accumulates in aquatic organisms to levels that pose a threat to predator species and people that eat fish. Because of elevated mercury levels in fish tissue, numerous water bodies, including the Delta, its tributaries, and numerous reservoirs and streams have been included on the Clean Water Act Section 303(d) list of impaired water bodies. The Clean Water Act mandates that the Regional Water Board develop load reduction programs to resolve these water quality problems through a Total Maximum Daily Load (TMDL) allocation process. Health advisories have been issued for the Delta, the Lower American River, Lake Natoma, and other water bodies in the Central Valley due to the mercury levels in fish. Recent studies may result in health advisories being issued for additional water bodies as well as more water bodies being added to the Clean Water Act 303(d) list for mercury impairments.

The Regional Water Board adopted Basin Plan Amendments that include fish tissue objectives, implementation programs, and TMDL allocations for controlling mercury and methylmercury in Clear Lake, Cache Creek and its tributaries, and the Delta.

Priority: High

Current Action: Adopted mercury control programs need to be implemented while new control programs need to be adopted. While total mercury is expected to be controlled when contaminated sediment is controlled, control technology and management practices for methylmercury are not known. For the adopted control programs, staff will work with stakeholders to design and implement work plans to identify feasible control measures. This information will be useful for the development of

future control programs as well as the implementation of existing control programs. Staff is working on new control programs for other water bodies in the Central Valley including the American River watershed. Also, staff from multiple water boards are working together on control program to address mercury impairments on a statewide perspective. See Issue No. 12 (State Water Board Plans and Policies and other Statewide Issues) for more information.

Current Resources:

- 1) Staff -- Funding from the TMDL program and the nonpoint source program.
- 2) Contract(s) -- \$30,000 per year from the TMDL program

Additional Action:

Initiate source monitoring and develop methylmercury and mercury TMDL control programs for the Delta tributaries, reservoirs, and upstream watersheds. Work with stakeholders in water bodies other than the Delta to develop, evaluate, and implement methylmercury control measures for land and/or water management activities that cause or contribute to the methylmercury impairment.

Additional Resource Requirements:

- 1) Staff -- 2 PYs per year
- 2) Contract(s) -- \$100,000 per year

Issue 9: Policies for Maintaining Water Quality for Drinking Water

Discussion:

The Sacramento/San Joaquin Delta is the source of drinking water for two thirds of the state's population (over 25 million people). In addition, the Sacramento and San Joaquin Rivers, the two principal rivers discharging to the Delta, and their tributaries, are sources of drinking water for many Central Valley communities. The Sacramento and San Joaquin Rivers receive pollutants from various activities in the Central Valley including agriculture, mining, confined animal facilities, and urban runoff and municipal and domestic wastewater. These pollutants include pesticides, trace elements, metals, nutrients, and pathogens. Other drinking water constituents of concern are the precursors to disinfection by-products (organic carbon and bromide). The Delta and segments of the Sacramento and the San Joaquin Rivers are listed in the Clean Water Act Section 303(d) list due to impairment of beneficial uses by many of these pollutants. Increased development and population growth along with more intense land use will increase demand for high quality drinking water as well as increase pollutant loads into the State's water supplies.

The Basin Plan assigns the municipal and domestic water supply (MUN) beneficial use to all surface waters with a few limited exceptions. Maximum contaminant levels (MCLs) to protect drinking water supplies are contained in Title 22 of the California Code of Regulations and have been incorporated by reference into the Basin Plan for the protection of waters designated MUN. There are MCLs for some of the drinking water constituents of concern such as arsenic, salinity, nitrates, some pesticides, volatile organics, disinfection byproducts (trihalomethanes) and radiological constituents. However, there are no MCLs for other drinking water constituents of concern such as precursors to disinfection by-products (organic carbon and bromide) and pathogens (*Cryptosporidium* and *Giardia*).

In response to directives in the 1996 Reauthorization of the federal Safe Drinking Water Act, the USEPA has been developing more stringent regulations with respect to controlling and reducing levels of disinfection by-products (DBPs) and pathogens. High levels of organic carbon in source waters make control of trihalomethanes and haloacetic acid compounds difficult if chlorine is the disinfectant, and high levels of bromide in source waters make control of bromate difficult if ozone is the disinfectant. The recent rules requiring reductions in DBPs and increased removal of pathogens are particularly challenging for water systems with source waters high in organic carbon, bromide and pathogen levels.

