# ATTACHMENT 1

March 6, 2017

***Via Electronic Mail Only***

Ms. Denise Soria
Regional Water Quality Control Board,
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670
denise.soria@waterboards.ca.gov

RE: Comments on the Tentative Waste Discharge Requirements for City of Delano, Wastewater Treatment Facility, Kern County

Dear Ms. Soria:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to comment on the tentative Waste Discharge Requirements for the City of Delano, Wastewater Treatment Facility (Tentative Order). CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law. In this letter, we provide the following comments regarding the effluent limitation for total nitrogen.

Provision C.1.a of the Tentative Order proposes an effluent limitation of 10 mg/L for total nitrogen as a monthly average. Setting an effluent limitation for total nitrogen is inappropriate for several reasons. First, there is no water quality objective for total nitrogen. There is a primary maximum contaminant level (MCL) for nitrate, but not for total nitrogen. For this reason, the proposed limit is not consistent with any adopted water quality objective or known criteria.

Second, total nitrogen is also different and distinguishable from nitrate, and setting an effluent limit for total nitrogen will not necessarily translate to obtaining the target nitrate levels. Accordingly, a substantial justification is needed to impose an effluent limitation for nitrogen rather than nitrate. There are no findings in the Tentative Order that provide any reasoning or explanation as to why a total nitrogen effluent limit will result in maintaining groundwater quality at the Primary MCL of 10 mg/L for nitrate. At most, the Regional Board could determine that an effluent limitation for nitrate is appropriate to protect groundwater quality and similarly set the effluent limit at 10 mg/L for nitrate. Alternatively, the Regional Board could set an effluent limit for nitrate plus nitrite. CVCWA requests that the effluent limitation for total nitrogen be removed from the Tentative Order.

We appreciate your consideration of these comments. If you have any questions or if CVCWA can be of further assistance, please contact me at (530) 268-1338 or eofficer@cvcwa.org.

Sincerely,

Debbie Webster

Debbie Webster,
Executive Officer

cc (*via email*): Pamela Creedon, Central Valley Regional Water Quality Control Board (pamela.creedon@waterboards.ca.gov)

# ATTACHMENT 2

CENTRAL VALLEY CLEAN WATER ASSOCIATION
CVCWA
EST. 1987

# Central Valley Clean Water Association

*Representing Over Fifty Wastewater Agencies*

**TERRIE MITCHELL – Chair, Sacramento Regional CSD** **CASEY WICHERT – Vice Chair, City of Brentwood**
**TERESA TANAKA – Secretary, Calaveras County WD** **ROBERT GRANBERG – Treasurer, City of Stockton**

February 21, 2017

***Via Electronic Mail Only***

Mr. Glenn Meeks
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670
Glenn.Meeks@waterboards.ca.gov

RE: Comment Letter – Salt and Nitrate Management Plan (SNMP) for the Central Valley

Dear Mr. Meeks:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to provide these comments in response to the Salt and Nitrate Management Plan for the Central Valley (SNMP). CVCWA represents over 50 publicly-owned treatment works (POTWs) that provide wastewater collection, treatment, and disposal for over seven million people in the Central Valley. CVCWA's mission is to represent the interests of wastewater agencies in the Central Valley in regulatory matters that balance the need for environmental protection based on sound scientific information with a fair and reasonable economic basis. CVCWA is an active participant in the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS), and has reviewed and commented on draft versions of the Salt and Nitrate Management Plan (SNMP) and its various components as they have been developed. As an active participant in CV-SALTS, CVCWA has a significant interest in the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) actions to accept the SNMP, and to take steps to initiate basin planning actions to develop and incorporate amendments into the Water Quality Control Plans for the Central Valley, would implement the SNMP.

In summary, CVCWA supports adoption of *Draft Resolution R5-2017-XXXX Accepting the Salt and Nitrate Management Plan for the Central Valley Region Developed Under the CV-SALTS Initiative and Directing Staff to Initiate Basin Plan Amendments as Appropriate to Implement the Plan* (Draft Resolution). Overall, the SNMP represents a fair balance for managing nitrates and salts within the Central Valley as it reflects the interests of many diverse stakeholders, and its proposed policies reflect significant compromises made by many stakeholders. However, as has been stated many times throughout the development of the SNMP, CVCWA believes strongly that implementation of the SNMP, and in particular the Salinity Management Strategy, must be borne by many in California, including those that rely on water resources that emanate from the Central Valley. Salt problems within the Central Valley are complex, and are not caused solely (or even significantly) by discharges of salinity from those that reside in the Central Valley.

With respect to the individual proposed strategies and policies (See Finding 22 of the Draft Resolution), CVCWA supports the flexible, additional authorities that adoption of these policies would provide to the Central Valley Water Board. Notably, adoption of the strategies and policies into the Water Quality Control Plans does not automatically authorize discharges in such a manner as would be allowed by the strategies and/or policies. But, adoption of these strategies/policies would provide the Central Valley Water Board with authority to consider such options on a case-by-case basis.

Also, as the Central Valley Water Board directs its staff to initiate amendments to the Water Quality Control Plans, CVCWA encourages the Central Valley Water Board to understand (and direct its staff accordingly) to include the three management goals and associated strategies and policies as a collective foundation for such amendments. Selecting only some, or portions, of the SNMP goals, strategies, and policies will inevitably upset the balance that was otherwise reached through development of the SNMP and its component parts.

Finally, CVCWA reserves its right to comment throughout the public process that is employed for development of amendments to the Water Quality Control Plans. We will continue to be an active participant, and look forward to working with your staff and other stakeholders as we move towards implementing the next steps in this process.

We appreciate your consideration of these comments. If you have any questions or if CVCWA can be of further assistance, please contact me at (530) 268-1338 or eofficer@cvcwa.org.

Sincerely,

Debbie Webster

Debbie Webster,
Executive Officer

# ATTACHMENT 3

Central Valley Clean Water Association
Representing Over Fifty Wastewater Agencies



February 24, 2017

Glenn Meeks, Senior Engineering Geologist
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

***Delivered via email only to:*** Glenn.Meeks@waterboards.ca.gov

SUBJECT: Proposed Amendment to the Water Quality Control Plan for the Tulare Lake Basin to Remove the Municipal and Domestic Supply (MUN) and Agricultural Supply (AGR) Beneficial Uses within a Designated Horizontal and Vertical Portion of the Tulare Lake Bed

Dear Mr. Meeks:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to comment on the proposed amendment to the Water Quality Control Plan for the Tulare Lake Basin to remove the Municipal and Domestic Supply (MUN) and Agricultural Supply (AGR) beneficial uses from groundwater within horizontally and vertically delineated areas underlying a portion of the historical Tulare Lake Bed. CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law.

In general, we support the larger effort by the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) to review existing Basin Plan beneficial use designations to determine whether such designations are appropriate and whether implementation programs provide an appropriate level of protection for the waterbodies that support these beneficial uses. With respect to the proposed Basin Plan Amendment, CVCWA supports the de-designation of MUN and AGR beneficial uses in groundwater in a portion of the historical Tulare Lake Bed where technical analyses showed that existing water quality does not support these uses, and communication with municipal, domestic, and agricultural water users within and proximate to the proposed beneficial use de-designation area revealed that groundwater within the de-designation area is not currently used, nor anticipated to be used in the future for MUN and AGR beneficial uses.

Thank you for the opportunity to provide comments.

Sincerely,

Debbie Webster,
Executive Officer

# ATTACHMENT 4

March 15, 2017

***Via Electronic Mail Only***
Xuan Luo
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite #200
Rancho Cordova, CA 95670
Xuan.luo@waterboards.ca.gov

RE: Evaluation of Ammonia Water Quality Objectives for the Protection of Aquatic Life in the Central Valley

Dear Ms. Luo:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to comment on the Notice of California Environmental Quality Act Scoping for Evaluation of Ammonia Water Quality Criteria for the Protection of Aquatic Life in the Central Valley (Ammonia CEQA Scoping). CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law. In this letter, we provide brief comments regarding the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) proposed project to consider whether numeric water quality objectives for ammonia should be adopted into the Board's Water Quality Control Plans.

As a preliminary matter, the issue of ammonia is a significant one to all Central Valley POTWs, and in particular those that discharge to surface waters under terms prescribed in a National Pollutant Discharge Elimination System Permit. CVCWA has played an instrumental role in working with its members, and other POTWs, in assessing impacts to aquatic life from ammonia. This includes administering a Special Project to conduct studies with respect to the application of the latest U.S. EPA criteria for mussels issued in 2013. Accordingly, CVCWA respectfully requests that the Central Valley Water Board establish a stakeholder process for the development of amendments to Water Quality Control Plans for ammonia, and that CVCWA be a key member in that stakeholder process.

Second, as the Central Valley Water Board staff considers various options, CVCWA recommends that water quality objectives for the following scenarios be part of further discussion and deliberation:

- No Mussels Present
- All Species
- Only Species Present
- Attenuation in the receiving water
- Lack of receiving water conditions for colonization of mussels regardless of the designated beneficial use

Further, any surveillance and monitoring program with respect to ammonia should allow dischargers the option to use environmental DNA to determine compliance with any future adopted water quality objective.

Thank you for this opportunity to comment. CVCWA looks forward to working with Central Valley Water Board staff as they move forward with this very important project. Please contact me at (530) 268-1338 or eofficer@cvcwa.org with any questions.

Sincerely,

Debbie Webster

Debbie Webster,
Executive Officer

cc: Adam Laputz

# ATTACHMENT 5

Central Valley Clean Water Association

Representing Over Fifty Wastewater Agencies

TERRIE MITCHELL – Chair, Sacramento Regional CSD
CASEY WICHERT – Vice Chair, City of Brentwood
TERESA TANAKA – Secretary, Calaveras County WD
ROBERT GRANBERG – Treasurer, City of Stockton

February 17, 2017

Felicia Marcus, Chair
Members of the State Water Resources Control Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814
commentletters@waterboards.ca.gov

**SUBJECT: Comments on *Proposed Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bay and Estuaries of California – Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions***

Dear Chair Marcus and Members of the Board:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to provide written comments on the proposed revisions to the proposed *Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California – Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions* (Proposed Beneficial Uses and Mercury Provisions). CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law. This letter is submitted in conjunction with three other representatives of publicly owned treatment works (POTWs): the California Association of Sanitation Agencies (CASA), the Southern California Alliance of POTWs (SCAP), and the Bay Area Clean Water Agencies (BACWA). CASA represents over 100 public wastewater agencies located throughout the state of California. SCAP represents over 80 wastewater treatment and collection system agencies located in the seven southern California counties. BACWA is a joint powers agency comprised of local clean water agencies that provide sanitary sewer services to the more than seven million people living in the nine-county San Francisco Bay Area.

We sincerely appreciate the time that individual State Water Resources Control Board (State Water Board) members and staff have taken over the last month to work with us on these issues. We believe that these collaborative discussions should broaden to include tribal and subsistence fishing representatives as a means to arrive at a sustainable and productive approach to implementation of the three proposed beneficial uses in the Central Valley and throughout California.

As we have stated in our meetings to date, CVCWA is supportive of the three new proposed beneficial uses. We agree with tribal and subsistence fishing representatives that these uses have long existed and should be formally recognized as part of our water quality control planning process under the Clean Water Act and California Water Code. CVCWA does have some remaining concerns about the manner in which these beneficial uses have been proposed. Our primary questions pertain to the definitions used and the process and principles to be used by Regional Boards in the designation and implementation of those uses and associated water quality objectives. We have included some ideas for your consideration on this topic in this letter. As we have discussed, CVCWA and other POTW representatives look forward to working collaboratively with Regional Boards, tribal representatives, and subsistence fishing representatives on these issues.

Regarding the proposed Mercury Provisions, we advocate that the proposed policy be modified to take full advantage of available information and understanding we have derived from the significant collaborative work and research devoted to mercury standards and total maximum daily loads (TMDLs) over the past 15 years. As we have discussed, under the proposed implementation plan for municipal and industrial NPDES permittees, many point sources which are not significant contributors to mercury loadings would be required to install costly treatment plant upgrades. We do not believe this is an intentional action by the State Water Board, as it would not contribute to meaningful reductions in levels of mercury in fish tissue. In this letter and attachments, we have provided alternative language to avoid these unintended consequences.

As you are well aware, in addition to impacting mercury objectives, the proposed beneficial uses, once designated, will impact water quality objectives for numerous other pollutants, including all of the human health objectives currently governed by fish consumption considerations. We believe it has been instructive to see how the implementation of the proposed uses would impact mercury fish tissue objectives and related implementation measures. The specific issues arising with regard to mercury provide a good case example to inform future implementation of new beneficial uses for other pollutants of concern, many of which are legacy problems requiring different solutions. CVCWA and other NPDES-permitted entities sees the need to collaborate closely with you and your staff, Regional Water Boards, tribal and subsistence fishing representatives, and other key stakeholders to work on these issues to develop meaningful regulatory requirements and implementation plans.

As a prelude to providing our direct comments on the proposed uses and Mercury Provisions, we begin by reviewing the information that we presented in public at the February 7, 2017 hearing which highlights some of our major concerns with the Proposed Mercury Provisions.

As stated in our testimony, significant work has been done under the San Francisco Bay and Delta mercury TMDLs to increase our understanding of mercury sources, control measure effectiveness and fish tissue levels. In the Delta methylmercury TMDL (which was approved by the State Board in 2010 and has been in the Phase 1 implementation stage for almost five years), significant data collection, data analysis and control measure assessment activities have been undertaken by various entities. Under the CVCWA Methylmercury special project effort, accurate information has been developed to understand past, present and future POTW mercury source contributions to the Delta.

Figure 1 below shows the various sources of methylmercury to the Delta. The major sources, on a mass basis, are tributary rivers and streams, open water and wetlands. Loadings from POTWs, urban runoff and agricultural runoff are very small in proportion to the other sources. This chart also shows the diminishing load from POTWs as treatment upgrades to address existing NPDES permit requirements are implemented. These changes will occur over the next five to ten years, independent of other policies or requirements. These facts demonstrate that additional controls on POTWs and other insignificant mercury discharges to the Delta will not yield significant changes in either methylmercury loadings or methylmercury levels in fish. The question of whether major reductions can occur due to management of major sources is being studied under the Phase 1 TMDL effort; currently, this is a significant unknown. Clearly, if levels of mercury in fish are to dramatically decrease, this is where reductions must occur.

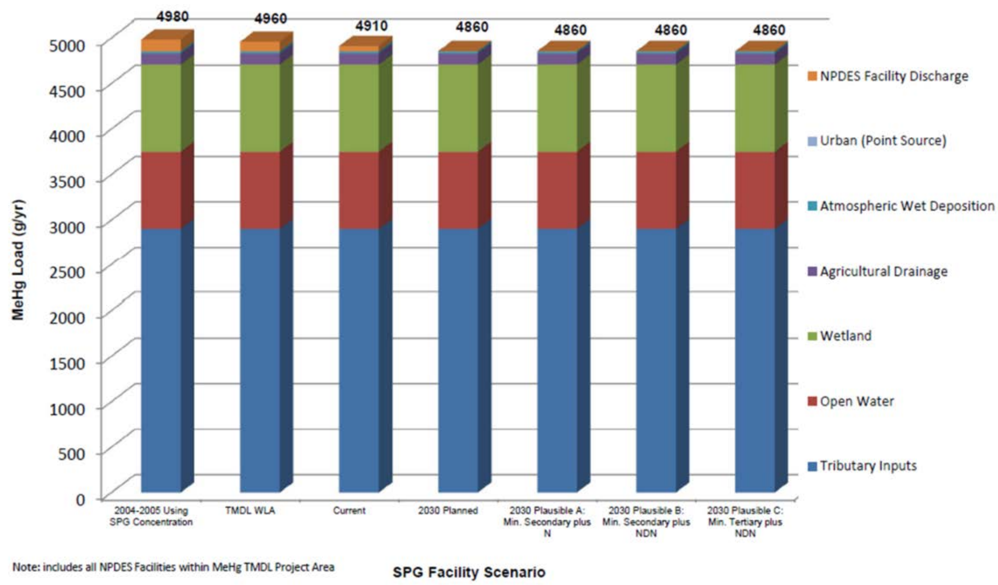



Fig. 1. Comparison of Methylmercury TMDL Project Area MeHg Loads at Varying SPG Facility Scenarios

Figure 2 below shows the ability of ten high-end, advanced wastewater treatment plants, consisting of nitrification, denitrification and tertiary filtration, to achieve the effluent limits described in the proposed Implementation Plan for NPDES dischargers. The chart shows the percentage of time that high performing POTWs could be expected to attain annual average effluent concentrations of total mercury ranging from 1 to 12 nanograms per liter (ng/l). Examination indicates that these plants could be expected to achieve 12 ng/l almost all the time, 4 ng/l 85% of the time, and 1 ng/l 33% of the time. The 1 ng/l effluent limit is associated with proposed fish tissue objectives for the Tribal Subsistence use in slow-moving waters. Arguably, this limit would pertain to most of the POTWs in the

Delta and in San Francisco Bay, where hydrodynamic conditions are tidally influenced. This would require most POTWs to upgrade beyond the most advanced treatment levels currently practiced in California. Given the insignificant beneficial impact of such actions (and the associated major resource commitment required to implement such actions), CVCWA and other POTW associations in California have identified the need to modify the NPDES implementation plan contained in the proposed Mercury Provisions.

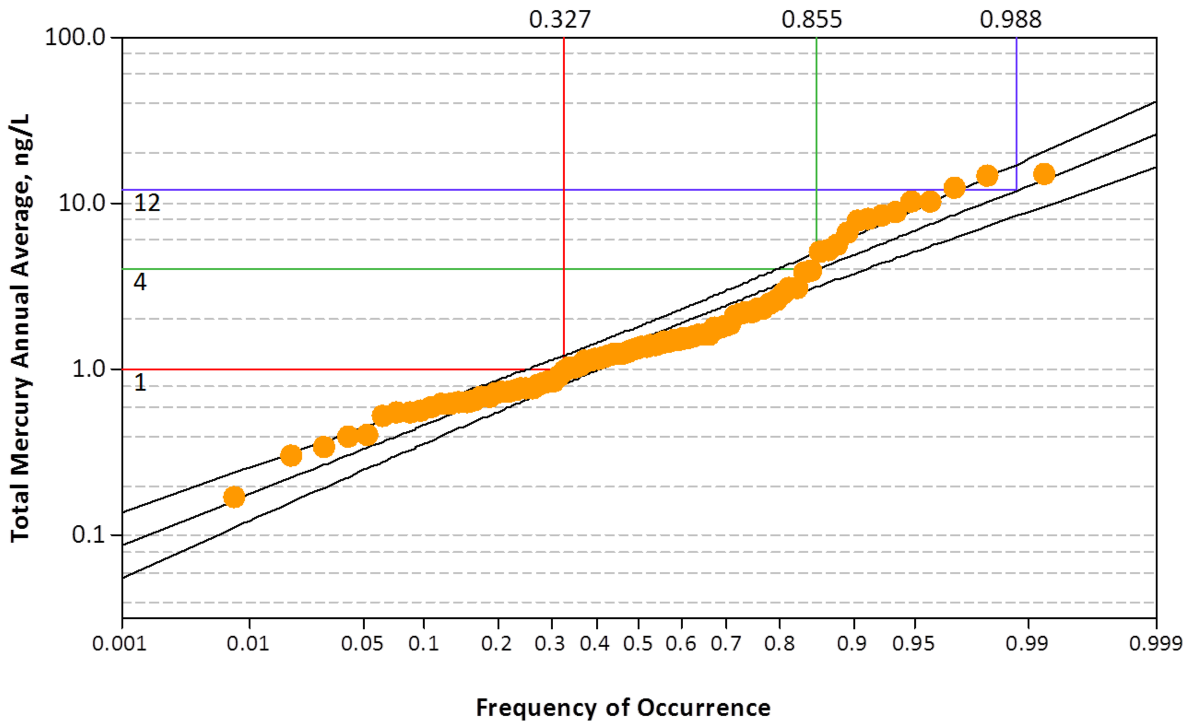



Fig. 2 Mercury Concentration Annual Average Probability Plot for Tertiary plus Nitrification/Denitrification Facilities

Full size versions of these two charts are included as Attachment A.

## A. Major Comments

CVCWA's major comments on the Proposed Beneficial Uses and Mercury Provisions are provided below. Our major comments fall under the following major topic areas:

- MC–1: Implementation of Mercury Water Quality Objectives - Municipal and Industrial Wastewater Dischargers
- MC-2: Implementation of Mercury Water Quality Objectives – Assignment of Mercury Abatement Responsibility to State Agencies
- MC-3: Guidance to Regional Water Boards regarding Designation and Implementation of Proposed Beneficial Uses
- MC-4: Clarification of Language in Beneficial Use Definitions
- MC-5: Process for Adoption of Mercury Fish Tissue Objectives

Note that, in this letter, we have not attempted to identify all associated changes in the staff report and other documents to reflect changes we have suggested to the regulatory language. We do request that such changes be made, by reference, and are willing to work with staff on those changes subsequent to deadline for these written comments.

We have also included several Other Comments at the end of this letter addressing more specific issues.

**MC-1: Implementation of Mercury Water Quality Objectives - Municipal and Industrial Wastewater Dischargers**

Our comments address three main topics pertaining to the proposed implementation plan for municipal and industrial NPDES dischargers:

- Use of Bioaccumulation Factors to convert fish tissue objectives to water column values
- Determination of Reasonable Potential
- Development of Effluent Limitations

Specific comments in these topic areas are provided below.

**Use of Bioaccumulation Factors to convert fish tissue objectives to water column values**

The proposal to use bioaccumulation factors as a key element of the proposed NPDES implementation approach for mercury creates unacceptable outcomes. The following comments are intended to clarify this issue and illuminate the need for a different implementation approach.

<u>The use of BAFs is Not Legally Required</u>

First, it is important to point out that the decision to use bioaccumulation factors (BAFs) in the proposed mercury provisions (specifically in the implementation for NPDES-permitted municipal and industrial point sources) is not driven by federal or state legal requirements under the Clean Water Act (CWA). The decision to use BAFs, instead, is a policy choice which is intended to simplify the analysis of reasonable potential and the derivation of effluent limitations in the NPDES permitting process. However, this choice is not without many disadvantages, many of which are obliquely recognized in the Staff Report/SED. Given that it is a policy choice for the State Board, it is also appropriate to identify and understand the disadvantages associated with this decision.

With regard to the legal question, it is instructive to examine the evolution of the use of BAFs in application to the regulation of mercury at both the federal and State levels. In 2000, USEPA adopted mercury water column standards for California as an element of the California Toxics Rule (CTR), using bioaccumulation factors in reaching that determination. In 2010, USEPA revisited national mercury objectives – at that point, EPA decided to adopt the national mercury standards as fish tissue standards (0.3 mg/kg wet weight, based on an assumed consumption rate of 17.5 grams per day)[see Appendix O of SED/staff report]. Notably, EPA refrained from taking the step of converting those fish tissue standards into water column standards through the application of BAFs, in large part due to the recognition that the determination and use of total mercury BAFs was unnecessary. Indeed, EPA's 2010 Guidance specifically states, "A state or authorized tribe could decide to develop TMDLs and to calculate WQBELs in NPDES permits directly without first measuring or calculating a BAF." (2010 Guidance, §3.1.2 at p. 21.)

In California, recent regulatory actions support the decision against using the BAF approach for translating fish tissue standards into water column concentration objectives. These examples come from the San Francisco Bay and Sacramento-San Joaquin Delta mercury TMDLs, which were approved by the State Water Board in 2007 and 2011, respectively. Notably, in neither case did these TMDLs convert fish tissue objectives into water column targets through the use of BAFs.

These examples are provided to clearly illustrate the point that the use of BAFs is not legally required under the CWA, and were not deemed appropriate from a policy standpoint. These examples also raise other considerations, as discussed below.

<u>There is no scientific consensus regarding the validity of the use of BAFs as proposed in the Mercury Provisions</u>

As noted above, probably the best California-specific evidence that BAFs are not well supported by science is the fact that neither the San Francisco Bay Mercury TMDL nor the Delta Methylmercury TMDL utilize a total mercury BAF (i.e. a multiplier that relates fish tissue concentrations to total mercury in the water column) as part of the TMDL implementation plan. Because the U.S. Environmental Protection Agency (US EPA) had advocated the use of BAFs in its 2001 Human Health guidance, this concept was considered, but not implemented for either TMDL. This is because evaluation of the relationship between total mercury concentrations in ambient waters showed no meaningful correlation with the levels of mercury in fish tissue. This conclusion led US EPA to revise its recommended approach for developing human health water quality objectives in 2010, wherein US EPA specifically rejected the BAF approach. According to the 2010 Human Health Guidance:

> Assessing and predicting methylmercury bioaccumulation in fish is complicated by a number of factors that influence bioaccumulation. These factors include the age or size of the organism; food web structure; water quality parameters such as pH, DOC, sulfate, alkalinity, and dissolved oxygen; mercury loadings history; proximity to wetlands; watershed land use characteristics; and waterbody productivity, morphology, and hydrology. In combination, these factors influence the rates of mercury bioaccumulation in various—and sometimes competing—ways. For example, these factors might act to increase or decrease the delivery of mercury to a waterbody, alter the net production of methylmercury in a waterbody (through changes in methylation and/or demethylation rates), or influence the bioavailability of methylmercury to aquatic organisms. Although bioaccumulation models have been developed to address these and other factors for mercury, their broad application can be limited by the site- or species-specific nature of many of the factors that influence

bioaccumulation and by limitations in the data parameters necessary to run the models. (2010 Human Health Guidance, §3.1.3.1 at p. 26.)

Use of BAFs Lead to Unintended and Inappropriate Consequences

A consequence of using BAFs to create water column values is that it facilitates the application of these water column numbers in the NPDES permitting process. The unintended consequence of this action is to lose track of the importance of NPDES sources to fish tissue concentrations at the watershed level, and instead to focus on an end-of-pipe approach to NPDES permitting. Whereas holistic assessment of mercury sources (as is developed under a TMDL framework) provides a clear picture of the relative importance of NPDES sources to fish tissue levels and provides context for establishing reasonable regulatory requirements, the end-of-pipe permitting approach fails to recognize or account for the relative importance of a permitted source. This leads to the situation, as described in the staff report, where significant treatment requirements are anticipated for municipal and industrial point sources, even though those sources are recognized to be minor in the same staff report on page 146.

Information developed for the Delta Methylmercury TMDL highlights this point. As shown in Figure 1, NPDES sources are very minor contributors to the overall mercury mass balance in the Delta. Further, those sources will decrease over the next few years due to other NPDES permit requirements which have mandated increased levels of treatment at major treatment facilities (SRCSD and City of Stockton). Figure 1 shows that requiring point source dischargers to install new, very expensive, treatment processes to further remove such miniscule amounts of mercury from their effluent would make no measurable impact on levels of mercury in fish in the Delta. However, use of BAFs as the first step in an NPDES permitting sequence, in combination with anticipated future subsistence fishing use designations and associated mercury fish tissue objectives, would require such action. This course is neither reasonable nor prudent, and we urge the State Water Board to reject it.

It should also be pointed out that the use of BAFs to create surrogate water column values for mercury only affects NPDES sources through the issuance of effluent limitations. As seen in the remainder of the implementation plan in the proposed mercury provisions, other far more significant sources, would not be affected by the decision to use BAFs as stated in the proposed policy. This further brings into question the policy choice to use total mercury BAFs as an element of the proposed implementation plan. As described below, if changes are made to the implementation language, the use of BAFs will not be necessary for NPDES permitting purposes.

When the US EPA revisited nationwide mercury objectives and appropriate implementation, they concluded that fish tissue standards were more appropriate for mercury criteria development to avoid the potentially unintended consequences, described above, as well as to more "closely tie" the "fishable designated use goal" to specific waterbodies, to more consistently relate applicable fish tissue concentration values with how fish advisories are issued, and because at environmentally relevant concentrations, some forms of mercury are easier to detect in fish tissue than in water samples. (See, Human Health Guidance, §3.1.2.2 at p. 22.)

## Determination of Reasonable Potential

With the establishment of new fish tissue objectives to protect the proposed three new beneficial uses, the obligation exists under USEPA CWA regulations (40 CFR 122.44) to evaluate whether NPDES-permitted discharges have the reasonable potential to cause or contribute to violations of those objectives. If "reasonable potential" is determined to exist, effluent limitations are to be included in NPDES permits to implement the subject fish tissue objectives.

As an alternative to the proposed implementation language in the Mercury Provisions, which relies on the use of BAFs to determine surrogate water column values and would modify Steps 1 through 5 of the existing NPDES reasonable potential analysis procedures (Section 1.3 of the State Implementation Policy (SIP)), we recommend that changes to Step 7 of Section 1.3 should be made. Step 7 allows for the consideration of "other information" in reaching a reasonable potential determination. This step in the process does not rely on the creation of surrogate water column values through the use of BAFs to interpret fish tissue objectives. In cases where TMDLs have already been approved and implemented, significant information exists which should guide the reasonable potential determination.

Suggested changes to Step 7 of the SIP reasonable potential procedures are included in Attachment B.

The State Water Board staff has recognized the minor (*de minimis*) nature of municipal and industrial point source dischargers to the mercury loading of many state waters in its staff report, and has proposed an exception for so-called, "insignificant discharges." While recognizing that many municipal and industrial point sources are indeed "insignificant discharges" to the overall mercury loading in any given water body, the State Water Board should state that, where, on a case-specific basis, that municipal or industrial point sources are determined to be *de minimis* (or insignificant) contributors of mercury, the permit writer would have discretion to determine that no reasonable potential exists to cause or contribute to water quality excursions, and thus not impose effluent limitations for mercury.

The suggested amendments to Step 7 of the SIP should allow the Regional Board permit writer to consider the relative mercury loading of a given discharger to a water body and, where appropriate, determine that there is no "reasonable potential" that would require the more restrictive water column concentration effluent limits. These determinations would not be mandatory but, rather, would provide sufficient discretion to the permit writer to utilize all appropriate data when determining whether new and more restrictive mercury WQOs should be imposed.

## Development of Effluent Limitations

Where a determination is made that effluent limitations are required because a discharge has reasonable potential to cause or contribute to a violation of fish tissue objectives for mercury, the implementation language in the proposed Mercury Provisions should describe an approach to the establishment of effluent limitations. The proposed Mercury Provisions put forward an approach that relies on the use of BAFs and water column values.

We recommend that an alternative approach be followed, as described below, consistent with past State Water Board and NPDES permitting approaches used in San Francisco Bay, and with legal precedent as described in *Communities for a Better Environment vs. State Water Resources Control Board* (2005) 132 Cal.App.4th 1313 ("CBEII"). This alternative approach intentionally avoids the use of BAFs and the associated problems as described above.

The recommended alternative approach to effluent limitations includes three elements, as described below and as captured in the markups shown in Attachment B:

- Interim Limitations – In water bodies where mercury TMDLs have been adopted and implemented, existing WLAs should serve as interim effluent limitations for point sources until amended TMDLs are developed and adopted. In water bodies where TMDLs are not yet adopted, but reasonable data confirm that point sources are *de minimis* contributors of mercury to the water, interim effluent limitations for point sources should be performance-based mass limits, intended to cap mercury mass loads until 303(d) listings and/or TMDLs have been adopted.

- Other interim requirements – In water bodies where TMDLs have been implemented, dischargers shall be required to continue to implement the requirements of those TMDLs. In addition, dischargers shall be required to participate in stakeholder processes to identify and assess the feasibility of control measures and strategies to reduce the major sources which are influencing fish tissue concentrations in the subject water body and to otherwise support development of future TMDLs. In water bodies where TMDLs have not been adopted, dischargers should be required to demonstrate implementation of best practices for mercury source control, including pollution prevention and industrial pretreatment. In addition, dischargers should be required to participate in stakeholder processes to identify and assess the feasibility of control measures and strategies to reduce both the major sources which are influencing fish tissue concentrations in the subject water body, as well as potential risks to consumers of fish, and to otherwise support development of future TMDLs.

- For interim limitations or requirements, long-term averages, such as annual averages, should be used rather than short-term averages, like weekly or monthly averages.

- Final WQBELs – Final WQBELs may be the WLAs developed under future TMDLs associated with future designated beneficial uses and associated fish tissue objectives. Alternatively, final WQBELs could be determined using one of the methods described in USEPA TMDL guidance for establishing WLAs. Such methods provide flexibility to take various factors, including relative source load contributions and existing control measures into account in the establishment of WLAs.

**MC-2: Implementation of Mercury Water Quality Objectives – Assignment of Mercury Abatement Responsibility to State Agencies**

California's regulatory and public health agencies have long been aware that fish and other aquatic-dependent wildlife are at risk for bio-accumulating methylmercury. In some instances, higher-tropic (larger) fish contain elevated levels of mercury in fish tissue that are consumed by humans, leading to fish consumption advisories by public health agencies. Over the past 15 or so years, considerable information about sources of mercury, control strategies, risk reduction and communication, and the underlying ability to achieve significant reductions in fish tissue mercury levels has been developed by Regional Boards. In some cases, these efforts have resulted in the development of TMDL budgets and plans for achieving reductions in the amount of mercury loading to those water bodies.

An important result of the studies and work leading up to Mercury TMDLs in various parts of the state is the recognition that traditional "point sources" - municipal and industrial wastewater treatment facilities – are considered to be an extremely small portion of the ongoing load of mercury to state waters. The *de minimis* nature of these point source contributions to ongoing mercury loading can be traced to aggressive pre-treatment, pollution prevention, and active treatment technologies over the past two decades. Indeed, municipal and industrial dischargers combined account for only about 1.4 percent of the ongoing mercury loading to San Francisco Bay. Planned NPDES loads to the Delta based on current permit requirements will represent less than 0.1 percent of the methylmercury load in 2030.

By comparison, open water, tributaries and existing wetlands are known to account for about 93.8 percent of ongoing mercury loading in the Delta. In San Francisco Bay, over 75 percent of the ongoing loading of mercury is coming from the Central Valley watershed, natural bed erosion, and atmospheric deposition. In both instances, the Regional Boards have struggled to find effective means of controlling these "untethered" sources of most of the mercury continuing to be taken-up by fish and other biota in the waters.

In 2010, the Central Valley Regional Board took the unprecedented step of assigning responsibility for open water and tributary sources of mercury to those State of California and federal agencies responsible for managing the land and water from which these mercury loads are derived. In its 2010 Delta Methylmercury TMDL, the Central Valley Regional Board specifically found that transportation and deposition of mercury-contaminated sediment from water management activities contribute to the Delta fish mercury impairment.

Specifically, the Regional Board determined that the State and Federal Water Projects affect the transportation of mercury and the production and transportation of methylmercury. Activities including water management and storage in and upstream of the Delta and Yolo Bypass, maintenance of and changes to salinity objectives, dredging and dredge materials disposal and reuse, and management of flood conveyance flows are subject to the open water methylmercury allocations. Agencies responsible for these activities in the Delta and Yolo Bypass include, but are not limited to, the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), and State Water Resources Control Board. The Regional Board also determined that the State of California owns and manages lands and waters of the state that contribute to methylmercury loads. As a result, the State Lands Commission and Department of Water Resources were also assigned responsibility for addressing these mercury contributions to the overall fish impairment.

Pursuant to the Delta Methylmercury TMDL, the state and federal agencies named as responsible parties must take the following actions:

- Characterize their projects' effects on ambient methylmercury and total mercury concentrations and loads in the Yolo Bypass and Delta;
- Conduct methylmercury and total mercury control studies to evaluate options to reduce methylmercury production in open waters under jurisdiction of the State Lands Commission and floodplain areas inundated by managed flood flows; and
- Minimize to the extent practicable any methylmercury and/or total mercury loading to the Delta and Yolo Bypass resulting from new and existing projects using feasible management practices that are not in conflict with salinity standard or other mandates (*e.g.*, minimum flow and temperature mandates).

Assigning state and federal agency responsibility for mercury loads coming from land or projects over which these agencies have responsibility is reasonable, fair, and just. Without doing so, there is literally no hope of successfully abating mercury in fish from some California waters. Holding these state and federal agencies responsible is consistent with existing laws, regulations and authorities of the State and Regional Water Boards.

If the State Water Board intends to do everything reasonably possible to address mercury impairment of California's waters and the fish taken from them by tribal, subsistence and sport fishers, it is now time to assign responsibility for reducing ongoing mercury loading to the extent feasible to those state and federal agencies who own, operate, use or lease land and water projects that contribute to mercury to the systems. The State of California should also be asked to step forward to lead the public messaging and communication efforts to manage the risk from exposure to mercury in fish to women of child bearing age, children and other consumers of locally caught fish.

**MC-3: Guidance to Regional Water Boards regarding Designation and Implementation of Proposed Beneficial Uses**

The State Water Board should provide direction to Regional Water Boards in the following areas regarding the designation and implementation of the three new beneficial uses:

- How new beneficial uses should be designated in specific water bodies, including criteria for making this determination and a process for collecting, utilizing and interpreting fish consumption information;
- How to identify significant and insignificant sources, including generation and consideration of information regarding the relative contribution of sources, with an emphasis on

information developed as an element of an existing TMDL or through a TMDL-like analysis, and including legacy impacts associated with sediments flux, air deposition sources and other non-point source contributions; and

- The need to convene key stakeholders (tribes, subsistence fishing community, regulated community, State of California) as an element of the designation process and to address adoption and implementation of water quality objectives for designated uses. Considerations should include the full range of possible management measures and effectiveness, with the purpose of developing a common understanding of problems and potential solutions.

Suggested language for a State Water Board resolution is included as Attachment C to this letter.

**MC-4: Clarification of Language in Beneficial Use Definitions**

CVCWA remains concerned about the lack of limitations for the Tribal Tradition and Culture Use (CUL). Once a beneficial use is established and applied to a specific waterbody, that use must be protected, maintained, or attained where attainment does not currently occur. The proposed CUL use definition in the Staff Report provides no limitations as to how and when the use should be applied. This use currently includes "uses of water that support the cultural, spiritual, ceremonial, or traditional rights or lifeways of California Native American Tribes, including, but not limited to: navigation, ceremonies, or fishing, gathering, or consumption of natural aquatic resources, including fish, shellfish, vegetation, and materials." It is difficult to see how this use could be protected, given that many of California's waterbodies have been highly modified over the years. This use should be revised with reasonable limitations, taking into account other factors, such as other uses of water, attainment expectations, and seasonality.

As has been discussed with your staff, concern exists regarding an element of the T-SUB and SUB beneficial uses definitions. The definitions for Tribal Subsistence Fishing (T-SUB) and Subsistence Fishing (SUB) both contain the word "individuals." The concern is that there may be confusion that this term is intended to indicate for any highly exposed individual engaging in the specified use. Use of the term "individuals", without further clarification or context, may lead to beneficial use designations for entire water bodies based on the activities of a single person. This approach would not be reasonable or feasible.

Based on our discussions, we do not believe this is the intent of the State Water Board in using this terminology. We therefore would ask for the addition of clarifying language. Specifically, we suggest the following additions:

Footnote to be added inSection II. BENEFICIAL USES.

5) Tribal Subsistence Fishing (T-SUB): Uses of water involving the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, for consumption **by individuals [see footnote],** households, or communities of California Native American Tribes to meet minimal needs for sustenance.

6) <u>Subsistence Fishing (SUB)</u>: Uses of water involving the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, for consumption **by individuals [see footnote],** households, or communities, to meet minimal needs for sustenance.

**[Footnote] –** In the context of the T-SUB and SUB beneficial uses, the terms “individuals” or “households” are not intended to cover a single individual or single household engaging in these beneficial uses in a given waterbody. A single individual or household engaging in either the T-SUB or SUB beneficial use would not be, on its own, a basis for designation by a Regional Board, nor would consumption rates by a single individual or household constitute a reasonable baseline for establishing water quality objectives to protect that use.

This language should also be inserted into the Staff Report at p. 6. (Section 2.3.1) and elsewhere in the report where the T-SUB and SUB uses are referenced.

Finally, the Staff Report does not indicate that a Use Attainability Analysis is required for all three proposed beneficial uses, pursuant to federal law. Federal regulations require a use attainability analysis as described in 40 CFR section 131.10(g) when a state designates uses beyond uses specified in Clean Water Act section 101(a)(2). The uses in Clean Water Act section 101(a)(2) are for the protection and propagation of fish, shellfish and wildlife, and provide for recreation in and on the waters, informally referred to as the “fishable-swimmable uses”. The proposed CUL, T-SUB, and SUB beneficial uses are not fishable-swimmable uses, and therefore any designation of such uses may occur only after the Regional Water Board has conducted a use attainability analysis pursuant to 40 CFR section 131.10(g). We recommend that the Staff Report be revised to include the acknowledgement that a use attainability analysis must be conducted before any of the proposed beneficial uses can be designated to a water body and provide guidance to Regional Board in making designation determinations.