The Sacramento River generally has low concentrations of organic carbon (generally around 2 mg/L) and the San Joaquin River has higher concentrations (generally around 3.8 mg/L).⁶ Drinking water purveyors must conduct additional actions when total organic carbon concentrations reach 4 mg/L⁷ and drinking water intakes in the Delta have almost reached this level with the Barker Slough intake already exceeding this level.⁸ In addition to the two major rivers, Delta agricultural drainage, wetlands, and the smaller rivers that flow into the Delta are sources of organic carbon. As urban areas develop within the watersheds tributary to the Delta, there is concern that urban runoff and wastewater will contribute organic carbon to Delta waters. The tidal exchange between the Delta and San Francisco Bay brings bromide into the Delta. Median Delta bromide concentrations are more than 6 times the national median. The combination of organic carbon and bromide make

⁶ Archibald Consulting, California State Water Project Watershed Sanitary Survey, 2006 Update, June 2007, Page 3-22. Report found at: http://www.water.ca.gov/waterquality/drinkingwater/docs/program_reports/calif_state_water_project_watershed_sanitary_survey_2006_update.pdf

⁷ USEPA, Fact Sheet on the Federal Register Notice for Stage 1 Disinfectants and Disinfection Byproducts Rule, EPA 815-F-98-010, December 1998. Fact sheet found at: <http://water.epa.gov/lawsregs/rulesregs/sdwa/stage1/factsheet.cfm>

⁸ Archibald. 2007. Pages 3-26 to 3-29.

it difficult and expensive for Delta water purveyors to meet the current and anticipated regulations. Drinking water purveyors are also concerned over taste and odor problems from algae associated with high nutrient levels. There are also concerns over the presence of algal species that are known to produce algal toxins.

In addition to pathogens and DBP precursors, concerns have also been expressed with salinity and nutrients. Stakeholders have been coordinating with the CV-SALTS efforts to develop a regionwide salt management policy that will also address drinking water concerns. See Issue No. 1 for more details regarding development of a salt management policy. Stakeholders are also coordinating with the State Water Board's effort to develop nutrient numeric endpoints to ensure that drinking water concerns are addressed in that effort. See Issue No. 12 for a list of State Water Board planning efforts under development.

The promulgation of drinking water regulations raises concerns regarding drinking water constituents of concern not previously regulated by the Central Valley Water Board. The CALFED Record of Decision (ROD) identified the need for a comprehensive source water protection program and a comprehensive drinking water policy for the Delta and upstream tributaries. The Central Valley Water Board signed a MOU committing to working with the Department of Health Services (DHS) (now the Department of Public Health (DPH)), the State Water Board and USEPA to develop and adopt a policy to protect sources of drinking water for the Delta and its tributaries. The Central Valley Water Board committed to developing a comprehensive drinking water policy in Resolution No. R5-2004-0091 and reiterated its commitment for a policy in Resolution No. R5-2010-0079. In the 2010 resolution, the Central Valley Water Board directed staff to bring a final drinking water policy to the Board in three years.

Priority:

High

Current Action: A Central Valley Drinking Water Policy Workgroup (Workgroup) made up of federal and state agencies, drinking water purveyors, and wastewater, municipal and agricultural dischargers was formed to help staff develop the comprehensive drinking water policy.

Current Resources: Stakeholders have funded staff to develop a drinking water policy. CUWA received a grant on behalf of the Workgroup for almost a million dollars to fund technical studies that will help with development of the policy.

Additional Action: As the studies conclude, it may become evident that more studies are necessary to evaluate the impact of the drinking water constituents of concern on all the beneficial uses and to develop appropriate criteria to protect all the beneficial uses.

Additional Resource Requirements:

- 1) Staff -- While stakeholders have funded 0.5 PYs per year since 2003, performance is evaluated every year prior to agreement to extend funding another year. Therefore, the staff resources are included under Additional Resource Requirements since future funding is not assured at this time. A minimum of 0.5 PYs staff funding is needed every year to work with stakeholders to develop any basin plan amendments.
- 2) Contract(s) -- Additional studies are estimated to require \$1,000,000.

Issue 10:

Protection of Central Valley Fisheries and other Aquatic Life

The Basin Plan identifies water bodies that require aquatic life protection by designating the following beneficial uses: warm freshwater habitat (WARM), cold freshwater habitat (COLD), fish migration (MIGR) and fish spawning (SPWN). Stakeholders have indicated that water quality objectives for dissolved oxygen and temperature may need to be re-evaluated to provide appropriate protection of the aquatic life beneficial uses.

Dissolved Oxygen: The basin plan includes (1) general dissolved oxygen objectives that apply to all water bodies designated as supporting WARM, COLD and SPWN and (2) site specific objectives for certain water bodies that are typically higher than the general objectives. Both general and site-specific objectives are applied as minimum levels that are to be equaled or exceeded at all times. These objectives have existed in the Basin Plan since its original adoption in 1975. In 1986, the USEPA developed National Criteria for dissolved oxygen. The National Criteria have not been evaluated for use in the Sacramento River and San Joaquin River Basins.

A concern is that the specific dissolved oxygen objectives for the Delta contain ambiguous language regarding applicable water quality objectives for “bodies of water which are constructed for special purposes and from which fish have been excluded or where the fishery is not important as a beneficial use.” There is an unresolved disapproval from the US Environmental Protection Agency on the editing of the language that created this ambiguity.

Commenters have requested that site specific dissolved oxygen objectives be developed for the Stanislaus River because the current dissolved oxygen water quality objectives do not provide adequate protection of the fisheries present in the River.

Temperature: In previous Triennial Reviews, the Department of Fish and Game, Region 1, requested that temperature objectives be established to protect spring-run Chinook salmon and steelhead in the Sacramento River Basin. In the current Triennial Review, the Department of Fish and Game, Region 4, requested temperature objectives be established to protect fall-run Chinook salmon in the San Joaquin River Basin. USEPA Region 10, which has jurisdiction over the Northwestern United States, issued regional guidance for developing numeric temperature standards for the Pacific Northwest to protect cold water (salmonid) beneficial uses. While USEPA Region 9, which has jurisdiction over California, has not adopted similar guidance, it is supportive of the scientific approach used in the EPA Region 10 guidance for development of numeric temperature standards to protect salmonid beneficial uses in the Central Valley. The Department of Fish and Game is also supportive of the use of the USEPA Region 10 guidance to develop numeric temperature objectives.

In August 2005, NOAA Fisheries designated critical habitat for 19 Evolutionarily Significant Units (ESUs) of salmon and steelhead in the Northwest and California. The ESUs within the Central Valley are the Central Valley Spring Run Chinook Salmon and the Central Valley Steelhead. The ESU range for the Chinook salmon is the Sacramento River and the ESU range for the steelhead is the Sacramento River and the San Joaquin River and their tributaries. Essential features of critical habitat include adequate: (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions.

Long Water Body Reaches: Commenters on the current Triennial Review also point out that some of the Basin Plan's named water bodies are very long and have different characteristics from one end of the reach to the other end. In many of

these cases, these long water body reaches are designated both WARM and COLD, and thus protection of aquatic life is based on the COLD criteria, which is believed to be more stringent. However, this may not be adequately protective of either the warm or cold water ecosystems that are present. Suggestions include subdividing these reaches to appropriate sizes and designating appropriate beneficial uses for each subreach, or developing water quality objectives that take into consideration the species that may be present at any particular place or time and, thus, provide seasonality to the water quality objectives.

Beneficial Uses: Commenters have stated that there is technical information that indicates that WARM and/or COLD might be inappropriately designated for specific water bodies. These water bodies have been included under Issue No. 4 (Beneficial Use Designations) and are not included in the below work plan estimates.

Priority: High

Current Action: None

Current Resources: None

Additional Action: There are a number of actions that staff may take to address this issue. One possible action would be to re-evaluate the general and site-specific water quality objectives for dissolved oxygen.

Another action would be to work with the fishery agencies and other stakeholders to develop water quality objectives, which may be narrative or numeric, for dissolved oxygen and temperature to protect the salmonid beneficial uses.