**MC-5: Process for Adoption of Mercury Fish Tissue Objectives**

Water Code section 13241 requires Regional Boards (and the State Water Board) to establish water quality objectives that, in its judgment, will ensure the reasonable protection of beneficial uses. In establishing water quality objectives, the following factors (and others) shall all be considered:

- The past, present and future beneficial uses
- The ability to reasonably achieve water quality conditions through coordinated control of all factors which affect water quality in the area
- Economics

<u>The past, present and future beneficial uses</u>

A key consideration is whether the ability to consume fish containing mercury at the levels prescribed in the proposed mercury fish tissue objectives has existed since 1975. A second key consideration is whether it is likely that such a consumption use is likely to occur in the future. This information has not been considered in the proposed policy or staff report.

The ability to reasonably achieve water quality conditions through coordinated control of all factors which affect water quality in the area

The staff report supporting the proposed Mercury Provisions does not include such an evaluation. While an implementation plan is included in the proposed policy, the effectiveness of that plan in achieving proposed water quality objectives is not addressed.

Economics

This requirement goes to the issue of whether required control measures associated with proposed water quality objectives meet the test of providing reasonable protection of beneficial uses. If resources are spent to implement control measures that will never meet the proposed objectives, this is to be considered as part of the process of establishing the objective. While the staff report includes an economic analysis, it does not consider whether control measures and associated costs are reasonable in terms of achieving the desired water quality conditions as reflected in the proposed water quality objectives.

Section 13242 of the Water Code requires that a program of implementation be developed and documented, wherein the control measures necessary to achieve proposed objectives would be identified.

**B. Other Comments**

The following other comments address more detailed aspects of the proposed policy and accompanying staff report.

**OC -1: Section 6.14 Issue N - Success and responsibility of Exposure Reduction Program should be clarified/corrected.**

- This section currently states incorrectly: **"***The San Francisco Bay mercury TMDL included a public exposure reduction program that was fairly successful (CDPH 2012). The success of the San Francisco Bay program was partly attributed to the assistance provided by CDPH. However, those resources have not been available for the public exposure reduction program for the Sacramento San Joaquin Delta, and it has been a struggle to put that program into action."* Correct this statement to indicate that CDPH and other agencies such as the Delta Conservancy were utilized as resources for the Sacramento San Joaquin Delta and recognize that this program is still in progress.
- Risk reduction activities associated with the San Francisco Bay mercury TMDL are still ongoing. The first sentence in the above paragraph should be edited to read: "*The San Francisco Bay mercury TMDL includes a public exposure reduction program that is fairly successful (CDPH 2012). The success of the San Francisco Bay program is partly attributed to the initial assistance provided by CDPH*."

- Also, remove the indication that the program has been a "~~struggle~~" to put into action.
- Add ***"The State should participate more in future exposure reduction activities, including participation from agencies such as the Delta Conservancy and the CDPH, with assistance from regulated dischargers and responsible parties."***

**OC-2: Text contained within the staff report is inconsistent with respect to its application to water bodies with existing TMDLs.**

Recommendation: Use the same text where requirements associated with current TMDLs are mentioned because currently it varies such as:

- Pg xviii: "*However, the water quality objectives would not apply to the waters described above where site-specific mercury water quality objectives are established.*"
- Pg 13: "*The Provisions' program of implementation would apply to the same waters as the Mercury Water Quality Objectives, but the implementation provisions would not apply to dischargers that discharge to receiving waters for which a mercury or methylmercury total maximum daily load (a mercury or methylmercury TMDL) has been approved.*"
- Pg 34: "Therefore, the Provisions' mercury objectives for the COMM and WILD beneficial uses do not supersede the site-specific objectives listed in Table 3-2."
- (SWB Staff should review other sections too for similar but not identical text).

Suggested language for inclusion
**"The Provisions and Water Quality Objectives do not supersede established site-specific water quality objectives, and do not apply to waters for which a mercury TMDL (or other specified contaminant TMDL) has been approved."**

Also, delete the text on page 40 of the staff report that says: ***~~"When the Regional Water Boards revisit these TMDLs, if they used 17.5 g/day as a consumption rate, they should consider updating it to 32g/day. This change should not make a substantial difference in the implementation for the reasons just described, but it would make targets more consistent statewide."~~***

**OC-3: Appendix Table C-1 appears to be incomplete.**

Recommendation: Add "Yes" to Sacramento River (Knights Landing to the Delta) to indicate development of a mercury/methylmercury TMDL for that water body. Other water bodies may also need an updated status.

**OC-4: IV.D.2 Methods, Routine, Monitoring, and Compliance Schedules, Subsection 3.**

*"Compliance Determination: The annual average mercury concentration in the effluent shall be calculated as an arithmetic mean. For any sample reported as below the detection limit, one-half of the detection limit shall be used to calculate the arithmetic mean. For any sample reported as below the quantitation limit and above the detection limit, the estimated concentration shall be used to calculate the arithmetic mean."*

DNQ are indicators of presence/absence for RP analysis but should not be used as quantified data. CVCWA recommends that the final draft Implementation of Water Quality Objectives for mercury include reporting protocols similar to those already adopted by Regional Boards for other NPDES permits.[1]

> Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.
>
> When determining compliance for multiple sample data and the data set contains one or more reported determinations of DNQ of "Not Detected" (ND), the Discharger shall compute the median in place of the arithmetic mean.

**OC-5: IV.D.2 Methods, Routine, Monitoring, and Compliance Schedules, Subsection 1.**

> *"Methods: For monitoring total mercury in effluent, the discharger shall use any U.S. EPA-approved method that has a quantitation limit lower than the effluent limitation."*

CVCWA recommends further clarification to specify that the discharger shall conduct analysis according to test procedures approved under 40 CFR Part 136. For NPDES dischargers, "The analytical methods specified under 40 CFR Part 136 are required for all monitoring performed under the NPDES Program, unless the permit specifically requires alternate methods."2

Again, we thank you for the opportunity to provide these comments. We look forward to working with you and your staff to refine the current proposed policy language and to craft effective solutions applicable to future designation and implementation of the new beneficial uses and the associated Mercury Provisions.

Sincerely,

Debbie Webster

Debbie Webster, Executive Officer
Central Valley Clean Water Association (CVCWA)

[1] Reporting protocols as stipulated in Monitoring and Reporting Programs such as NPDES Order No. R5-2010-0114-01 for the Sacramento Regional County Sanitation District.
[2] NPDES Permit Writers' Manual (EPA-833-K-10-001), Section 7.1.3.

Adam Link
California Association of Sanitation Agencies (CASA)

Steven Jepsen
Southern California Alliance of POTWs (SCAP)

David Williams
Bay Area Clean Water Agencies

CC: [SWRCB members]

APPENDICES

Attachment A– CVCWA Delta Methylmercury Charts
Attachment B – Markup of Regulatory Language
Attachment C – Suggested language for SWRCB Resolution

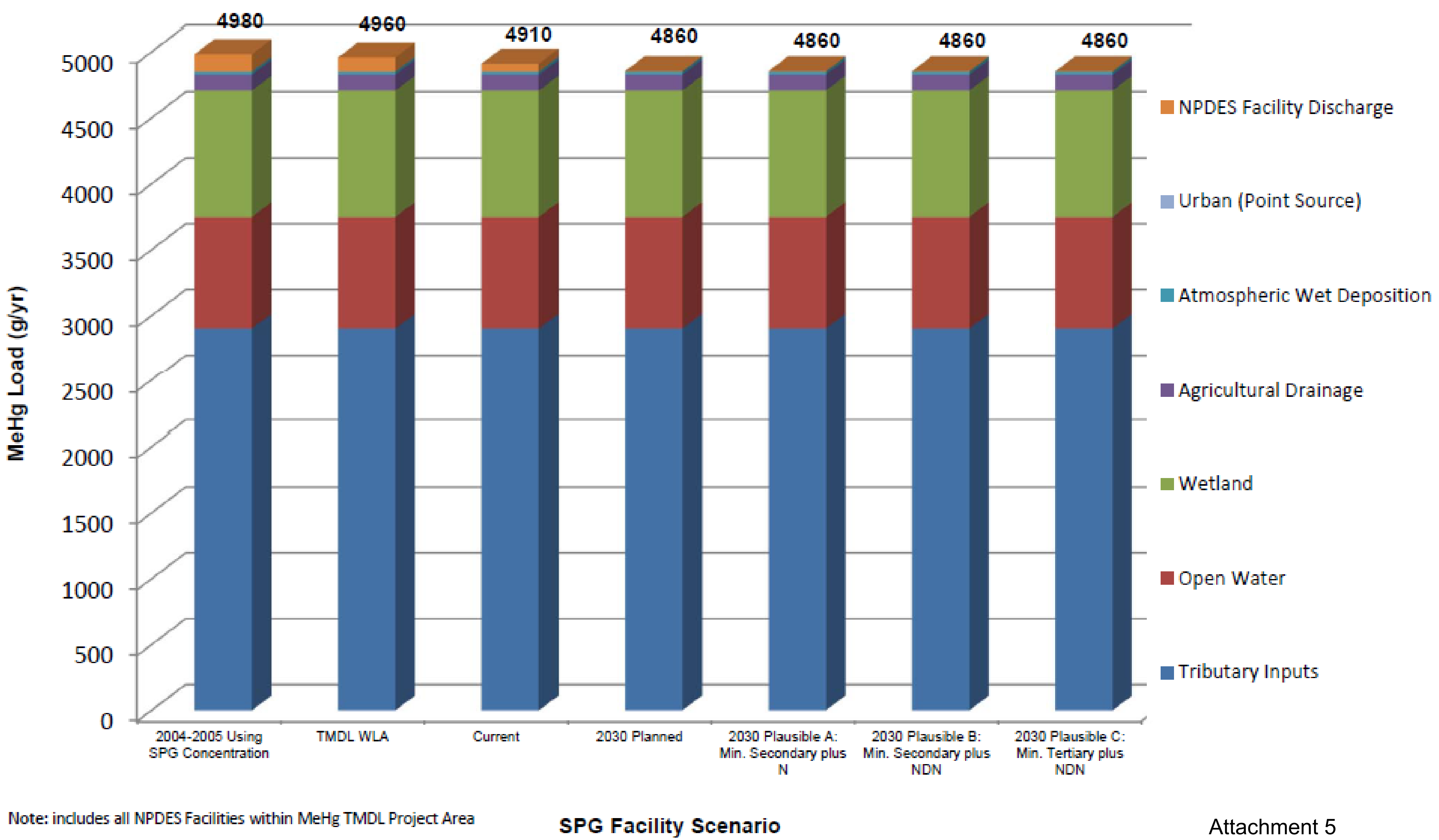
# ATTACHMENT A

# CVCWA Testimony
# SWRCB Hearing
# Proposed Mercury Provisions

February 7, 2017

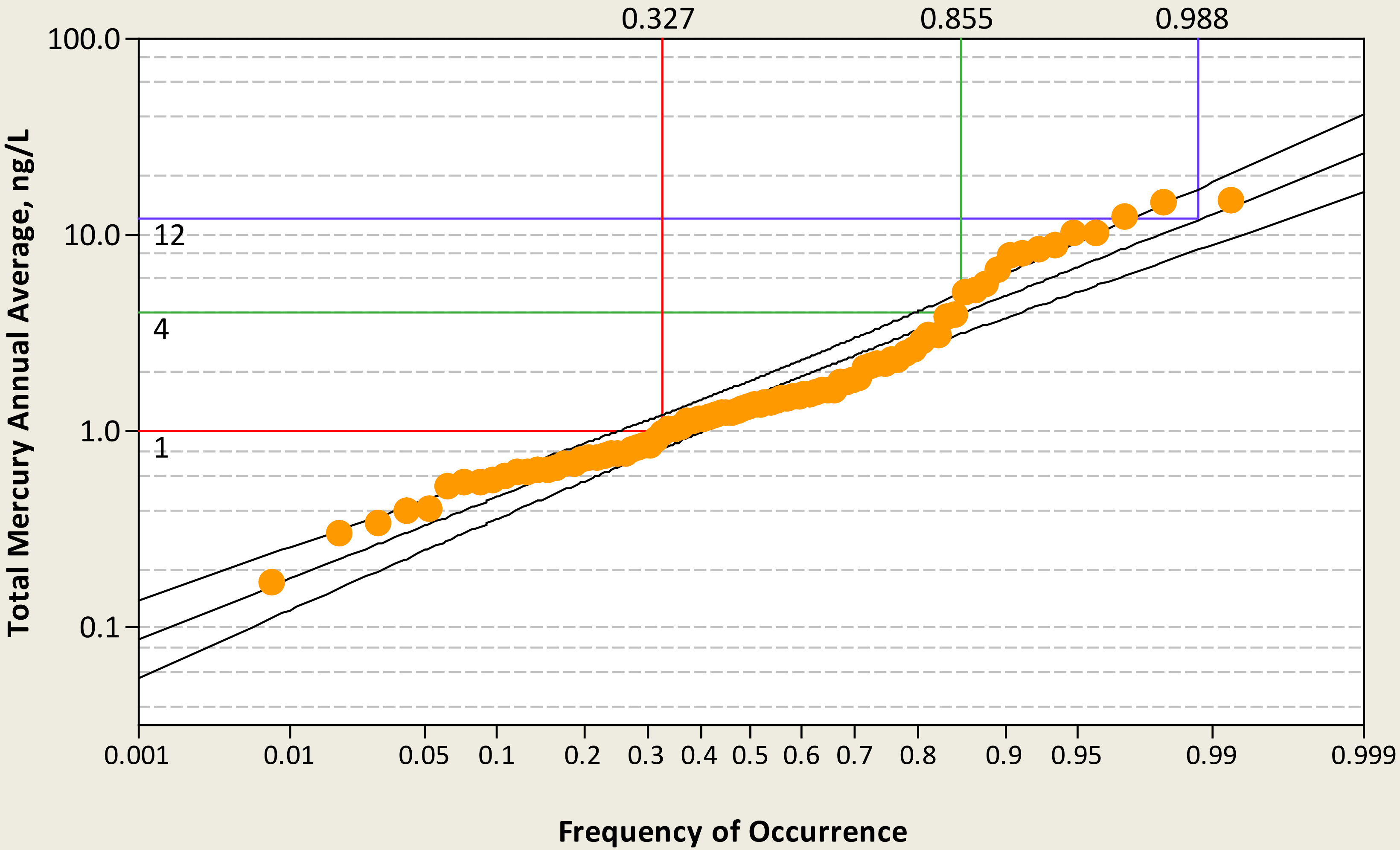
Thomas Grovhoug, LWA

# Comparison of MeHg TMDL Project Area MeHg Loads at Varying SPG Facility Scenarios




Note: includes all NPDES Facilities within MeHg TMDL Project Area

# Hg Concentration Annual Average Probability Plot for Tertiary plus NDN Facilities



# ATTACHMENT B

*Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions (Part 2).*[11] *Part 2 would constitute new regulatory language.]*

## II. BENEFICIAL USES

*[Proposed text to be added to Chapter II (Beneficial Uses) of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan).]*

A Regional Water Quality Control Board shall use the beneficial uses and abbreviations listed below, to the extent it defines such activities in a water quality control plan after *[insert effective date of Part 2]*.

To designate the Tribal Tradition and Culture or Tribal Subsistence Fishing beneficial uses in a water quality control plan for a particular waterbody segment and time(s) of year, a CALIFORNIA NATIVE AMERICAN TRIBE must confirm the designation is appropriate. No confirmation is required to designate the Subsistence Fishing beneficial use in a water quality control plan.

The Tribal Subsistence Fishing and Subsistence Fishing beneficial uses relate to the risks to human health from the consumption of noncommercial fish or shellfish. The two subsistence fishing beneficial uses assume a higher rate of consumption of fish or shellfish than that protected under the Commercial and Sport Fishing and the Tribal Tradition and Culture beneficial uses. The function of the Tribal Subsistence Fishing and Subsistence Fishing beneficial uses is not to protect or enhance fish populations or aquatic habitats. Fish populations and aquatic habitats are protected and enhanced by other beneficial uses, including but not limited to, Aquaculture, Warm Freshwater Habitat, and Cold Freshwater Habitat, that are designed to support aquatic habitats for the reproduction or development of fish.

4) <u>Tribal Tradition and Culture (CUL)</u>: Uses of water that support the cultural, spiritual, ceremonial, or traditional rights or LIFEWAYS of California Native American Tribes, including, but not limited to: navigation, ceremonies, or fishing, gathering, or consumption of natural aquatic resources, including fish, shellfish, vegetation, and materials.
5) <u>Tribal Subsistence Fishing (T-SUB)</u>: Uses of water involving the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, for consumption by individuals, households, or communities of California Native American Tribes to meet minimal needs for sustenance.
6) <u>Subsistence Fishing (SUB)</u>: Uses of water involving the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, for consumption by individuals, households, or communities, to meet minimal needs for sustenance.

## III. WATER QUALITY OBJECTIVES

[*Proposed text to be added to Chapter III (Water Quality Objectives) of the ISWEBE Plan.*]

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[11] The State Water Board intends to amend the Water Quality Control Plan for Enclosed Bays and Estuaries of California to create the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California Plan (ISWEBE Plan). The State Water Board intends that Part 2 will be incorporated into the ISWEBE Plan, upon the ISWEBE Plan's adoption.

## D. Mercury

### 1. Applicability

Chapter III.D.2 establishes water quality objectives for the reasonable protection of people and wildlife that consume fish and apply to all the inland surface waters, enclosed bays and estuaries of the State that have the applicable beneficial uses. The water quality objectives that protect people who consume fish apply to waters with the COMM, CUL, T-SUB, and SUB[12] beneficial uses. The water quality objectives that protect wildlife that consume fish apply to waters with WILD, MAR, RARE, WARM, COLD, EST, and SAL beneficial uses.[13]

### Mercury Water Quality Objectives

Chapter III.D.2 contains five numeric mercury fish tissue water quality objectives, which are formulated for one or more of the applicable beneficial uses, depending on the consumption pattern (which includes consumption rate, fish size, and species) by individuals and wildlife. Additionally, different sizes and species of fish contained at a water body will, in some cases, affect whether a particular water quality objective may be utilized to evaluate whether one or more beneficial uses are supported. Therefore, the fish in a particular water body would dictate which water quality objective(s) must be evaluated to ensure all the applicable wildlife beneficial uses are supported, as discussed below and illustrated in the flow chart in Attachment B. For any of the mercury fish tissue water quality objectives, measurements of total mercury concentrations in fish tissue may be substituted for methylmercury concentrations in fish tissue.

#### a. Sport Fish Water Quality Objective

1) Application of the Sport Fish Water Quality Objective

The Sport Fish Water Quality Objective for mercury applies to waters with the beneficial uses of COMM, CUL[14], WILD, and MAR. However, in some circumstances (i.e., depending on whether TROPHIC LEVEL 3[15] or TROPHIC LEVEL 4 fish are in the water body), with respect to the WILD and MAR beneficial uses, additional water quality objectives also need to be utilized to evaluate whether consumption of fish by all wildlife species is supported (see below discussion).

With respect to the WILD and MAR beneficial uses, the Sport Fish Water Quality Objective may be used to evaluate whether all species are supported only when applied

12 The water quality objective applicable to the SUB beneficial use (see Section III.D.2.c) also applies to the Subsistence Fishing (FISH) beneficial use contained in the North Coast Regional Water Quality Control Board's water quality control plan. (Water Quality Control Plan for the North Coast (May 2011), p. 2-3.00.)

13 Any explicit reference in the MERCURY PROVISIONS to the WILD and MAR beneficial uses shall hereinafter include the WARM, COLD, EST, and SAL beneficial uses.

14 If site-specific studies indicate a consumption pattern under the CUL beneficial use higher than the consumption rate used for the objective to support the COMM beneficial use, then the Regional Water Board should consider adopting a site-specific objective to protect consumption of fish under the CUL beneficial use.

15 Terms in "all cap" font (excepting the beneficial use abbreviations) are defined in Attachment A (Glossary).

to TROPHIC LEVEL 4 fish, except with respect to the California least tern (as discussed in Chapter III.D.2.e). If the objective is measured using TROPHIC LEVEL 3 fish, protection of all wildlife species within the WILD and MAR beneficial uses is not ensured. Therefore, if TROPHIC LEVEL 3 fish are used, then the Prey Fish Water Quality Objective (as described in Chapter III.D.2.d) shall be used, but if the water body is habitat for California least tern, then the California Least Tern Prey Fish Objective (as described in Chapter III.D.2.e) shall be used. However, if the Sport Fish Water Quality Objective is exceeded when applied to TROPHIC LEVEL 3 fish, that is sufficient evidence to indicate that the Prey Fish Water Quality Objective or, if applicable, the California Least Tern Prey Fish Objective is also exceeded without having to measure the two latter objectives (see flow chart in Attachment B).