Yet another action could be to work with stakeholders on appropriately subdividing long water body reaches and developing water quality objectives that provide optimum protection of the aquatic life that is present in each reach. In these cases, it may be useful to design and conduct a

site-specific evaluation that would then serve as a template for other evaluations.

Additional Resource
Requirements:

- 1) Staff -- 0.5 PYs per year per amendment.
- 2) Contract(s) -- \$500,000 for work on temperature objectives, \$200,000 for work on reaches.

Issue 11: Secondary MCLs as Water Quality Objectives for Surface and Ground Waters

Discussion:

Secondary MCLs are used as water quality objectives to protect the municipal and domestic supply (MUN) use from impairment. The Central Valley Water Board determines compliance with these water quality objectives using total recoverable analysis of unfiltered water samples, not as dissolved. The rationale for the use of total recoverable analysis rather than dissolved is that MUN includes small domestic water supply systems that may not be required to filter and so may not be filtering ambient water prior to delivery to customers.

Commenters in the last two triennial reviews have recommended that the Central Valley Water Board re-evaluate the use of Secondary Maximum Contaminant Levels (MCLs) as water quality objectives. Commenters were particularly concerned with iron, manganese and TDS. Commenters believe that use of Secondary MCLs should be re-evaluated because Secondary MCLs are based on consumer acceptance levels and are therefore unrelated to human health and welfare or the protection of aquatic life. Also, secondary MCLs are applied at the tap, not to the drinking water source (or in this case ambient water). Commenters recommend the removal of the incorporation by reference for secondary maximum contaminant levels, or, at the very least, secondary MCLs should be applied as a dissolved standard instead of a total standard.

While secondary MCLs are standards that apply to contaminants that may adversely affect the odor or appearance of water, these constituents may have other effects at higher concentrations including to beneficial uses other than MUN. In order to address these constituents in accordance with applicable federal and state laws and regulations, their potential effects on human health as well as on other beneficial uses would need to be evaluated.

Priority: High

Current Action: None

Current Resources: None

Additional Action: The Central Valley Water Board should work with stakeholders to develop a regulatory approach to provide appropriate protection of beneficial uses for these pollutants of concern. Due to the range of types of the constituents, there may be a number of different approaches. All approaches need to be consistent with applicable federal and state laws and regulations.

Additional Resource
Requirements:

- 1) Staff – 0.5 PYs per year
- 2) Contract(s) -- \$100,000 to \$200,000 per constituent.

Issue 12: Participation in State Water Board Plans and Policies and other Statewide Issues

Discussion:

The State Water Board may develop plans and policies which, when adopted, supersede any regional water quality control plans for the same waters to the extent of any conflict (CWC §13170).

The State Water Board staff is currently working on the following plans and policies which are relevant to the Central Valley Region:

- Anti-degradation policy
- Aquifer storage and recovery policy
- Bacterial objectives for inland surface waters
- Bay-Delta Plan
- Bio-indicators or Biological Objectives
- Cadmium objective and implementation policy
- Chlorine residual objectives and implementation policy
- Mercury offset policy
- Methymercury objectives
- Nutrient numeric endpoints tools
- Onsite waste water treatment regulations/waiver
- Sediment Quality Objectives for Enclosed Bays and Estuaries
- Toxicity control provisions for the SIP
- Trash policy
- Wetlands and riparian areas policy

The Central Valley Water Board staff participates in the development of these plans and policies to make sure the Central Valley regional priorities are considered. The most relevant program generally provides staff to participate in policy development. So, for example, the Water Quality Certification Program takes the lead in communicating with State Water Board staff developing the Wetlands and Riparian Areas Policy. However, for many of the policies, the most closely related program is basin planning. Therefore, some of the Region's basin planning resources must be spent in participating in the development of the State Water Board's Plans and Policies. In all cases, once the

State Water Board's Plans and Policies become effective, the Central Valley's Basin Plans should be updated to provide the most updated information to stakeholders.

Recently, staff from multiple Water Boards is exploring working together on projects that are of mutual interest. The initial planning projects are development of a statewide implementation program to address methyl mercury impairments in reservoirs; and development of strategies for addressing naturally high levels of constituents.

Priority:

High

Current Action:

Basin planning resources are used to track development of the anti-degradation Policy, bacterial objectives for inland surface waters, nutrient numeric endpoints tools, and the toxicity control provisions for the SIP.

The core regulatory programs (NPDES and land discharge programs) track development of the policies on aquifer storage and recovery, cadmium, chlorine residual, and onsite waste water treatment regulations. The Water Quality Certification program is tracking development of the wetlands and riparian areas policy. And the TMDL program is tracking work on the Bay-Delta Plan, development of the mercury offset policy, methylmercury objectives, sediment quality objectives and the trash policy. Staff working on CV-SALTS is also coordinating with State Water Board staff working on the Bay-Delta Plan. Land Discharge Program Staff is also taking the lead in developing statewide General Waste Discharge Requirements for Aquifer Storage and Recovery projects.

Current Resources:

Basin planning provides 0.2 PYs per year to track the development of the policies that are most closely related to the basin planning program.

Additional Action:

The State Water Board's policy for onsite sewage treatment systems is expected to be generic to reflect the need to apply the policy everywhere in

the State. Due to some of the known conditions in the Central Valley, it may be necessary for the Central Valley Water Board to adopt supplemental provisions to provide appropriate protection of beneficial uses in the Central Valley.

Additional Resource
Requirements:

- 1) Staff – 0.5 PYs per year
- 2) Contract(s) -- \$0 to \$100,000 depending on the areas that need to be amended.

Issue 13:

Current USEPA Criteria

Discussion:

The Central Valley Regional Board is currently implementing criteria promulgated by USEPA in 2000. These criteria are known as the California Toxics Rule (CTR) and include the toxic pollutants which are also called priority pollutants. Since the promulgation of the CTR, USEPA has published updated guidance for 98 pollutants, pursuant to Section 304(a) of the Clean Water Act. The updated guidance represents the most current science and may provide better criteria to protect beneficial uses. For example, USEPA recently provided guidance for pentachlorophenol criteria to protect early life stage salmonids in situations of low DO and high temperatures.

USEPA also publishes guidance for non-priority pollutants. These pollutants were not included in the EPA promulgation of the CTR. Ammonia is an example of a non-priority pollutant. The Basin Plan includes narrative objectives and a *Policy for Application of Water Quality Objectives* that indicates that the Central Valley Water Board can use available information and numerical criteria and guidelines from other authoritative bodies to assist in determining compliance with narrative objectives. Therefore, staff can use the USEPA National Recommended Water Quality Criteria to derive permit limits. However, non-uniform translation of narrative water quality objectives could be impairing the Central Valley Water Board's ability to properly protect the beneficial uses of its waters.

Priority:

Low

Current Action:

None

Current Resources:

None

Additional Action:

Review current National Recommended Water Quality Criteria and other recent scientific information on pollutants to determine whether amendments are needed to the water quality

objectives to ensure that beneficial uses are protected.

Additional Resource
Requirements:

- 1) Staff -- About 0.5 PYs per year for two years. Additional resources would be needed to conduct basin plan amendments if determined to be necessary.
- 2) Contract(s) -- \$0

Issue 14: Groundwater Survey and Control Policies for Discharges to Groundwater

Discussion:

The Basin Plan describes various ground water quality problems that exist throughout the region and includes numerous policies that address prevention and cleanup of groundwater quality problems.

The 2003 update of the Department of Water Resources Bulletin 118 includes a summary of water quality from public supply water wells sampled from 1994 to 2000. In the Sacramento River Basin, 74 of 1356 wells had constituents that exceed one or more of the state's maximum contaminant levels (MCLs) for drinking water. The most frequently exceeded constituents were nitrates, volatile/semi-volatile organic compounds and inorganic chemicals. In addition, the Bulletin also notes that groundwater quality is generally excellent but there are areas with local groundwater problems such as natural water quality impairments at the north end of the Sacramento Valley and along the margins of the valley and around the Sutter Buttes, where Cretaceous-age marine sedimentary rocks containing brackish to saline water are near the surface. Human-induced impairments in this area are generally associated with individual septic system development in shallow unconfined portions of aquifers or in fractured hard rock areas where insufficient soil depths are available to properly leach effluent before it reaches the local groundwater supply.