2) Sport Fish Water Quality Objective
The Sport Fish Water Quality Objective is: The average methylmercury concentrations shall not exceed 0.2 milligrams per kilogram (mg/kg) fish tissue within a calendar year. The water quality objective applies to the WET WEIGHT concentration in skinless fillet in TROPHIC LEVEL 3 or TROPHIC LEVEL 4 fish, whichever is the HIGHEST TROPHIC LEVEL FISH in the water body. Freshwater TROPHIC LEVEL 3 fish are between 150 to 500 millimeters (mm) in total length and TROPHIC LEVEL 4 fish are between 200 to 500 mm in total length, except for sizes specified in Attachment C, or as additionally limited in size in accordance with LEGAL SIZE LIMIT for the species caught. Estuarine fish shall be within the LEGAL SIZELIMIT and greater than 150 mm, or as otherwise specified in Attachment C.

**b. Tribal Subsistence Fishing Water Quality Objective**

1) Application of the Tribal Subsistence Fishing Water Quality Objective
The Tribal Subsistence Fishing Water Quality Objective applies to waters with the T-SUB beneficial use.

2) Tribal Subsistence Fishing Water Quality Objective
The Tribal Subsistence Fishing Water Quality Objective is: The average methylmercury concentrations shall not exceed 0.04 mg/kg fish tissue within a calendar year. The objective applies to the WET WEIGHT concentration in skinless fillet from a mixture of 70 percent TROPHIC LEVEL 3 fish and 30 percent TROPHIC LEVEL 4 fish as detailed in Attachment C.

**c. Subsistence Fishing Water Quality Objective**

1) Application of the Subsistence Fishing Water Quality Objective
The Subsistence Fishing Water Quality Objective applies to waters with the SUB beneficial use or to waters with the FISH beneficial use (see footnote 2).

2) Subsistence Fishing Water Quality Objective
The Subsistence Fishing Water Quality Objective is: Waters with the Subsistence Fishing (SUB) beneficial use shall be maintained free of mercury at concentrations which accumulate in fish and cause adverse biological, reproductive, or neurological effects. The fish consumption rate used to evaluate this objective shall be derived from water

body- and population-specific data and information on the subsistence fishers' rate and form (e.g. whole, fillet with skin, skinless fillet) of fish consumption.[16]

When a water quality control plan designates a water body or water body segment with the Subsistence Fishing (SUB) beneficial use, development of a region-wide or site-specific numeric fish tissue mercury water quality objective is recommended to account for the wide variation of consumption rate and fish species encompassed by the SUB beneficial use.

### d. Prey Fish Water Quality Objective

1) Application of the Prey Fish Water Quality Objective

The Prey Fish Water Quality Objective applies to waters with the WILD and MAR beneficial uses. However, the objective does not apply to water body segments where the California Least Tern Prey Fish Water Quality Objective applies (see Chapter III.D.2.e).

2) Prey Fish Water Quality Objective

The Prey Fish Water Quality Objective is: The average methylmercury concentrations shall not exceed 0.05 mg/kg in WET WEIGHT whole fish tissue of any species between 50 to 150 mm in total length during the breeding season. The breeding season is February 1 through July 31, unless site-specific information indicates another appropriate breeding period.

### e. California Least Tern Prey Fish Water Quality Objective

1) Application of the California Least Tern Prey Fish Water Quality Objective

The California Least Tern Prey Fish Water Quality Objective applies to water with the WILD, MAR, and RARE beneficial uses at water bodies where the least tern or least tern habitat exists, including but not limited to the water bodies identified in Attachment D.

2) California Least Tern Prey Fish Water Quality Objective

The California Least Tern Prey Fish Water Quality Objective is: The average methylmercury concentrations shall not exceed 0.03 mg/kg fish tissue from April 1 through August 31. The objective applies to the WET WEIGHT concentration in whole fish less than 50 mm total length.

[16] U.S. EPA recommended national subsistence fishing consumption rate of 142 grams per day (4 to 5 meals per week) shall be used to translate the narrative objective unless a site-specific numeric water quality objective is developed or an external peer-reviewed consumption study uses a different methodology to translate the narrative water quality objective.

### Interaction of Mercury Water Quality Objectives with Basin Plans

The MERCURY WATER QUALITY OBJECTIVES do not supersede any site-specific numeric mercury water quality objectives established in a Basin Plan, except (i) the freshwater mercury water quality objective for chronic effects to aquatic life (0.025 µg/L) established in the San Francisco Bay Basin Water Quality Control Plan (Table 3-4, and corresponding note); and (ii) the total body burden of 0.5 µg/g wet weight established for the mercury water quality objective for aquatic organisms in the Water Quality Control Plan for the Central Coastal Basin (see note accompanying Table 3-5).

# IV. IMPLEMENTATION OF WATER QUALITY OBJECTIVES

[*Proposed text to be added to Chapter IV (Implementation of Water Quality Objectives) of the ISWEBE Plan.*]

## D. Mercury

### 2. General Applicability of the Mercury Implementation Provisions

The implementation provisions of Chapter IV.D shall be implemented through NPDES permits issued pursuant to section 402 of the Clean Water Act, water quality certifications issued pursuant to section 401 of the Clean Water Act, waste discharge requirements (WDRs), and waivers of WDRs, where any of the MERCURY WATER QUALITY OBJECTIVES apply. The implementation provisions pertaining to a particular beneficial use do not apply to dischargers that discharge to receiving waters for which a mercury or methylmercury total maximum daily load (TMDL) is established pertaining to the same beneficial use or uses.[17]

### Municipal Wastewater and Industrial Discharges

#### a. Applicability

Chapter IV.D.2 applies to dischargers issued individual non-STORM WATER National Pollutant Discharge Elimination System (NPDES) permits. The PERMITTING AUTHORITY shall incorporate the following requirements, as applicable, into NPDES permits during every permit issuance or renewal.

#### b. Water Column Translations

Because the Mercury Water Quality Objectives (Chapter III.D) are fish tissue based and not water column based, fish tissue based water quality objectives were converted to water column values (denoted as “C”) to be used for reasonable potential analysis and development of effluent limitations. The applicable value of C that corresponds with the water body/beneficial

[17] Such “receiving waters” are those for which a mercury or methylmercury TMDL is approved and does not include upstream water bodies even if the TMDL contains waste load allocations for the dischargers to the upstream water bodies to be implemented as effluent limitations to achieve the downstream water quality standard. For such upstream dischargers, the implementation provisions of Chapter IV.D apply. In the case where both the TMDL and application of the procedure at Chapter IV.D.2.c requires an effluent limitation, then the more stringent requirement shall apply to the discharge.

use designations in Table 1 shall be used to determine a discharger's REASONABLE POTENTIAL and any applicable effluent limitation (see Chapter IV.D.2.c). The PERMITTING AUTHORITY shall use its best judgement to assign the most appropriate water body type (in Table 1) based on the receiving water's potential for methylation during the period of discharge(s). Alternatively, a site-specific water column concentration value for C can be developed as described in Chapter IV.D.2.b.1, below.

Table 1. Values for C (water column concentration) based on water-body type and beneficial use.

| **Beneficial Use of the Receiving Water** | **COMM, CUL, WILD, MAR, RARE** | **COMM, CUL, WILD, MAR, RARE** | **COMM, CUL, T-SUB, WILD, MAR, RARE** | **T-SUB** | **T-SUB** | **SUB** |
|---|---|---|---|---|---|---|
| **Water body type** | Flowing water bodies (generally, rivers, creeks, and streams) | Slow moving water bodies (generally, lagoons and marshes) | Lakes and reservoirs | Flowing water bodies (generally, rivers, creeks, and streams) | Slow moving water bodies (generally, lagoons and marshes) | Any |
| **Value for "C"** | 12 ng/L total mercury | 4 ng/L total mercury | Case-by-case* | 4 ng/L total mercury | 1 ng/L total mercury | Case-by-case* |

*The PERMITTING AUTHORITY shall calculate C from the water quality objective, and may use available data, including U.S. EPA's recommended national bioaccumulation factors and chemical translators.

1) Site-Specific Water Column Translations

The PERMITTING AUTHORITY may develop a site-specific water column concentration value (C) by utilizing a site-specific BIOACCUMULATION FACTOR, linear regression model, or peer-reviewed model, derived from a study of the receiving water downstream of the discharge. The study must, at a minimum, include data from three separate time points. Data collected at each time point must all be collected on the same day from within the same vicinity and must include a minimum of: 1) four total mercury water column samples, 2) four dissolved methylmercury water column samples, and 3) ten mercury fish tissue samples. The fish tissue samples shall be from TROPHIC LEVEL 4 FISH, but if TROPHIC LEVEL 4 FISH are not the HIGHEST TROPHIC LEVEL FISH in the water body, then the samples shall be from the size of fish that corresponds with the Prey Fish Water Quality Objective or California Least Tern Prey Fish Water Quality Objective, whichever is applicable (see Chapter III.D.2). The sampling time points shall be at least 90 days apart. If TROPHIC LEVEL 4 FISH are not the HIGHEST TROPHIC LEVEL FISH in the water body, then two of the sampling time points shall occur during the breeding season for the applicable water quality objective. A site-specific BIOACCUMULATION FACTOR shall be calculated as the mean methylmercury tissue concentration in one trophic level divided by the mean methylmercury concentration in water. Multiple bioaccumulation factors from different time points or different species shall be combined using a geometric mean. To derive water column concentration in the form of total mercury, a chemical translator must also be used to convert form methylmercury to total mercury.[18]

#### c. Determining Whether A Discharge Requires an Effluent Limitation for Mercury

1) Reasonable Potential Analysis

A PERMITING AUTHORITY is required to apply section 1.3 of the State Water Resources Control Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (generally referred to as the SIP) (pages 5-8), to determine whether a discharge has REASONABLE POTENTIAL, in which case the permit must contain a water quality-based effluent limitation.

To determine REASONABLE POTENTIAL, the PERMITTING AUTHORITY shall apply Steps 1-8 of section 1.3 of the SIP, as modified by the following:

For mercury and other bio-accumulative pollutants that are regulated through fish tissue objectives, the REASONABLE POTENTIAL determination shall be based on Step 7 of the SIP, as modified below:

*Step 7:* Replace Step 7 with the following: "Information that may be used to aid in determining if a water quality-based effluent limitation is required includes (but is not limited to): the facility type, the discharge type, mass loading analysis which evaluates the relative contribution of the discharge in comparison to other sources, assessment of the effect of reductions of the discharge loading to attainment of the water quality or fish tissue objective, demonstration of the application of best practices of pollution prevention and industrial pretreatment, presence or lack of dilution, history of compliance problems, potential toxic impact of discharge, fish tissue residue data, existing water quality and beneficial uses of receiving water, CWA 303(d) listing for the pollutant, the presence of endangered or threatened species or critical habitat, and other relevant information. Where a TMDL has been adopted, approved by SWRCB and EPA, and is being implemented, that information should be given special consideration in the determination of the need for a water quality-based effluent limitation for the discharge in question. If data or other information needed to complete the above evaluation is unavailable or insufficient, as described in Section 1.2, to determine ~~o~~if a water quality-based effluent limitation is required, proceed with Step 8."

~~*Step 1*: Replace Step 1 of the SIP with the following: Identify the applicable water column concentration (C) for the lowest (most stringent) mercury water quality objective applicable to the receiving water in accordance with Chapter IV.D.2.b.~~

~~*Step 3*: Replace Step 3 of the SIP with the following: Determine the mercury concentration for the effluent using the highest observed annual average effluent mercury concentration. The annual average shall be calculated as an arithmetic mean. For any sample reported as below the detection limit, one half of the detection limit shall~~

~~be used to calculate the arithmetic mean. For any sample reported as below the quantitation limit and above the detection limit, the estimated concentration shall be used to calculate the arithmetic mean. The annual average concentration is used to account for the long-term nature of the methylmercury bioaccumulation process, which may not otherwise be reflected using the maximum concentration as required by the SIP.~~

~~*Step 4*: Apply as set forth in the SIP, but utilize the annual average mercury concentration from Step 3 (rather than an MEC) to compare to the C from Step 1.~~

~~*Step 5*: Apply as set forth in the SIP, but replace the determination of the "maximum" ambient background concentration for mercury (denoted as B in the SIP), with the highest observed annual average ambient background. The annual average shall be calculated as an arithmetic mean as described in Section 1.4.3.2 of the SIP.~~

2) Calculation of the Effluent Limitations

If, upon the completion of applying the REASONABLE POTENTIAL analysis set forth in Chapter IV.D.2.c.1, the PERMITTING AUTHORITY does not exempt certain discharges from some or all of the provisions of Chapter IV.D.2 under this Chapter, but determines that a water quality based effluent limitation is required for mercury or other bio-accumulative pollutants that are regulated through fish tissue objectives, then the

18 See U.S. EPA, Water Quality Criteria for the Protection of Human Health: Methylmercury (EPA-823-R-01- 001, Jan. 2001), app. A, pp. A-19 to A-25 (describes the chemical translators and provides national translators to convert form methylmercury to total mercury).

PERMITTING AUTHORITY shall calculate the effluent limitation as follows: ~~by applying section 1.4 of the SIP.~~

Replace Part A of section 1.4 of the SIP with the following:

“A. If a TMDL is in effect for mercury ~~(~~or other bio-accumulative pollutant~~)~~, retain the water quality-based effluent limitation at the existing wasteload allocation (WLA) in the existing TMDL until an amended TMDL is adopted and approved. Upon adoption and approval of an amended ~~new~~ TMDL associated with new ~~mercury~~ water quality objectives ~~(~~for mercury or other bio-accumulative pollutants ~~objectives)~~, adjust the water quality-based effluent limitation to be consistent with the WLAs specified in the ~~new~~amended TMDL.

If a TMDL is not in effect for mercury ~~(~~or other bio-accumulative pollutants~~)~~, set an interim performance-based effluent limitation pending development of a ~~pending or future~~ TMDL for such bio-accumulative pollutants. Also, establish NPDES permit requirements to: (1) ensure implementation of best practices for pollution prevention and industrial pretreatment, (2) require participation in the development of the TMDL, and (3) require participation in a stakeholder effort to identify control measures on the major sources impacting the levels of mercury or other bio-accumulative pollutants in fish tissue in the receiving waters of the discharge.”

~~If part B of section 1.4 of the SIP applies, the PERMITTING AUTHORITY shall apply Steps 1-7 contained in part B of the SIP as modified by the following:~~

~~*Step 1:* Replace Step 1 of the SIP with the following: Use the same value for C as used for the REASONABLE POTENTIAL analysis in Chapter IV.D.2.c.1, Step 1, rather than the applicable fish tissue mercury water quality objective. If data are insufficient to calculate the effluent limitation, the RWQCB shall establish interim requirements in accordance with section 2.2.2 of the SIP.~~

~~*Step 2:* Apply as set forth in the SIP, except the ambient background concentration (referred to as B in the SIP) shall be calculated as an arithmetic mean as described in Section 1.4.3.2 of the SIP. Dilution shall be prohibited if the mercury concentration in fish tissue from fish in the receiving water exceeds the applicable MERCURY WATER QUALITY OBJECTIVES.~~

~~*Steps 3-5:* Skip Steps 3-5.~~

~~*Step 6:* Apply as set forth in the SIP but set the effluent limitation as an annual average of total mercury (rather than a monthly average) equal to the effluent concentration allowance (ECA) (from Step 2).~~

~~*Step 7:* Skip Step 7.~~

**Methods, Routine Monitoring, and Compliance Schedules**

1) Methods. For monitoring total mercury in effluent, the discharger shall use any U.S. EPA-approved method that has a quantitation limit lower than the effluent limitation. For

monitoring receiving water, the discharger shall use any U.S. EPA-approved method that has a quantitation limit lower than 0.5 ng/L for total mercury, and lower than 0.06 ng/L for methylmercury.

2) Routine Monitoring. The following are the minimum monitoring requirements for dischargers assigned an effluent limitation, but the PERMITTING AUTHORITY may require dischargers to conduct additional monitoring. The rationale for requiring additional mercury monitoring must be documented in the NPDES fact sheet or equivalent document.
    i. Dischargers with mercury effluent limitations that are authorized to discharge at a rate equal to or greater than five million gallons per day are required to conduct routine total mercury monitoring in the effluent at a frequency no less than once each CALENDAR QUARTER for the duration of the permit.
    ii. Dischargers with mercury effluent limitations that are authorized to discharge at a rate less than five million gallons per day are required to conduct routine total mercury monitoring in the effluent at a frequency no less than once each year for the duration of the permit.
    iii. Dischargers without mercury effluent limitations are required to conduct total mercury monitoring in the effluent at a frequency of no less than once per permit cycle.

3) Compliance Determination. The annual average mercury concentration in the effluent shall be calculated as an arithmetic mean. For any sample reported as below the detection limit, one half of the detection limit shall be used to calculate the arithmetic mean. For any sample reported as below the quantitation limit and above the detection limit, the estimated concentration shall be used to calculate the arithmetic mean.
4) Compliance Schedule. The PERMITTING AUTHORITY may include a compliance schedule in NPDES permits to achieve the mercury effluent limitation in accordance with the Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits (State Water Board Resolution No. 2008-0025).

**Exceptions to the Reasonable Potential Analysis**

1) Small Disadvantaged Communities. The PERMITTING AUTHORITY is authorized to exempt POTWs only serving SMALL DISADVANTAGED COMMUNITIES from some or all of the provisions of Chapter IV.D.2.c if the PERMITTING AUTHORITY makes a finding that the discharge will have no REASONABLE POTENTIAL with respect the applicable MERCURY WATER QUALITY OBJECTIVES. For POTWs only serving SMALL DISADVANTAGED COMMUNITIES that do not have an effluent discharge prior to permit issuance or renewal that is representative of the quality of the proposed discharge, the PERMITTING AUTHORITY is authorized to make this determination and exempt the POTW only after the first year of effluent discharge.
If exempt, the PERMITTING AUTHORITY shall have the discretion to assign routine monitoring as necessary. Routine monitoring schedules for POTWs only serving SMALL DISADVANTAGED COMMUNITIES shall not exceed the applicable frequency specified in Chapter IV.D.2.d.2 for the discharger's authorized rate of discharge.

2) Insignificant Discharges. The PERMITTING AUTHORITY is authorized to exempt certain dischargers from some or all of the provisions of Chapter IV.D.2 if the PERMITTING AUTHORITY makes a finding that the discharge will have no REASONABLE POTENTIAL with respect to the applicable MERCURY WATER QUALITY OBJECTIVES.
If exempt, the PERMITTING AUTHORITY shall have the discretion to assign routine monitoring as necessary. Routine monitoring schedules for INSIGNIFICANT DISCHARGES shall not exceed the applicable frequency specified in Chapter IV.D.2.d.2 for the discharger's authorized rate of discharge.
If determined to be exempt, nothing in this provision shall affect any obligation or requirements otherwise imposed by the PERMITTING AUTHORITY in duly adopted permits issued by the PERMITTING AUTHORITY.

## Storm Water Discharges

### d. Applicability

Chapter IV.D.3 applies to storm water dischargers regulated under general and individual NPDES STORM WATER permits issued pursuant to Clean Water Act section 402, subsection (p). The PERMITTING AUTHORITY shall include the requirements in Chapter IV.D.3.b in individual and general NPDES STORM WATER permits when adopting or re-issuing the permits.

### e. Municipal Separate Storm Sewer Systems

1) Phase I and Phase II MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) permits shall include a combination of the following mercury pollution prevention and pollution control measures to reduce total mercury or methylmercury discharges:[19] All of the following control measures are required, except, at the discretion of the PERMITTING AUTHORITY, additional measure(s) may be substituted for one or more measures if the substituted measure(s) would provide an equivalent level of control or prevent total mercury or methylmercury pollution. If the PERMITTING AUTHORITY substitutes other measures, the justification shall be documented in the permit fact sheet or equivalent document. The effort involved in each of the required measures shall be proportional to the size and population of the MS4.
   i. Thermometer exchange programs and fluorescent lamp recycling programs, or enhancement of household hazardous waste collection programs to better address mercury-containing waste products (potentially including thermometers and other gauges, batteries, fluorescent and other lamps, switches, relays, sensors and thermostats).
   ii. Public education and outreach on disposal of household mercury-containing products and use of non-mercury containing alternatives.
   iii. Education of auto dismantlers on how to remove, store, and dispose of mercury switches in autos.
   iv. Survey of use, handling, and disposal of mercury-containing products used by the MS4 discharger agencies and development of a policy and time schedule for eliminating the use of mercury containing products by the discharger.
2) The PERMITTING AUTHORITY may include best management practices to control erosion in MS4 permits. However, the MS4 permit shall contain best management practices for AREAS WITH ELEVATED MERCURY CONCENTRATIONS.

**f. Industrial Activities**

Upon reissuance, the State Water Board shall revise the existing Numeric Action Level (NAL) for total mercury in the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities (Industrial General Permit) from 1400 ng/L to 300 ng/L or lower.

### Mine Site Remediation

The PERMITTING AUTHORITY shall require dischargers to implement erosion and sediment control measures to prevent or control mercury in discharges when adopting, re-issuing, or modifying WDRs or waivers of WDRs for dischargers subject to the requirements of Title 27 of the California Code of Regulations, section 22510 (closure and post-closure of mining sites), from land where mercury was mined or mercury was used during ore processing.

### Nonpoint Source Discharges

The PERMITTING AUTHORITY has discretion under existing law to require dischargers to implement erosion and sediment control measures in WDRs or waivers of WDRs, and should

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[19] On the effective date of the MERCURY WATER QUALITY OBJECTIVES, the Phase I and Phase II MS4 permits require pollution prevention and control measures (but not explicitly for mercury), which already may encompass one or more actions identified in Chapter IV.D.3.b.

consider requiring such measures in AREAS WITH ELEVATED MERCURY CONCENTRATIONS when adopting, re-issuing, or modifying a WDRs or waiver of WDRs.

### Dredging Activities

The PERMITTING AUTHORITY has discretion under existing law to require dischargers to implement total mercury monitoring and procedures to control the disturbance and discharge of mercury-contaminated material during dredging and disposal of dredged material, and should consider requiring such measures in AREAS WITH ELEVATED MERCURY CONCENTRATIONS when adopting, re-issuing, or modifying a water quality certification, WDRs, or waiver of WDRs.

### Wetland Projects

The PERMITTING AUTHORITY has discretion under existing law to require project applicants that establish (create) or restore wetlands to include design features or management measures to reduce the production of methylmercury in the wetland, including minimizing the wetting and drying of soil by keeping the wetland flooded and sediment control measures to reduce the transport of total mercury or methylmercury out of the wetland, and should consider requiring such measures in AREAS WITH ELEVATED MERCURY CONCENTRATIONS, when adopting, re-issuing, or modifying water quality certifications, WDRs, or waivers of WDRs.

# 3. Attachment A. Glossary

AREAS WITH ELEVATED MERCURY CONCENTRATIONS: Areas with elevated mercury concentrations include the following areas:

1) Areas located in the Coast Range mountains with naturally mercury-enriched soil or sediments with total mercury concentrations of 1 mg/kg or higher;
2) Areas located in an industrial area with soil or sediments with total mercury concentrations of 1 mg/kg or higher;
3) Areas located within historic mercury, silver, or gold mine tailings;
4) Areas located within historic hydraulic gold mining pits in the Sierra Nevada mountain range.
5) Any other area(s) determined by the PERMITTING AUTHORITY in the applicable order.

BIOACCUMULATION: A process in which an organism's body burden of a pollutant exceeds that of its surrounding environment as a result of chemical uptake through all routes of chemical exposure: dietary and dermal absorption and transport across the respiratory surface.

BIOACCUMULATION FACTOR: The ratio of the concentration of a contaminant in the tissue of the organism to the concentration of the contaminant in the surrounding ambient water (see BIOACCUMULATION). A bioaccumulation factor (BAF) can be used to estimate the concentration of the chemical in water ($C_{water}$) that corresponds to concentration of chemical in fish tissue ($C_{tissue}$) using the following equation:

$$\mathrm{BAF} = \frac{C_{tissue}}{C_{water}}$$

CALENDAR QUARTER: A period of time defined as three successive calendar months.

CALIFORNIA NATIVE AMERICAN TRIBE: A federally-recognized California tribal government listed on the most recent notice of the Federal Register or a non-federally recognized California tribal government on the California Tribal Consultation List maintained by the California Native American Heritage Commission.

HIGHEST TROPHIC LEVEL FISH: Either TROPHIC LEVEL 3 or TROPHIC LEVEL 4 fish, whichever is the highest trophic level in the water body that is caught during monitoring, assessment, or other studies, that meet applicable quality assurance requirements.

INSIGNIFICANT DISCHARGES: NPDES discharges that are determined to be a very low threat to water quality by the PERMITTING AUTHORITY.

LEGAL SIZE LIMIT: The size limits of fish species for recreational fishing, established by title 14, California Code of Regulations sections 5.00 through 5.95.

LIFEWAYS: Any customs, practices, or art of a CALIFORNIA NATIVE AMERICAN TRIBE.

MERCURY WATER QUALITY OBJECTIVES: The fish tissue mercury water quality objectives set forth in Chapter III.D.2.

MERCURY PROVISIONS: The MERCURY WATER QUALITY OBJECTIVES and the implementation of those water quality objectives contained in Chapters III and IV, respectively.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4s): Same meaning as set forth in 40 Code of Federal Regulations, section 122.26(b)(8).

PERMITTING AUTHORITY: The State Water Board or Regional Water Board, whichever issues the permit or water quality certification.

PUBLICLY OWNED TREATMENT WORKS (POTWs): Facilities owned by a state or municipality that store, treat, recycle, and reclaim municipal sewage or industrial wastes of a liquid nature.

REASONABLE POTENTIAL: A designation used for a waste discharge that is projected or calculated to cause or contribute to an excursion above a water quality standard.

SMALL DISADVANTAGED COMMUNITIES: Municipalities with populations of 20,000 persons or less, or a reasonably isolated and divisible segment of a larger municipality encompassing 20,000 persons or less, with an annual median household income that is less than 80 percent of the statewide annual median household income.

STORM WATER: Same meaning as set forth in 40 Code of Federal Regulations section 122.26(b)(13).

TROPHIC LEVEL 3 FISH (TL3): Fish that consume mainly zooplankton, benthic invertebrates, and small, phytoplankton-dependent fish. Species include rainbow and brook trout, blue gill, sunfishes, suckers, and bullhead. Examples are shown in Attachment C.

TROPHIC LEVEL 4 FISH (TL4): Fish that consume TROPHIC LEVEL 3 fish and other aquatic organisms. Species include largemouth, smallmouth, spotted, and striped bass; brown and lake trout; catfish, and Sacramento pikeminnow. Examples are shown in Attachment C.

WET WEIGHT*:* Wet weight is part of the format for expressing the concentration of methylmercury in fish tissue. The mercury water quality objectives are expressed as a mass of methylmercury per mass of fresh or “wet” fish tissue. Concentrations expressed as methylmercury in dry weight of fish are not equivalent and must be converted to concentration on a wet weight basis if being compared with the objectives and targets.

# 4. Attachment B. Mercury Prey Fish Decision Diagram

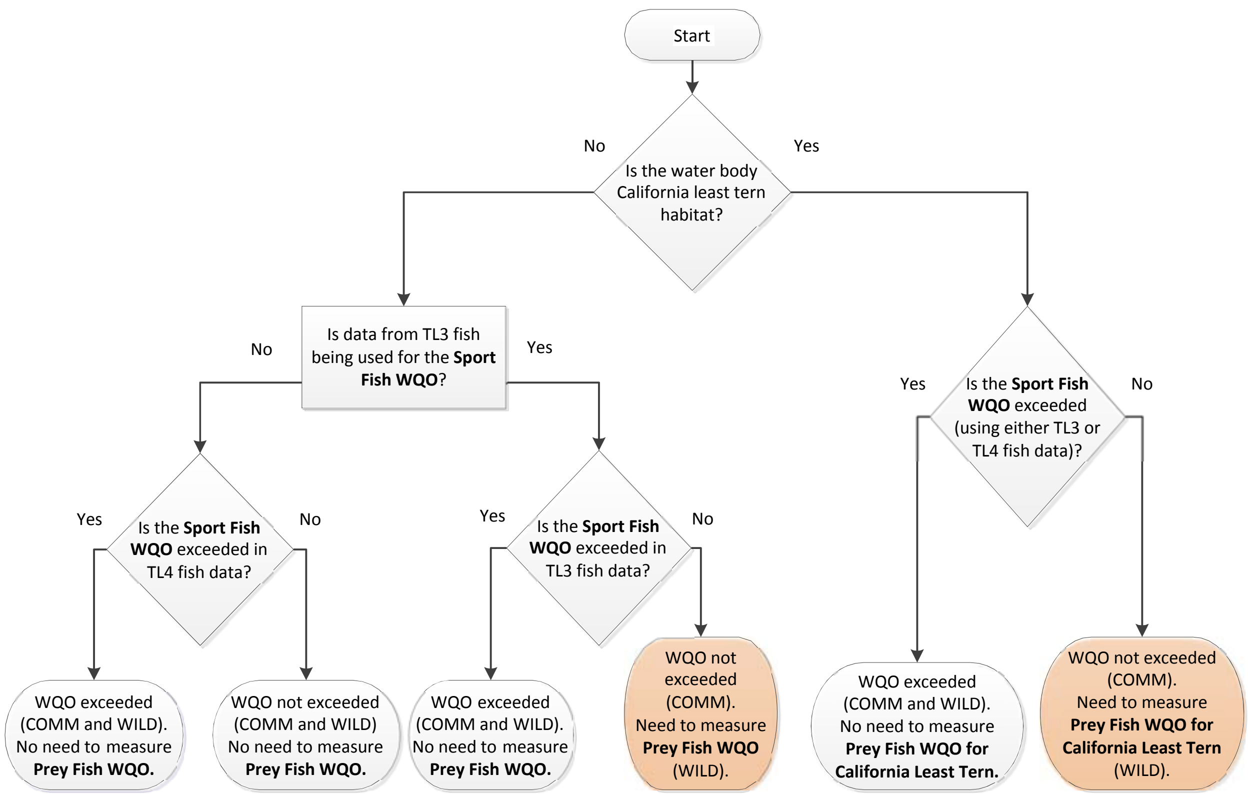


**Figure B-1. Determining the need for application of mercury prey fish water quality objectives.**

In some water bodies, the Sport Fish Water Quality Objective will not be sufficient to ensure wildlife beneficial uses are protected and one of the prey fish objectives needs to be measured (orange ovals, see also Chapter III.D.2.a.1). This decision depends on whether data from TROPHIC LEVEL 3 (TL3) or TROPHIC LEVEL 4 (TL4) fish are used and other factors as shown in the diagram. The wildlife-related beneficial uses are noted as WILD (Wildlife Habitat) in this diagram, but the applicable use may be Marine Habitat (MAR) or others. The Sport Fish Water Quality Objective protects beneficial use of Commercial and Sport Fishing (COMM) as well as Tribal Tradition and Culture (CUL) and wildlife beneficial uses.  See Chapter III.D.2 for full details.

# 5. Attachment C. Fish Trophic Level Classifications

Table C-1 and Table C-2 show trophic level classifications for common species and sizes for comparison with the Sport Fish Water Quality Objective, the Tribal Subsistence Fishing Water Quality Objective, and the Subsistence Fishing Water Quality Objective. These tables do not include all possible species.

**Table C-1. Freshwater trophic level classifications**

| Freshwater Fish Trophic Levels | |
|---|---|
| **TROPHIC LEVEL 4**<br><br>**Unless other size is noted, fish must be within the LEGAL SIZE LIMIT and 200 to 500 mm total length** | **TROPHIC LEVEL 3**<br><br>**Unless other size is noted, fish must be within the LEGAL SIZE LIMIT and 150 to 500 mm total length** |
| Black Crappie | Black Bullhead |
| Brown Trout | Bluegill |
| Channel Catfish | Brook trout |
| Lake Trout | Brown Bullhead |
| Largemouth Bass | Chinook salmon* |
| Sacramento Pikeminnow | Common Carp |
| Smallmouth Bass | Crayfish (> 30 mm) |
| Spotted Bass | Kokanee |
| Striped Bass | Pumpkinseed |
| White Catfish | Rainbow Trout |
| White sturgeon* | Redear Sunfish |
| | Sacramento Sucker |
| | Tule Perch |
| *Acceptable if longer than 500 mm, as long as within the LEGAL SIZE LIMIT | |

**Table C-2. Marine and estuarine trophic level classifications**

| Marine/Estuarine Fish Trophic Levels | |
|---|---|
| **TROPHIC LEVEL 4**<br><br>**Unless size is noted, fish must be within the LEGAL SIZE LIMIT longer than 150 mm total length** | **TROPHIC LEVEL 3**<br><br>**Unless size is noted, fish must be within the LEGAL SIZE LIMIT and longer than 150 mm total length** |
| Barred Sand Bass* | Black Perch |
| Gopher Rockfish*, and various other rockfish*, except Blue Rockfish | Blue Rockfish* |
| Kelp Bass* | Chub Mackerel |
| Leopard Shark | Opaleye |
| Spotted Sand Bass* | Pile Perch |
| Striped Bass | Rainbow Surfperch |
| Yellowfin Croaker* | Striped Mullet |
| | Shiner Surfperch |
| *Basses (Serranidae), Rockfish (Sebastidae), and Croaker (Sciaenidae) shall be within the LEGAL SIZE LIMIT and 150 to 500 mm total length for comparison with Sport Fish Water Quality Objective | |

# 6. Attachment D. Waters Protected by the Mercury California Least Tern Prey Fish Water Quality Objective

**Table B-1. Applicable waters for the California Least Tern Prey Fish Water Quality Objective**

| RB* | MA** | County | U.S. FWS Site Name | Applicable Inland Surfaces Waters, Enclosed Bays and Estuaries |
|---|---|---|---|---|
| 2 | A | Alameda | Alameda Naval Air Station | A water quality objective that is protective of California least tern has already been adopted for Lower San Francisco Bay |
| | | Alameda | Alvarado Salt Ponds | |
| | | Alameda | Oakland Airport | |
| | | San Mateo | Bair Island | Bair Island Marsh |
| 3 | B | San Luis Obispo | Pismo Beach | Pismo Creek Estuary, Pismo Creek, Arroyo Grande Estuary, Arroyo Grande Creek, downstream (Oceano Lagoon, Meadow Creek, Pismo Marsh (Lake), Los Berros Creek), Big Pocket Lakes (Dune Lakes) |
| | | San Luis Obispo | Oso Flaco Lake | Oso Flaco Lake, Oso Flaco Creek |
| 3 | C | Santa Barbara | Santa Maria River | Santa Maria Estuary, Santa Maria River (except Corralitos Canyon Creek, Sisquoc River, downstream), Orcutt Creek |
| 3 | D | Santa Barbara | San Antonio Creek | San Antonio Creek, San Antonio Creek Estuary |
| | | Santa Barbara | Purisima Point (North, South) | None (only ocean waters) |
| | | Santa Barbara | Santa Ynez River | Santa Ynez River Estuary, Santa Ynez River, downstream |
| 4 | E | Ventura | Santa Clara River | Santa Clara River Estuary, Santa Clara River Reach 1, |
| 4 | F | Ventura | Ormond Beach | Ormond Beach Wetlands |
| | | Ventura | Mugu Lagoon | Calleguags Creek Reach 1 (also called Mugu Lagoon) |
| 4 | G | Los Angeles | Venice Beach | Ballona lagoon, Marina Del Rey (except Harbor), |
| | | Los Angeles | Playa del Rey | Ballona Wetlands, Ballona Creek Estuary |
| 4 | H | Los Angeles | Terminal Island | Los Angeles/Long Beach Inner Harbor, Los Angeles/Long Beach Outer Harbor |
| | | Los Angeles | San Gabriel River | Alamitos Bay: Los Cerritos Wetlands, San Gabriel Estuary, Los Cerritos Channel Estuary, Long Beach Marina |
| 4 | I | Los Angeles | Cerritos Lagoon | |
| | | Los Angeles | Costa Del Sol | |
| 8 | J | Orange | Anaheim Bay | Anaheim Bay |
| | | Orange | Surfside Beach | Anaheim Bay |
| 8 | K | Orange | Bolsa Chica (North, South) | Bolsa Bay, Bolsa Chica Ecological Reserve |
| 8 | L | Orange | Huntington Beach | Santa Ana River Salt Marsh, Tidal Prism of Santa Ana River (to within 1000' of Victoria Street) and Newport Slough |
| 8 | M | Orange | Upper Newport Bay | Upper Newport Bay |

**Table B-1. Applicable waters for the California Least Tern Prey Fish Water Quality Objective**

| RB* | MA** | County | U.S. FWS Site Name | Applicable Inland Surfaces Waters, Enclosed Bays and Estuaries |
|---|---|---|---|---|
| 9 | N | San Diego | San Mateo Creek | San Mateo Creek Mouth |
| | | San Diego | Aliso Creek | Aliso Canyon (in San Onofre Creek Watershed. Not in Orange County) |
| | | San Diego | Santa Margarita River | Santa Margarita Lagoon |
| 9 | O | San Diego | Buena Vista Lagoon | Buena Vista Creek |
| 9 | P | San Diego | Agua Hedionda Lagoon | Agua Hedionda Lagoon |
| 9 | Q | San Diego | Batiquitos Lagoon | Batiquitos Lagoon |
| 9 | R | San Diego | San Elijo Lagoon | San Elijo Lagoon |
| 9 | S | San Diego | San Dieguito Lagoon | San Dieguito Lagoon |
| | | San Diego | Whispering Palms Encinitas | None (no longer suitable habitat) |
| 9 | T | San Diego | Los Penasquitos Lagoon | Los Penasquitos Lagoon |
| 9 | U | San Diego | FAA Island | Mission Bay |
| | | San Diego | North Fiesta Island | Mission Bay |
| | | San Diego | Stony Point | Mission Bay |
| | | San Diego | South Sea World Drive | Mission Bay, San Diego River Estuary |
| | | San Diego | Clover Leaf | Mission Bay, San Diego River Estuary |
| 9 | V | San Diego | Naval Training Center | San Diego Bay |
| | | San Diego | San Diego Int. Airport | San Diego Bay |
| | | San Diego | Chula Vista Wildlife Reserve | San Diego Bay |
| | | San Diego | Sweetwater River | Sweetwater River, Hydrologic Unit Basin Number 9.21, San Diego Bay |
| | | San Diego | North Island | San Diego Bay |
| | | San Diego | Delta Beach | San Diego Bay |
| | | San Diego | Coronado Cays | San Diego Bay |
| | | San Diego | Saltworks | San Diego Bay |
| 9 | W | San Diego | Tijuana River Mouth | Tijuana River Estuary |

* Regional Water Quality Control Board
**US FWS California least tern coastal management areas (US FWS 2006).

# ATTACHMENT C

**Attachment C**

**Proposed language for SWRCB Adoption Resolution – Guidance to Regional Water Boards regarding Adoption and Implementation of Proposed Beneficial Uses for Tribal & Subsistence Fishing and Implementation of Mercury Water Quality Objectives**

Whereas…

x-5. The State Water Board recognizes that the Regional Water Boards and dischargers have developed substantial technical and analytical data about various priority toxic pollutants for certain water bodies in California since the initial adoption of the SIP in 2000. Much of this information has led to the development of TMDLs for priority toxic pollutants in various regions, such as the San Francisco Bay Mercury TMDL (2006); Calleguas Creek/Mugu Lagoon Mercury TMDL (2007); Guadalupe River Watershed Mercury TMDL (2008); Walker Creek Mercury TMDL (2008); Cache Creek Mercury TMDL (2004); Sacramento-San Joaquin Delta MethylMercury TMDL (2010); and Los Angeles-Long Beach Harbor Mercury TMDL (2011).

x-6. Much of the information and technical analyses developed about the sources and impacts of priority pollutants developed by Regional Water Boards and dischargers demonstrate that, in many impaired water bodies, municipal and industrial point sources regulated via NPDES permits issued by Regional Boards are an inconsequential, or *de minimis*, source of certain priority toxic pollutants. In the case of ongoing mercury loading to certain water bodies, the *de minimis* nature of these point source contributions can be traced to aggressive pre-treatment, pollution prevention, and active treatment technologies imposed over the past two decades. Indeed, municipal and industrial dischargers combined account for less than 1.4% of the ongoing mercury loading to San Francisco Bay. Planned NPDES loads to the Delta (based on current permit requirements) will represent less than 0.1% of the methylmercury load in 2030.

x-7. By comparison, open water, tributaries and existing wetlands are known to account for about 93.8% of ongoing mercury loading in the Delta, predominantly from legacy loads. In San Francisco Bay, over 75% of the continued loading of mercury is coming from the Central Valley watershed, natural bed erosion, and atmospheric deposition. In both instances, the Regional Boards have struggled to find effective means of controlling these “untethered” sources of most of the mercury continuing to be taken-up by fish and other biota in the waters.