In the San Joaquin River Basin, 126 of 689 wells had constituents that exceeded one or more MCLs. The most frequently exceeded constituents were pesticides, radiological contaminants and nitrates. In general, groundwater quality throughout the basin is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are TDS, nitrate, boron, chloride, and organic compounds. Most of the TDS is naturally occurring. High TDS content in the trough of the

valley is the result of concentrations of salts due to evaporation and poor drainage. Nitrates may occur naturally or as a result of disposal of human and animal waste products and fertilizer. Boron and chloride are likely a result of concentration from evaporation near the valley trough. Organic contaminants can be broken into two categories, agricultural and industrial. Agricultural pesticides and herbicides have been detected in groundwater throughout the region, but primarily along the east side of the San Joaquin Valley where soil permeability is higher and depth to groundwater is shallower. Industrial organic contaminants include TCE, dichloroethylene (DCE), and other solvents. They are found in groundwater near airports, industrial areas, and landfills. PCE and other dry cleaning chemicals are found in groundwaters beneath many cities.

The Supplemental Report of the 1999 Budget Act and later the Groundwater Quality Monitoring Act of 2001 required the State Water Board to develop a comprehensive ambient groundwater monitoring plan. To meet this mandate, the State Water Board created the Groundwater Ambient Monitoring and Assessment (GAMA) Program. The primary objective of the GAMA Program is to comprehensively assess statewide groundwater quality and gain an understanding about contamination risk to specific groundwater resources. The GAMA Program initiated a number of ground water assessment projects. One of the projects, the Voluntary Domestic Well Assessment Project, samples domestic wells county by county. While there are no drinking water standards for domestic wells, the studies compare water quality of the wells to the MCLs. Studies have been completed for El Dorado, Tehama and Yuba Counties. In El Dorado County, it was found that 30% of the sampled wells would not pass state primary MCLs. In Tehama County, 25% of the sampled wells had constituent levels above the primary MCLs. In Yuba County, 24% of the sampled wells had constituent levels above the primary MCLs.

In 2008, the Central Valley Water Board adopted Resolution No. R5-2008-0181 supporting the development of a groundwater strategy for the Central Valley Region. In September 2010, the Central Valley Water Board approved the Groundwater Quality Protection Strategy or "Roadmap" with Resolution No. R5-2010-0095. The Roadmap identifies current and future actions to protect groundwater quality, abate degradation, and improve and restore water quality in Central Valley groundwater. Almost all identified current and future actions can be implemented through the existing programmatic structure of the Central Valley Water Board and through improved partnerships with other agencies or organizations. The only basin planning actions identified in the Roadmap are the CV-SALTS efforts and the policy for onsite waste water treatment facilities as basin planning priorities. Since these efforts are included in Issue No. 1 (Salt and Nitrate Management) and Issue No. 12 (Participation in State Water Board Plans and Policies), no basin planning actions are identified as part of this issue.

Priority: None

Current Action: No action required.

Table: Priority and Resources

Issue #	Priority	Title	Current PYs/Yr	Current Contract Resources	Add'l PYs/Yr	Additional Contract Resources
1	High	Salt & Nitrate Management	2.1	Cleanup/Abatement Acct	0.8+	\$22-\$42 million
2	High	Water Bodies Dominated by NPDES Discharges	0	0	0.5	\$200,000
3	High	Agricultural Dominated Water Bodies & Conveyances	0	0	1	\$500,000
4	High	Beneficial Use Designations	<1	Stakeholder funded	1	\$500,000
5	High	Delta Issues	3.5	Cleanup/Abatement Acct	TBD	TBD
6	High	Dissolved Oxygen Problems in San Joaquin River	1	0	0	\$0
7	High	Pesticide Control Efforts	3	\$100,000	1.5	\$200,000
8	High	Mercury Load Reduction Program	4.5	\$30,000	2	\$100,000
9	High	Maintaining Water Quality for Drinking Water	0.5	Stakeholder funded	TBD	\$1,000,000
10	High	Protection of Central Valley Fisheries & other Aquatic Life	0	0	0.5	\$500,000
11	High	Secondary MCLs	0	0	0.5	\$100,000 to \$200,000
12	High	Participation in SB Plans and Policies	0.2+	0	0.5	\$100,000
13	Low	Current USEPA Criteria	0	0	0.5	\$0
14		Groundwater Survey and Control Policies	0	0	0	\$0