In 2010, the Central Valley Regional Board took the unprecedented step of assigning responsibility for open water and tributary sources of mercury to those State of California and federal agencies responsible for managing the land and water from which these mercury loads are derived. In its 2010 Delta Methylmercury TMDL, the Central Valley Regional Board specifically found that transportation and deposition of mercury-contaminated sediment from water management activities contribute to the Delta fish mercury impairment.

Specifically, the Central Valley Regional Board determined that the State and Federal Water Projects affect the transportation of mercury and the production and transportation of methylmercury. Activities including water management and storage in and upstream of the Delta and Yolo Bypass, maintenance of and changes to salinity objectives, dredging and dredge materials disposal and reuse, and management of flood conveyance flows are subject to the open water methylmercury allocations established in the TMDL. Agencies responsible for these activities in the Delta and Yolo Bypass include, but are not limited to, the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), and State Water Resources Control Board. The Regional Board also determined that the State of California owns and manages lands and waters of the state that contribute to methylmercury loads. As a result, the State Lands Commission and Department of Water Resources were also assigned responsibility for addressing these mercury contributions to the overall fish impairment.

Assigning state and federal agency responsibility for mercury loads coming from historic legacy sources (gold and mercury mining), state and federal lands, or major water projects over which these agencies have responsibility is reasonable, fair, and just. Without doing so, there is literally no hope of successfully abating mercury in fish from some California waters. What's more, holding these state and federal agencies responsible is consistent with existing laws, regulations and authorities of the State and Regional Water Boards. When considering application of the water quality objectives adopted [in this action] and implementing control strategies to achieve those objectives, the Regional Boards are directed to consider all available information regarding sources and contributions of mercury to a given water body and, where appropriate, assign responsibility for mercury and abatement control strategies (including any appropriate risk reduction and communication actions) to those State of California and federal agencies responsible for managing land and water from which these mercury contributions are derived.

***[These provisions apply to our request for future guidance from the State Board to Regional Boards when adopting the beneficial uses and applying the water quality objectives.]***

x-8. The State Board directs its staff, working with the Regional Water Boards and interested stakeholders, to develop guidance for the Regional Water Boards when formally designating waters in their respective regions for T-CUL, T-SUB and SUB beneficial uses that address, without limitation, the following topics:

- Prior to designating waters for T-CUL, T-SUB and SUB beneficial uses, or implementing water quality objectives for such designated waters, Regional Boards shall identify and evaluate all known or suspected sources of priority toxic pollutants. This analysis should consider traditional point sources, non-point sources, aerial deposition, open water, historical or "legacy" sources, and any other reasonably discernable sources of the priority toxic polluants.

- To the maximum extent possible, all relevant information developed for TMDLs, site specific objectives, use attainability analyses, or other regulatory actions shall be utilized by Regional Boards in designating waters for T-CUL, T-SUB and SUB beneficial uses, or implementing water quality objectives for such designated waters.

- When determining whether and to what extent to designate waters for T-CUL, T-SUB and SUB beneficial uses, or implementing water quality objectives for such designated waters, Regional Boards shall consider all available information relevant to ascertaining the geographic extent to which such waters are used for these beneficial uses.

- When determining site specific water quality objectives to protect T-CUL, T-SUB and SUB beneficial uses based on consumption of fish or aquatic-dependent wildlife, the Regional Boards should develop, through a publicly-noticed process, appropriate protocols for determining consumption patterns (*i.e.*, types of fish consumed, volumes of each fish consumed, frequency of consumption, etc.) relative to those waters (or sub-portions of waters) for which T-CUL, T-SUB and SUB beneficial uses have been designated.

- Regional Boards should convene working groups of key stakeholders (*e.g.*, Tribes, subsistence fishing community, regulated community, State of California, federal agencies that own or have responsibility for land or water projects that are a known or suspected source of priority toxic pollutants) to address adoption and implementation of water quality objectives for adopted uses. Considerations should include a full range of possible management and control measures, and their relative efficacy in achieving fish tissue targets.

# ATTACHMENT 6

## ELAP Regulations Comments

CWEA's substantive comment letter, submitted October 15, 2016, raised issues similar to those raised by CVCWA, but were more limited in scope, focusing on the following:

- Internal audits and data review requirements mandate multiple lab staff, which may be too expensive for small labs.
- Personnel requirements should include technical certifications as an option to meet personnel qualifications, such as those certifications offered by CWEA.
- Increasing costs related to staffing can lead to labs dropping their ELAP certifications or closing, and other indirect effects such as delayed lab reporting and limited ability to conduct repeat sampling.

CASA's comments submitted before the deadline extension are consistent with CVCWA's comments. These comments noted the following:

- Required staffing increases could exceed small lab budgets, and may result in lab closure.
- Unclear whether all of the onerous requirements would have a meaningful impact on data quality from these labs.
- Requests more stakeholder involvement beyond ELTAC.

# ATTACHMENT 7

March 17, 2017

Felicia Marcus, Chair
Members of the State Water Resources Control Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

SUBJECT: Comment Letter – 2016 Phase I Bay-Delta Plan Amendment and Substitute Environmental Document

Dear Chair Marcus and Members of the Board:

The Central Valley Clean Water Association (CVCWA) appreciates the opportunity to comment on the proposed revisions to the 2016 Phase I Bay-Delta Plan Amendment (Bay-Delta Plan Amendment) and Substitute Environmental Document (SED). CVCWA is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. We approach these matters with the perspective of balancing environmental and economic interests consistent with state and federal law. CVCWA appreciates the opportunity to comment on the 2016 Bay-Delta Plan Amendment and SED, particularly the proposed southern Delta water quality objective for salinity. We hope to continue working with State Water Resources Control Board (State Board) staff to develop alternatives for a truly workable salinity objective in the southern Delta as it applies to publically-owned treatment works (POTWs).

This letter reinforces testimony presented by CVCWA at a panel presentation to State Board members on December 16, 2016, and provides additional comments on the adequacy of the SED under the California Environmental Quality Act (CEQA). As mentioned in CVCWA's testimony, four CVCWA members are located within the southern Delta and are impacted by the proposed salinity objective: the City of Stockton (Stockton), the City of Manteca (Manteca), the City of Tracy (Tracy), and Mountain House Community Services District (Mountain House).

These POTWs and CVCWA are concerned that the current language in the Bay-Delta Plan Amendment Southern Delta Water Quality component proposing an electrical conductivity (EC) objective of 1.0 deciSiemens per meter (dS/m)[1] as a rolling 30-day average will impose costly and unnecessary burdens on POTWs without providing any measurable improvement in salinity in the southern Delta.

CVCWA's main concern is that the proposed southern Delta salinity objective will be interpreted and/or applied as an end-of-pipe effluent limit on POTW discharges of treated wastewater. In fact, the Bay-Delta Plan Amendment contains language that implies that this objective would be imposed as an end-of-pipe limit. (Appendix K, *Revised Water Quality Control Plan*, p. 45-46.) Specifically, the proposed language states that POTWs whose discharges exceed the salinity water quality objective should consider desalinating their effluent, indicating that any discharger with effluent salinity greater than 1.0 dS/m would be out of compliance. (Appendix K, *Revised Water Quality Control Plan*, p. 46; see also SED, p. 13-72.)

The SED also bases its impact analyses for POTWs[2] on the assumption that POTWs would be required to meet 1.0 dS/m as an effluent limitation. (SED, p. 13-70 – 13-72.) Imposing the salinity objective as an end-of-pipe effluent limit is not necessary considering the incredibly small impact POTWs have on salinity concentrations in the southern Delta, especially as compared to the extraordinary costs POTWs would bear in order to meet such an effluent limit. CVCWA proposes that compliance with the salinity objective be measured in-stream, rather than at end-of-pipe, and that other allowances be made in the program of implementation for the salinity objective that ensure POTWs can comply with the objective without requiring unnecessary treatment and its attendant unnecessary costs.

## 1. CVCWA's Recommended Program of Implementation Language

The Bay-Delta Plan Amendment and program of implementation for the proposed southern Delta salinity water quality objective should include the following provisions to ensure that POTWs are regulated in a way that is effective and not overly burdensome. CVCWA has prepared draft language for inclusion in the Bay-Delta Plan Amendments, attached hereto as **Attachment 1**.

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[1] Salinity is measured in the Bay-Delta Plan Amendment in EC units, which can be expressed in either deciSiemens per meter or µmhos per centimeter (1.0 dS/m = 1,000 µmhos/cm)

[2] The SED refers to impacts on POTWs as impacts on "service providers."

- Calculation of Reasonable Potential

  As identified in Attachment 1, CVCWA recommends that the Bay-Delta Plan Amendment instruct the Regional Board to conduct reasonable potential analyses (RPA) for dischargers at the historic compliance locations: San Joaquin River at Airport Way Bridge, Vernalis; San Joaquin River at Brandt Bridge; Old River near Middle River; and Old River at Tracy Road Bridge. This will ensure that available dilution will be considered, as required in 40 C.F.R. § 122.44(d)(1)(ii). CVCWA further recommends that the RPA consider whether the discharge is meaningfully or reasonably causing or contributing to an exceedance of the salinity objective, based on sampling or modeling, even if the discharge itself exceeds the objective. This would examine whether ceasing the discharge would not meaningfully impact downstream receiving water conditions. The Central Valley Regional Water Quality Control Board (Regional Board) should also consider whether existing controls, like agricultural barriers and Department of Water Resources' (DWR) or the U.S. Bureau of Reclamation's water rights, could provide assimilative capacity or dilution.

  Where insufficient data exists to determine reasonable potential, permits should require additional monitoring in the applicable compliance segment. This monitoring could be fulfilled through discharger participation in a regional monitoring program. In the interim, the Regional Board can consider including a performance-based effluent limitation, a salinity evaluation and minimization plan, and/or participation in a program such as CV-SALTS.

- Development of Final Water Quality-Based Effluent Limitations

  CVCWA also recommends that water quality-based effluent limitations be based on mass-based load allocations developed through a watershed loading analysis and facility-specific water quality modeling analysis, akin to the waste load allocation (WLA) [3] process used with total maximum daily loads (TMDLs), as described in U.S. Environmental Protection Agency (USEPA) regulations and NPDES permit guidance. This mass-based load allocation can be developed using any reasonable allocation scheme that meets antidegradation requirements and other California water quality standards. (See USEPA, *Technical Support Document for Water Quality-Based Toxics Control* (1991), p. 69.) Therefore, a mass-based load allocation that requires no additional reduction in point-source loading beyond that achieved through minimization efforts is a reasonable finding, and a performance-based mass limit is appropriate.

[3] WLA is the portion of a receiving water's loading capacity that is allocated to point sources. (40 C.F.R., § 130.2(h).)

A watershed-scale analysis provides information to determine whether further reduction of point source loadings would result in a meaningful—or measurable—change in ambient salinity conditions. Existing facility-specific modeling analyses show that POTW salinity mass loadings do not create significant incremental changes in ambient water quality. Given this minimal impact on ambient salinity conditions, and given the efforts that southern Delta POTWs has made to minimize discharges of salinity, it is reasonable to establish performance-based mass limits that consider and account for conservation and growth as the final water quality-based effluent limitation. NPDES permit provisions accompanying these limits may incorporate continued efforts to minimize salinity mass loadings.

- Water quality-based effluent limitations could also be calculated considering dilution, if the discharger so requests. The discharger would select between a steady-state or a dynamic modeling approach.

- NPDES permits for southern Delta POTWs may also include other provisions to ensure that mass loadings of salinity will not unreasonably increase in the future:

    - Continue efforts to minimize salinity in effluent
    - Participation in the Salinity Management Strategy as described in the Central Valley Salt and Nutrient Management Plan (SNMP), including participation in CV-SALTS' Prioritization and Optimization Study
    - Support for TMDL development to address the 303(d) listing for EC in the South Delta
- Other options for compliance include the ability for a POTW to obtain a salinity variance or time schedule order to come into compliance with any final water quality-based effluent limitation. The Bay-Delta Plan Amendments already indicate that dischargers may qualify for a variance pursuant to the Regional Board Resolution R5-2014-0074, and CVCWA requests that this provision remain in place. However, the Bay-Delta Plan Amendments should also reflect the ability for the Regional Board to grant time schedule orders for POTWs.

CVCWA has discussed much of the foregoing with State Board staff in the development of this comment letter. Staff and the State Board appear to recognize that POTWs should not be required to spend significant public resources when their collective impact is minimal. Further, Water Code sections 13241 and 13242 require that water quality objectives be set at a value "that could reasonably be achieved through *the coordinated control of all factors* which affect water quality in the area." (Wat. Code, § 13241, subd. (c) [emphasis added].) The cost of meeting salinity standards for POTWs is not reasonable.

An additional benefit to the incorporation of these provisions is to lessen the impacts of the 1.0 dS/m salinity objective on POTWs, which were identified as significant and unavoidable in the SED for this project. Presenting other options for POTW compliance with the salinity objective would allow State Board staff to determine that the proposed 1.0 dS/m objective no longer presents a significant and unavoidable impact on POTWs. This will help address some of the SED's deficient analyses identified later in this comment letter.

As presented, the Bay-Delta Plan Amendments' only compliance strategy available to POTWs to consistently achieve salinity effluent limitations is desalination through reverse osmosis processes (RO). (SED, p. 13-70.) Constructing RO facilities impacts POTWs greatly, as noted in the SED. These impacts include: (1) high costs of construction and operation; (2) challenges with brine disposal systems (including cost and transportation until a Central Valley brine line is constructed and operable); (3) increased greenhouse gas (GHG) emissions; and (4) increased energy demand to operate the facilities. Considering the very small impact POTWs have on salinity in the southern Delta, the costs of RO are not justified or reasonable. (See Wat. Code, § 13241.) CVCWA's recommended changes to the Bay-Delta Plan Amendment language will help ensure that limits on POTWs based on water quality objectives are properly justified, considering all required factors in a Water Code section 13241 analysis.

**2. POTWs Have a *De Minimis* Impact on Salinity in the Delta**

CVCWA concurs with the Bay-Delta Plan Amendment in its statement that "Overall, the WWTPs [wastewater treatment plants] have only a small effect on southern Delta salinity." (SED, p. 13-23.) The *de minimis* impact of POTWs on salinity levels in the southern Delta is also acknowledged in the Bay-Delta Plan Amendment through its presentation of conclusions drawn from a DWR modeling study of NPDES discharges performed in 2007 to better understand the salinity impacts of new and expanded discharges from Tracy and Mountain House. The modeling study "concluded that the Tracy discharge under reasonable worst-case conditions has limited impacts on the salinity problem in the southern Delta as compared to other sources of salinity in the area defined as ambient salinity entering from the San Joaquin River, agricultural activities, and groundwater accretions." (Appendix C, *Technical Report of the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, p. 4-10) Furthermore, in a February 2012 mass balance analysis performed by the State Board comparing the maximum permitted salinity loads from the point source discharges of Tracy, Mountain House, and Deuel Vocational Facility to salinity loading entering the Head of Old River, the State Board found "that the salt load from point sources in this part of the southern Delta is a small percentage of the salt load entering from upstream." (Appendix C, *Technical Report of the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, p. 4-11)

CVCWA has performed an analysis similar to the far-field water quality impact analyses conducted for southern Delta POTWs in support of the Central Valley Water Board's Staff Report for *Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity* (CVRWQCB, 2014) (Variance Policy). The Staff Report for the Variance Policy and its supporting technical memorandum are attached as **Attachment 2** and **Attachment 3**, respectively. DWR's Delta Simulation Model 2 (DSM2) results (DWR, 2007) were used with current EC effluent data for the Tracy Wastewater Treatment Plant (WWTP) and Mountain House WWTP to estimate water quality changes in downstream receiving water quality with and without the implementation of RO. CVCWA's analysis uses DWR DSM2 model results to estimate the percent change in ambient EC levels at downstream salinity compliance locations (see **Figure 1**) with Tracy and Mountain House discharging at their current permitted capacities, with and without RO treatment.

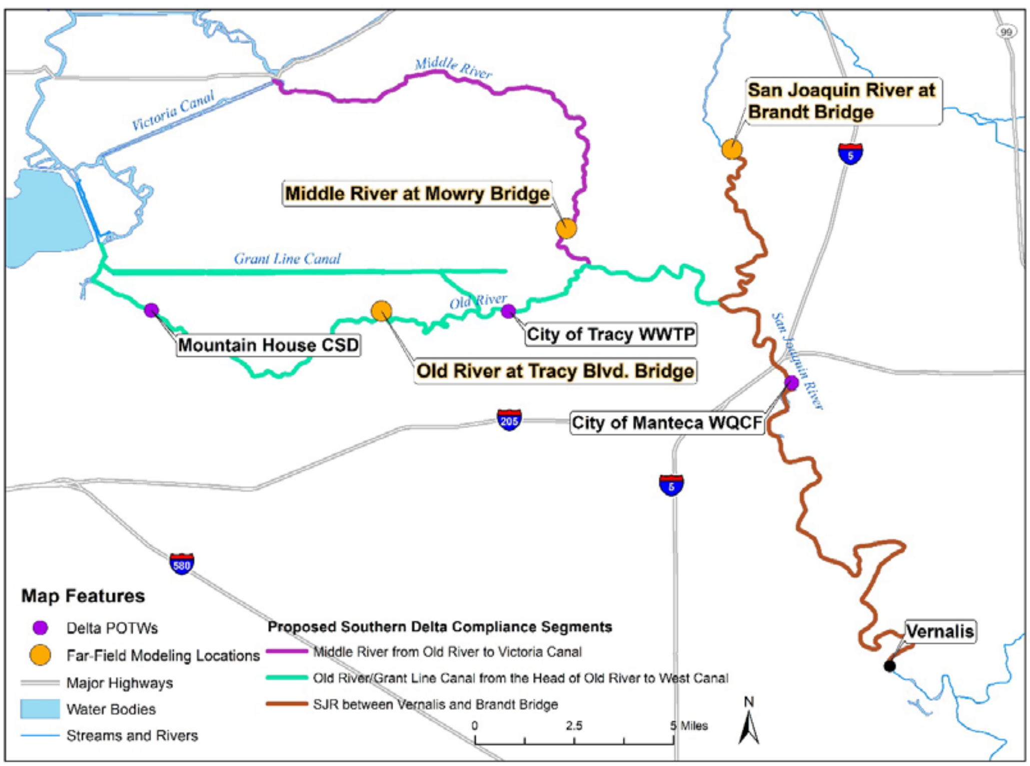


**Figure 1: Southern Delta Area Showing Tracy, Mountain House, and Manteca Discharge Locations in Relation to Far-Field Modeling Locations and Proposed Southern Delta Compliance Segments.**

The DWR DSM2 Model considers both low and high export pumping from the southern Delta and the timing of installation of agricultural barriers (August) and the Head of Old River fish control structure (October). CVCWA's analysis considers both low- and high-export pumping, but focuses on October flow conditions when the volume fraction of POTW effluent is greatest in the southern Delta. The incremental, far-field water quality changes presented in **Table 1** and

**Table 2** demonstrate a *de minimis* influence of POTW discharges on downstream ambient EC levels at the nearest modeling location (Old River at Tracy Road Bridge), and no change (0.00%) in ambient EC concentrations at the two modeling locations farther downstream (Middle River at Mowry Bridge and San Joaquin River at Brandt Bridge). In the case of the Tracy discharge (see **Table 1**), the low Delta export scenario shows a slightly greater estimated percent change in ambient EC (0.98%) at the Old River at Tracy Road Bridge modeling location, as compared to the high Delta export scenario (0.04%). Modeling shows no percentage difference in ambient EC levels is observed between the low- and high-Delta export scenarios developed for the Mountain House WWTP (see **Table 2**).

**Table 1: Summary of DWR DSM2-Modeled, Incremental, Far-Field Water Quality Changes During the Month of October with Implementation of Partial Reverse Osmosis Treatment at the Tracy WWTP and the Granting of a Salinity Variance.**

| | Low Delta Export | | | High Delta Export | | |
|---|---|---|---|---|---|---|
| | Estimated Ambient EC | | | Estimated Ambient EC | | |
| Location (moving downstream) | With RO | Without RO | Est. % EC Change | With RO | Without RO | Est. % EC Change |
| Old River at Tracy Rd. Bridge | 696.6 | 703.6 | 0.98 | 688.4 | 688.7 | 0.04 |
| Middle River at Mowry Bridge | 688.0 | 688.0 | 0.00 | 688.0 | 688.0 | 0.00 |
| SJR at Brandt Bridge | 688.0 | 688.0 | 0.00 | 688.0 | 688.0 | 0.00 |

DSM2 Model input:
Effluent permitted flow: 16 MGD
Current effluent EC level: 1250 µmhos/cm
Current ambient EC level: 688 µmhos/cm
River flows were determined through DWR DSM2 modeling.

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**Table 2: Summary of DWR DSM2-Modeled, Incremental, Far-Field Water Quality Changes During the Month of October with Implementation of Partial Reverse Osmosis Treatment at the Mountain House CSD WWTP and the Granting of a Salinity Variance.**

| | Low Delta Export | | | High Delta Export | | |
|---|---|---|---|---|---|---|
| | Estimated Ambient EC | | Est. % EC Change | Estimated Ambient EC | | Est. % EC Change |
| Location (moving downstream) | With RO | Without RO | | With RO | Without RO | |
| Old River at Tracy Rd. Bridge | 690.7 | 690.9 | 0.04 | 691.2 | 691.5 | 0.04 |
| Middle River at Mowry Bridge | 688.0 | 688.0 | 0.00 | 688.0 | 688.0 | 0.00 |
| SJR at Brandt Bridge | 688.0 | 688.0 | 0.00 | 688.0 | 688.0 | 0.00 |

DSM2 Model input:
Effluent permitted flow: 5.4 MGD
Current effluent EC level: 1029 µmhos/cm
Current ambient EC level: 688 µmhos/cm
River flows were determined through DWR DSM2 modeling.

The estimated percent change in ambient EC levels downstream of the Tracy WWTP under a future scenario "with RO" (where the discharger implements RO to meet the proposed 1.0 dS/m EC objective), in comparison to ambient EC levels estimated to occur downstream of the discharge "without RO" is shown in **Figure 2**. A similar plot of future estimated downstream EC levels "with RO" and "without RO" is shown for the Mountain House WWTP in **Figure 3**. Both figures illustrate the extremely small differences in estimated ambient EC levels downstream of each discharge for a discharge scenario that includes RO treatment.

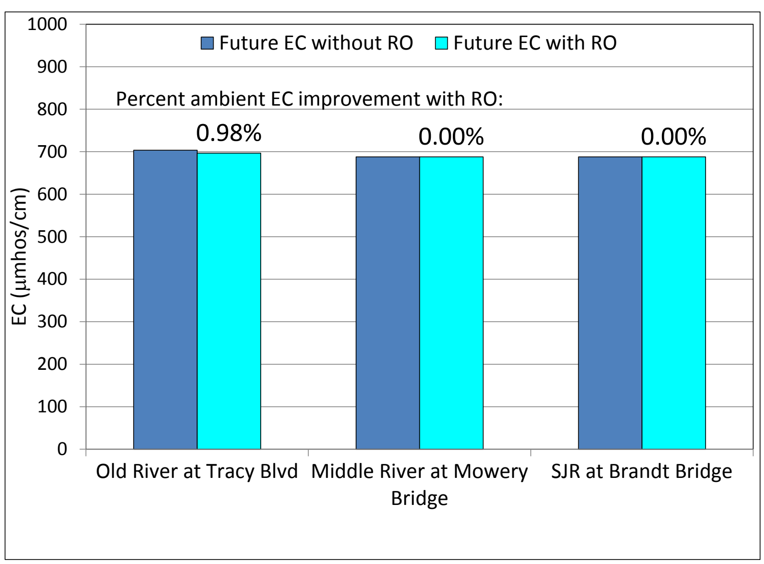


**Figure 2: City of Tracy WWPT Future Incremental Far-Field Water Quality Changes Associated with Implementation of RO Treatment Under Low Delta Export Conditions During the Month of October (Based on DWR DSM2 Modeling).**

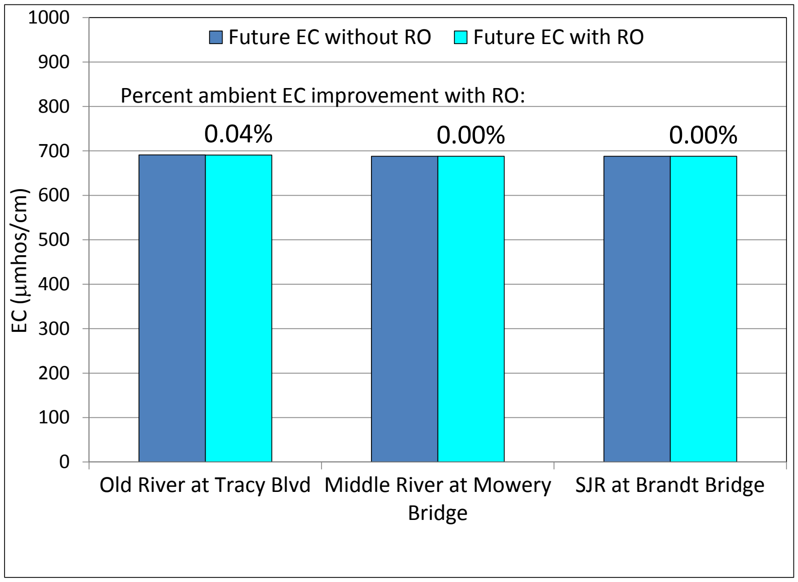


**Figure 3: Mountain House CSD WWTP Future Incremental Far-Field Water Quality Changes Associated with Implementation of RO Treatment Under Low Delta Export Conditions During the Month of October (Based on DWR DSM2 Modeling).**

### 3. Compliance Strategies in SED will not Significantly Reduce Salinity in the Delta

The SED suggests that POTWs have a small number of compliance options which should be implemented as a means to meet a proposed southern Delta salinity water quality objective. The suggested compliance actions include: (1) new source water supplies, (2) salinity pretreatment programs, and (3) desalination (RO). The cities of Tracy, Stockton, and Manteca have all made substantial investments in obtaining significant new source water supplies, implementing salinity source control programs/pretreatment programs, and implementing salinity source control requirements in their existing NPDES permits. These actions have resulted in improvements in EC effluent quality for each discharger; especially, when comparing current EC quality to that measured in the early 2000s. Further improvements are not anticipated, since the actions have already been taken. In the cases of Tracy and Stockton, it should be noted that new source water supplies and salinity control programs have not resulted in the production of a treated effluent that could meet a 1.0 dS/m EC effluent limitation.

**Figure 4** shows EC levels in Tracy WWTP effluent decreasing over time from a peak in 2006 when Tracy obtained a new surface water supply. However, the plot also shows EC levels increasing before and during the recent drought. Annual average EC levels have exceeded 1.2 dS/m for most of the past four years.

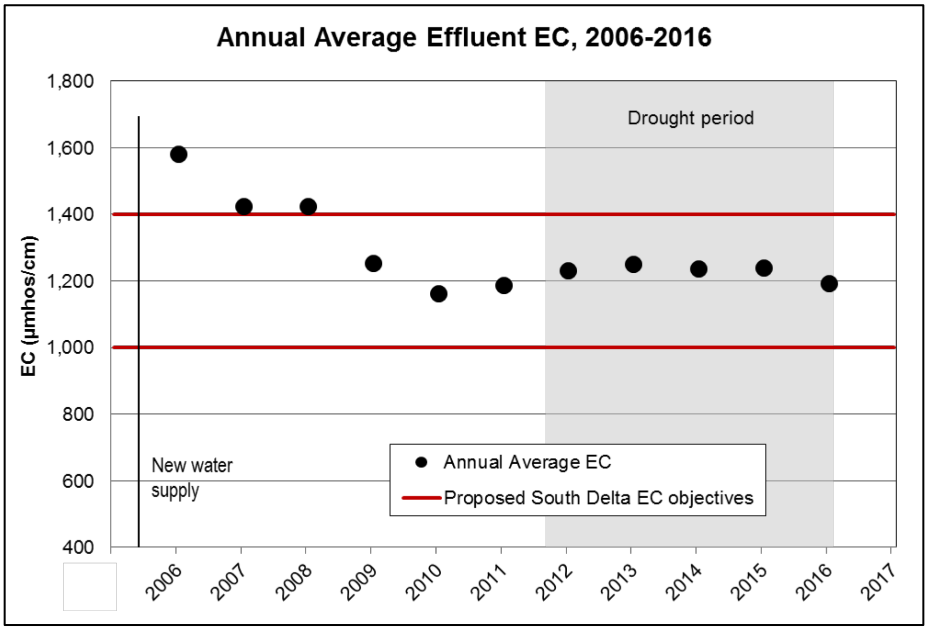


**Figure 4: City of Tracy WWTP Annual Average Effluent EC: 2006 – 2016.**

A similar pattern is observed for the Stockton RWCF as shown in **Figure 5**. As Stockton has obtained new surface water supplies, annual average EC levels in its effluent have decreased, with the exception of a noticeable drought-related increase in EC observed in 2015. Stockton would not be able to meet a 1.0 dS/m EC objective.

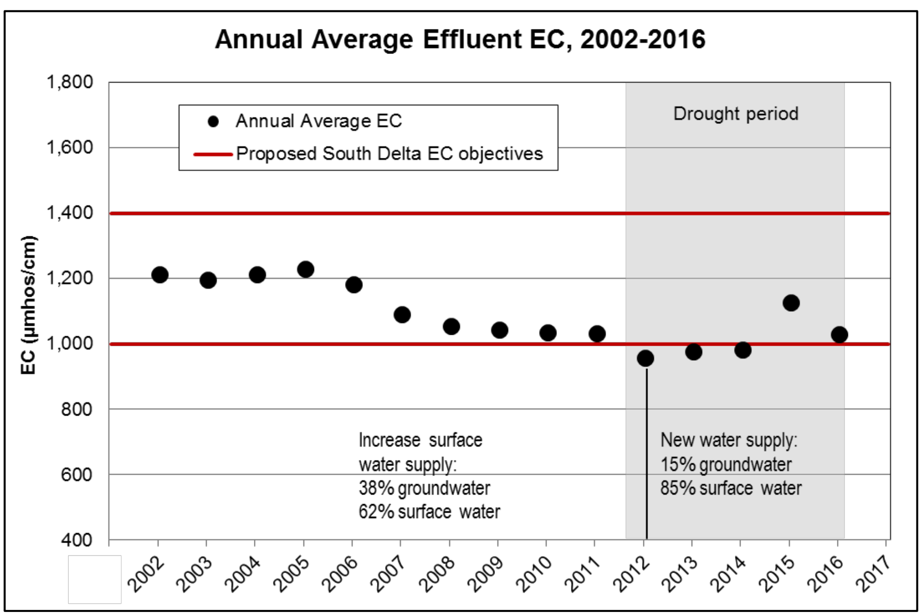


**Figure 5: City of Stockton RWCF Annual Average Effluent EC: 2002 – 2016.**

Manteca obtained a new surface water supply in 2005 that resulted in a significant reduction in the EC of its effluent for several years. However, as shown in **Figure 6Figure 6**, annual average EC levels in Manteca's effluent have slowly increased since 2010. Although Manteca could presently meet a 1.0 dS/m EC objective, it is uncertain if it could do so in the future based on the upward trend in EC levels that has been observed during the recent drought.

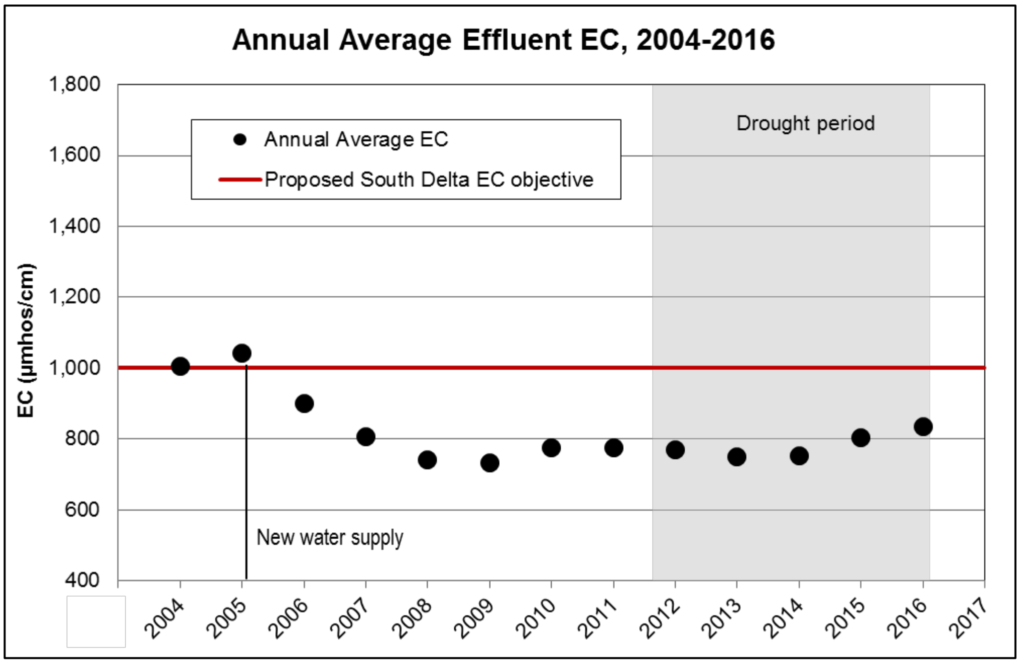


**Figure 6: City of Manteca WQCF Annual Average Effluent EC: 2004 – 2016.**

As mentioned before, southern Delta POTWs have already undertaken numerous salinity minimization activities. The main source control mechanism used by southern Delta POTWs has been the acquisition of new surface water supplies, which has reduced the salt entering the municipal water supply. This, in turn, results in lower-salinity effluent discharges into the southern Delta. Other salinity minimization activities include continued implementation of industrial source control and pretreatment programs that regulate and control salt discharges from industrial users to sanitary sewer systems, as well as outreach and education efforts for residential dischargers regarding the impacts of salt-producing products and practices, such as detergents and other household cleaners, salt-based water softeners, and food processing habits. Together, these activities have helped reduce salinity in POTW discharges to the southern Delta. CVCWA is not opposed to including these compliance mechanisms as options in the Bay-Delta Plan Amendments, but would like recognition that these activities have already been undertaken and that there is little room for improvement beyond current levels through the use of these activities alone.

### 4. Desalination Imposes High Economic and Environmental Costs on POTWs

As stated above, each of the three cities has expended significant resources to improve the quality of their source water supplies over the past two decades, in addition to the costs of implementing salinity control programs. The investments made in new source water supplies by each of the three cities includes: $80 million for Tracy, $221 million for the City of Stockton, and $43 million for Manteca. The ability to continue to improve source water supplies is limited because surface water supplies are becoming less available, and are likely to become more scarce and expensive as proposed flow restrictions included in this very Bay-Delta Plan Amendment adversely impact the availability of this less saline water. As surface water volumes become less reliable during times of drought, cities often turn to increased groundwater pumping to make up for losses in surface water supplies. The use of groundwater increases effluent salinity due to the higher salt concentrations present in their local Central Valley groundwater basins. Additionally, further improvement in the implementation of existing industrial and residential salinity source controls is not expected to result in a significant lowering of EC in municipal effluent.

The SED's recommendation for desalination of municipal wastewater remains an untried option for Central Valley POTWs, but the implementation of such an action would certainly result in increased energy consumption, increased GHG emissions, new costs and challenges associated with brine disposal, increased costs to ratepayers, and local socioeconomic impacts resulting from increased economic burdens to ratepayers. Furthermore, as shown in **Figure 2** and **Figure 3**, the implementation of RO treatment for Tracy and Mountain House would impart no measurable water quality benefit in the receiving water. It is expected that the same holds true for Manteca, as well.

Planning-level estimates of the capital and operations and maintenance (O&M) costs associated with implementation of RO treatment to meet a proposed 1.0 dS/m EC objective for the cities of Tracy, Stockton, and Mountain House are provided in **Table 3**. The total capital cost alone for these cities exceeds $157 million. The costs shown would be in addition to existing annual O&M costs for each treatment facility and annual expenditures for the supply and treatment of source water and existing source control activities.

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**Table 3: Planning Level Cost Estimates for Reverse Osmosis (RO) Treatment.**

| Discharger | RO Treatment (MGD) required to meet 1,000 µmhos/cm EC Limit[1] | Cost ($ Million) | | |
|---|---|---|---|---|
| | | Capital[2,3] | Annual O&M[2] | Total Annual[4] |
| City of Tracy | 8.3 | $52.3 | $5.2 | $8.7 |
| City of Stockton | 14.8 | $93.3 | $9.2 | $15.5 |
| Mountain House | 1.9 | $12.0 | $1.2 | $2.0 |
| | **Total** | **$157.6** | **$15.6** | **$26.2** |

Notes:
1. Effluent flow requiring RO treatment to meet a 1,000 µmhos/cm (1.0 dS/m) EC effluent limitation using a 25% safety factor to address the range of influent EC concentrations observed for the facility.
2. Capital and O&M costs developed using: Memorandum: Modification of Flow Basis for Treatment Train Costs as Previously Presented in "Advanced Treatment Alternatives for the Sacramento Regional Wastewater Treatment Plant" (Carollo, March 2009; Carollo, 2010). Stockton's figures are from a 2017 Robertson-Bryan, Inc. analysis.
3. Treatment costs include engineering, administrative, legal, and contingency. All costs in December 2016 dollars (ENRCCI 11026). The ENRCCI for the Central Valley (11026) was estimated by calculating the average ENRCCI for the U.S. 20-City Average and the ENRCCI for San Francisco, CA.
4. Total Annual Cost = Annualized Capital Cost + Annual O&M Cost.

The operation of RO treatment systems would also significantly increase the energy demand for each facility, requiring potentially greater power distribution system capacity, back-up power generating capacity, and/or power grid connection capacity. (West Yost Associates, 2011.)[4] RO is an energy-intensive process, as noted in the SED. (SED, p. 16-273.) This increased energy demand would result in a subsequent expansion of GHG emissions and the carbon footprint of each facility. Although not discussed in detail in the SED, the SED acknowledges that operation of RO facilities could have significant and unavoidable environmental impacts. (SED, p. 16-273.) A summary of the potential increased carbon footprint associated with the operation of RO treatment systems is included in **Table 4**. The GHG emission estimates provided in **Table 4** are in addition to those emissions currently generated by each facility.

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[4] The cost of expanding local/regional electricity infrastructure due to increased energy demand from a wastewater treatment plant is not considered in the RO treatment cost estimates provided in Table 3, because the cost of infrastructure expansion would typically be assumed by the power provider and offset by utility rate increases.

**Table 4: Additional Greenhouse Gas Emissions Associated with the Operation of RO Treatment Systems.**

| Discharger | Effluent Treated with Reverse Osmosis (RO) (MGD) | Estimated Daily Electricity Usage for RO Treatment (kWh)[1] | Estimated Annual $CO_2$ Emissions (metric tons)[2] |
|---|---|---|---|
| City of Tracy | 8.3 | 91,300 | 12,224 |
| City of Stockton | 14.8 | 162,800 | 21,833 |
| Mountain House | 1.9 | 20,900 | 2,803 |

1. Daily power usage based on estimate of 11,000 kWh consumed per million gallons treated with RO (Carollo, 2007)

2. $CO_2$ emissions based on 0.81 lbs. of $CO_2$ produced per kWh of electricity consumed (CCAR, 2007).

Brine disposal alternatives include crystallization and land disposal, evaporation/containment ponds, piping or trucking liquid brine for offsite disposal, or deep-well injection. For communities in the Central Valley, which are located significant distances from the ocean or other suitable disposal sites, liquid brine transport is not cost-effective. The volumes of brine generated at the community level are also problematic for deep-well injection. The most viable alternatives are crystallization and disposal (a high-energy process) and use of evaporation/containment ponds (a land-intensive option), each of which represent costly options with an irretrievable commitment of resources. The RO treatment costs provided in **Table 3**, above, include the cost of thermal brine concentration, crystallization, and land disposal.

## 5. The SED Contains Insufficient Analysis of the Salinity Objective Alternatives Proposed, Including the Significant and Unavoidable Impacts to POTWs and the Selection of the Environmentally Superior Alternative

CEQA requires that lead agencies analyze "a range of reasonable alternatives to the project . . . which could feasibly attain the basic objectives of the project, and evaluate the comparative merits of the alternatives." (Cal. Code Regs., tit. 14, § 15126, subd. (d).) CEQA further provides that lead agencies "should not approve projects as proposed if there are *feasible alternatives* . . . available which would substantially lessen the significant environmental effects of such projects." (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 565.)

The SED includes inadequate analysis of the environmental impacts of the proposed salinity objective and the other alternatives. Specifically, the analysis of impacts on POTWs in Chapter 13 of the SED fails to consider the interaction of proposed compliance strategies with the Lower San Joaquin River (LSJR) flow objectives proposed for adoption alongside the salinity objectives. Chapter 13 also considers only a few means of POTW compliance with the salinity objectives, when other possible means of compliance exist, like those recommended herein.

These analyses also assume that the salinity objective would be imposed as an end-of-pipe effluent limit, which is neither appropriate nor necessary, as CVCWA has explained in sections 2 and 3 above. Finally, the analysis selecting the 1.0 dS/m salinity objective as the environmentally superior alternative is not supported by evidence or logic, when considered with impact findings made in the rest of the SED.

**A. Alternatives considered do not include an annual average EC alternative**

The SED proposes three alternatives for the salinity objective: a no-project alternative (arguably status quo), southern Delta objective alternative 2 with a rolling 30-day average EC objective of 1.0 dS/m, and southern Delta objective alternative 3 with a rolling 30-day average EC objective of 1.4 dS/m. (SED, pp. 3-38, 3-40.) None of these alternatives consider an annual average EC objective, which could reduce impacts on POTWs due to the fluctuations in effluent EC on a 30-day basis. Although the SED states that periods longer than 30 days may affect agricultural beneficial uses, the SED does not adequately analyze longer periods, including an annual average. Failing to consider a longer averaging period, especially an annual average alternative, does not fully inform decision makers and the public about the relative impacts of each alternative.

It is likely that a longer averaging period will reduce the severity of impacts on POTWs. It is unclear from the sparse discussion in the SED whether an annual average at the 1.0 dS/m or 1.4 dS/m EC objectives would adversely impact agricultural uses. A blanket statement that the crops do not "see" the average salinity is not enough to justify the elimination of this possible alternative. (SED, p. 3-37.) This is especially true when the analysis of the southern Delta objective alternatives' impacts on agricultural uses came to their significance conclusions based on "assuming *year-round* irrigation salinity concentrations of 1.0 dS/m and 1.4 dS/m. . . ." (SED, p. 11-56 [emphasis added].) More analysis should be done to demonstrate how a longer averaging period would affect both POTWs and agricultural uses. It is likely that a longer averaging period would reduce the impacts on POTWs, so it should be thoroughly analyzed to see if there would actually be an adverse impact on agricultural beneficial uses, based on consideration of crop life stage and the requirement that and EC of 0.7 dS/m be maintained at Vernalis through part of the year.

**B. Impacts to POTWs are inadequately analyzed and do not contain other feasible alternatives**

The SED contains flawed analyses in its discussion of the impacts of the southern Delta objective alternatives on POTWs. These flaws are rooted in the SED's consideration of only limited alternatives that do not include a workable program of implementation that would address POTW compliance with the selected salinity objective.

*Effect of Surface Water Supplies on Effluent Salinity*

First, the SED fails to fully analyze and disclose the impacts of the LSJR flow objectives on the ability of POTWs to comply with the southern Delta salinity objectives. Specifically, the SED suggests that municipalities obtain more surface water supplies and reduce the amount of water supply sourced from groundwater, because groundwater tends to be higher in salinity than surface water. (SED, p. 4-16.) However, the SED does not mention that the LSJR flow objectives may frustrate municipalities' ability to maintain the current level of surface water supply, and may prevent municipalities from obtaining additional surface water supply in the future. These impacts are of particular concern to Manteca and Tracy, who source their surface water supplies from the Stanislaus River via South San Joaquin Irrigation District (SSJID). Without these surface water supplies, these cities would otherwise be largely groundwater-dependent. The same would be true for Stockton, as its only other surface water supply source is from the Stockton East Water District (SEWD), which obtains a limited amount of water from the New Hogan Reservoir and the highly variable Central Valley Project contract from the New Melones Reservoir.

The SED acknowledges that the LSJR flow objective may cause POTWs to source water from groundwater, but does not mention that the reduced availability of LSJR surface water for municipalities can impact the amount of EC discharged by POTWs in these communities. As seen in the above graphs charting effluent salinity over time, increasing the amount of groundwater in a municipality's water supply can lead to elevated EC in POTW effluent. (See **Figures 5-7**, above.) Salinity in effluent decreased in the mid-2000s as cities obtained lower salinity surface water supplies, reducing their reliance on high-salinity groundwater. (See **Figures 5-7**, above.) The LSJR flow objectives can impact the amount of salt entering an urban water supply system and also the amount of salt exiting the system through POTW discharges. Accordingly, this impact on POTWs should be discussed and the recommendation that southern Delta POTWs develop additional surface water supplies should mention the impact that the LSJR flow objectives may have on additional surface water availability.

*Desalination Is Not the Only Way POTWs Can Comply with Salinity Objectives*

Additionally, the SED finds that the proposed alternative - southern Delta objective alternative 2, for a 30-day rolling average EC objective of 1.0 dS/m - presents significant and unavoidable impacts on POTWs primarily because the SED considers desalination, specifically RO, as the only way POTWs can reduce EC in their effluent to meet the objective. (SED, p. 13-70.) As discussed above, CVCWA disagrees that imposing the salinity objective as an end-of-pipe effluent limit is necessary to ensure that the proposed objective is met at the three compliance locations specified in the Bay-Delta Plan amendment. This is because of the very small impact POTW discharges have on salinity in the southern Delta and the lack of significant reductions in ambient salinity even if POTWs were to construct expensive RO facilities. (See **Tables 1-2** and **Figures 3-4**, above.)

The costs of constructing and operating RO facilities have already been analyzed and presented to the State Board in connection with the Salinity Variance Policy. Adjusting these numbers for the proposed 1.0 dS/m EC objective shows that capital required to construct an RO facility would cost:

- Over $93 million for Stockton, assuming that 14.8 million gallons per day [mgd] must be treated to meet the 1.0 dS/m objective;
- Over $52 million for Tracy, assuming 8.3 mgd must be treated to meet the salinity objective; and
- About $12 million for Mountain House, assuming 1.9 mgd must be treated to meet the salinity objective.[5]

On top of these capital outlays, annual operations and maintenance costs would range from $1.2 million for Mountain House to $9.2 million for Stockton. (**Table 3**, above.) It is unnecessary for POTWs to take on such immense expenses when the proposed salinity objective can be implemented in a way that ensures that the objective is met at the compliance locations while not requiring that end-of-pipe effluent limits in NPDES permits match the 1.0 dS/m EC objective.

The State Board should adopt a program of implementation that establishes that the 1.0 dS/m objective should not be imposed as an end-of-pipe effluent limit in POTW NPDES permits. This would remove the need for POTWs to construct and operate RO facilities to comply with the proposed salinity objective. The SED should refine its analysis of the impacts of southern Delta objective alternative 2 on POTWs accordingly, since the additional compliance strategies presented in the program of implementation may lead to a conclusion that this alternative will not have a significant and unavoidable impact.

### C. Analyses of other indirect and additional actions required by the Bay-Delta Plan Amendment should be redone to accommodate a workable program of implementation for POTWs

The SED proposes that the Regional Board would establish effluent limits to ensure that POTWs comply with the 1.0 dS/m EC limit, stating that "[POTWs] with discharges that have a reasonable potential to cause or contribute to an excursion above the numeric objective would have effluent limitations in their NPDES permits to meet the revised objective."

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[5] A calculation of the capital cost for Manteca to construct RO has not been conducted at this time, because under current conditions, Manteca discharges effluent with EC levels below the proposed 1.0 dS/m objective. (See SED, p. 13-24.) This could change, however, based on any additional groundwater Manteca may be required to use to supplement lost supply from SSJID.

(SED, p. 16-215.) CVCWA suggests that this section be revised to reflect CVCWA's proposed changes, particularly its recommended language for the program of implementation, that would otherwise address the need for the Regional Board to impose a 1.0 dS/m effluent limit on POTWs. The program of implementation should contain a method of calculating reasonable potential that takes into account the limited POTW impact on salinity in the southern Delta and the fact that compliance is properly measured in-stream rather than at the end-of-pipe. CVCWA's recommended language contains provisions that would achieve this goal. (**Attachment 1**.)

Additionally, the SED analyzes the potential expansion of surface water intake facilities if municipalities increase their surface water supplies, as proposed in the Bay-Delta Plan amendment. (SED, pp. 16-216 – 16-217.) As mentioned before, this analysis should reflect that additional surface water supplies may be difficult for municipalities to obtain at current or greater levels, given the impacts that the LSJR flow objectives may have on surface water allocations to SSJID, SEWD, and other water suppliers.

Finally, to the extent that CVCWA's suggested alternative compliance strategies would require other indirect actions by POTWs, this section should be revised to include an impact analysis of any such actions.

**D. The analysis selecting the environmentally superior alternative is deficient, but CVCWA's suggestions may address these deficiencies**

The SED concludes that southern Delta objective alternative 2 is the environmentally superior alternative. (SED, p. 18-33.) This alternative was selected after comparing the impacts of a no-project alternative, southern Delta objective alternative 2, and southern Delta objective alternative 3. (SED, p. 18-32.) CEQA requires that when "the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." (Cal. Code Regs., tit. 14, § 15152.6, subd. (e)(2).) As the SED states, this involves evaluating which alternative would result in the fewest significant impacts, yet still achieve project objectives. (SED, p. 18-32.) However, the SED selects alternative 2 as the environmentally superior alternative, which will result in significant and unavoidable impacts (on POTWs), while alternative 3 will not result in any significant and unavoidable impacts. (SED. 18-32.)

The SED attempts to massage its preferred alternative into the environmentally superior alternative by essentially re-evaluating the impacts of the 1.4 dS/m objective proposed in alternative 3. This creates analysis that is inconsistent with the rest of the SED. Specifically, the SED's evaluation of the southern Delta objective alternatives' impacts on agricultural uses found that there would be a less-than-significant impact on agricultural uses under both alternatives 2 and 3. (SED, pp. 11-56 – 11-57.) It also concludes that neither alternative is likely to affect historical salinity levels in the southern Delta. (SED, p. 11-56.) Even in evaluating the slightly higher salinity level in alternative 3, the SED finds that the most salt-sensitive crop grown in the southern Delta, dry beans, would not suffer yield losses greater than 10 percent, which is below the significance threshold identified in the SED. (SED, p. 11-57.) Thus, the SED concludes that alternative 3 would not have a significant impact on agriculture in the southern Delta. (SED, p. 11-57.) Despite this, the SED inexplicably concludes that alternative 3 would not meet the project goal of reasonably protecting agricultural uses, and could not be the environmentally superior alternative. (SED, p. 18-33.) This analysis is inconsistent with the earlier conclusion that alternative 3 would not have a significant impact on agricultural uses.

An even more concerning example of this re-evaluation of alternative 3 is in the SED's discussion of the significant impacts that alternative 2 will have on POTWs. The SED first correctly states that alternative 3 "would be considered the environmentally superior alternative because it has fewer significant and unavoidable impacts." (SED, p. 18-32.) Then, it begins to erode the conclusion reached in Chapter 13 that alternative 2 would have significant and unavoidable impacts on POTWs, but alternative 3 would not. The SED now states that "significant and unavoidable impacts could still occur under alternative 3 because of the program of implementation and the potential for agricultural return flow salinity control or low lift pumping stations." (SED, p. 18-32.) The SED continues and provides that because "the potential combination of methods of compliance under the southern Delta objective alternatives is unknown, so is the scope, magnitude and location of the significant and unavoidable impacts." (SED, p. 18-32.) This makes no sense. If alternative 3 truly has the potential to result in significant and unavoidable consequences to POTWs, then the discussion and analysis in Chapter 13 should reflect this. It seems difficult to come to such a conclusion, when the SED is premised on POTWs needing to implement RO to reach the objective proposed in alternative 2, which is unnecessary for them to do under alternative 3. Additionally, the uncertainty that the SED brings forward about alternative 3's impacts in this chapter should have been raised and discussed in Chapters 13 and 16, where the impacts of alternative 3 on POTWs were analyzed.

CVCWA's suggestions, namely ensuring that the program of implementation and Bay-Delta Plan Amendments provide manageable means for POTW compliance with the proposed salinity objective, could result in a finding in Chapter 13 that alternative 2, the State Board's preferred alternative, would have less-than-significant impacts on POTWs. Everything else being the same, this would put alternatives 2 and 3 on equal footing in terms of neither having significant and unavoidable impacts, and might better allow the State Board to find that alternative 2 is the environmentally superior alternative.

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**6. CVCWA's suggestions will help the State Board fulfill its obligations under the *City of Tracy* decision**

The last time the Bay-Delta Plan was amended, the City of Tracy filed a lawsuit, in which CVCWA intervened, challenging the State Board's and Regional Board's (collectively, Water Boards) attempt to impose salinity water quality objectives on POTWs in the southern Delta without complying with Water Code sections 13241 and 13242. (*City of Tracy v. California State Water Resources Control Board*, Sacramento Super. Ct., Case No. 34-2009-80000392.) On June 1, 2011, the Sacramento Superior Court issued a peremptory writ of mandate requiring the Water Boards to: (1) properly conduct the analysis required in Water Code section 13241; (2) reconsider the salinity objectives taking into consideration the factors listed in Water Code section 13241; and (3) adopt an adequate program of implementation for POTWs to achieve the salinity objectives, including recommendations for appropriate actions to be taken, a reasonable time schedule for those actions to be taken, and a description of the monitoring requirements needed to determine compliance. The outcome of the *Tracy* litigation shows that compliance with Water Code sections 13241 and 13242 must be complied with before the Bay-Delta Plan Amendments can be enforced against southern Delta POTWs.

Since this writ was issued in 2011, a final return on the writ has not yet been filed. Because the Bay Delta Plan Amendments are a part of the Water Board's compliance with the writ, CVCWA believes that its proposed language will assist the Water Boards in complying with the writ of mandate and Water Code sections 13241 and 13242. CVCWA is willing to provide further assistance to State Board staff in this regard.

**7. Conclusion**

CVCWA appreciates the opportunity to provide comments on the salinity objectives proposed in the Bay Delta Plan Amendments and the SED. CVCWA believes that the program of implementation language contained in Attachment 1 will ensure that POTWs can comply with the salinity objective without undue economic burdens. If you have any questions, or if CVCWA can be of any further assistance, please contact me at (530) 268-1338 or eofficer@cvcwa.org.

Sincerely,

Debbie Webster

Debbie Webster,
Executive Officer

Attachments
cc: Dorene D'Adamo, Tam Doduc, Steven Moore, Frances Spivy-Weber

**Attachment 1** – Proposed Language for Inclusion in the Bay-Delta Plan Amendments and Program of Implementation
**Attachment 2** – Central Valley Regional Water Quality Control Board Staff Report on Salinity Variance Policy (June 2014)
**Attachment 3** – Larry Walker Associates, *Memorandum: Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region* (Dec. 6, 2012)

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California Department of Water Resources (DWR). 2007. *DSM2 Modeling Evaluation, City of Tracy and Mountain House CSD.* March 29.

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# ATTACHMENT 1

To be inserted in the Revised Water Quality Control Plan, contained in Appendix K to the SED, after section VI.B.1.v, and replacing sections IV.B.1.vi-vii:

v. DWR's and USBR's water rights shall be conditioned to require continued operations of the agricultural barriers at Grant Line Canal, Middle River, and Old River at Tracy, or other reasonable measures, to address the impacts of SWP and CVP export operations on water levels and flow conditions that might affect southern Delta salinity conditions, including the assimilative capacity for local sources of salinity in the southern Delta. The water right conditions shall require any necessary modifications to the design and operations of the barriers or other measures as determined by the COP.

vi. In addition to the above requirements, the salinity water quality objective for the southern Delta will be implemented through the Lower San Joaquin River flow objectives, which will increase inflow of low salinity water into the southern Delta during February through June and thereafter under adaptive implementation to prevent adverse effects to fisheries. ~~This~~ These implementation measures will assist in achieving the southern Delta water quality objective.

vii. The Central Valley Regional Water Board shall regulate ~~impose discharge controls on~~ in-Delta discharges of salts by agricultural, domestic, and municipal dischargers consistent with applicable state and federal law, including, but not limited to, establishing water-quality based effluent limitations and compliance, monitoring and reporting requirements as part of the reissuance of National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act and the regulations thereunder. ~~Publicly-owned treatment works (POTWs) regulated by NPDES permits that discharge salinity constituents above water quality objectives for EC may qualify for a variance of up to ten years pursuant to the Central Valley Regional Water Board Resolution R5-2014-0074. Actions by POTWs to comply with water quality objectives for EC include, without limitation, source control, such as reducing salinity concentrations in source water supplies; pretreatment programs, such as reducing water softener use among water users; and desalination.~~

viii. **Determining Reasonable Potential To Cause Or Contribute To An Exceedance Of The Southern Delta Salinity Water Quality Objective (Reasonable Potential Analysis)**: Federal regulations at 40 C.F.R. 122.44(d)(1)(ii) require that, "When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent . . . , and where appropriate, the dilution of the effluent in the receiving water." To account for the factors identified in 40 C.F.R. 122.44(d)(1)(ii), such as existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, and the dilution of the effluent in the receiving water, the Central Valley Regional Water Board shall consider the following factors when conducting the Reasonable Potential Analysis for salinity:

(a) **Compliance Locations for Reasonable Potential Analysis**: When evaluating whether a discharge by a Publicly-owned treatment works (POTW) regulated by an NPDES permit has the reasonable potential to cause or contribute to an in-stream excursion of the southern Delta EC objectives, the Central Valley Regional Water Board shall consider available dilution of the effluent in the receiving water, as determined at the following compliance location closest to the point of discharge: San Joaquin River at Airport Way Bridge, Vernalis; San Joaquin River at Brandt Bridge; Old River near Middle River; and Old River at Tracy Road Bridge.

(b) **Controllable Factors Policy**: Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled. Where the salinity of a facility's discharge exceeds the southern Delta salinity water quality objective, but sampling and/or modeling demonstrate that the facility's discharge will not cause any meaningful change or degradation of the receiving water (i.e., downstream salinity is determined by upstream conditions), the facility is not meaningfully or 'reasonably' causing or contributing to an exceedance of the southern Delta salinity water quality objective. In these cases, where the cause of the exceedance is due to uncontrollable factors, the cessation of the facility's discharge would not meaningfully impact downstream receiving water conditions. Consequently, the discharge would not have reasonable potential to cause or contribute to an exceedance of the southern Delta salinity water quality objective, and water quality-based effluent limitations are not required.

(c) **Consideration of Dilution and Assimilative Capacity**: When conducting the Reasonable Potential Analysis, federal regulations allow procedures that account for existing controls on point and nonpoint sources of pollution and that consider dilution of the effluent in the receiving water. DWR's and USBR's water rights are existing controls that provide sufficient flow (i.e., through the Lower San Joaquin River flow objectives) and other measures (e.g., southern Delta agricultural barrier program) to provide dilution and assimilative capacity for local sources of salinity in the southern Delta. When conducting the Reasonable Potential Analysis for NPDES permitted dischargers within the southern Delta, the Central Valley Regional Water Board shall consider these existing controls and dilution by allowing for use of assimilative capacity on an annual average basis.

(d) **Insufficient Data/Information to Conduct a Reasonable Potential Analysis**: Data may be unavailable or insufficient for the Central Valley Regional Water Board to conduct the Reasonable Potential Analysis. If data are unavailable or insufficient to conduct the Reasonable Potential Analysis, the Central Valley Regional Water Board shall require additional monitoring at the applicable compliance location in place of a water-quality based effluent limitation. The discharger may satisfy the additional monitoring requirement through participation in a regional monitoring program. In addition, to ensure salinity discharge is minimized, the Central Valley Regional Water Board shall consider including (1) a performance-based effluent limitation derived in accordance with section IV.B.1.ix.b; (2) a salinity evaluation and minimization plan; (3) participation in the Central Valley Regional Water Board's Salinity Management Strategy for the 2017 Central Valley Salinity and Nitrate Management Plan (SNMP) or a similar program as described in subsection IV.B.1.x.f below.

ix. **Derivation of Effluent Limitations**:

(a) **Water Quality-based Effluent Limitations When Reasonable Potential Exists**:

1. After considering the factors in section IV.B.1.viii, where a discharge is found to have reasonable potential to cause or contribute to an in-stream exceedance of the southern Delta salinity objectives, a water quality-based effluent limitation is required.
2. Unless otherwise requested by the discharger, the Central Valley Regional Water Board shall calculate a final water quality-based effluent limitation by calculating a mass-based load allocation, using a watershed loading analysis consistent with methods for developing a Wasteload Allocation in the USEPA Technical Support Document for Water Quality-Based Toxics Control (1991) (USEPA TSD), and use the mass-based load allocation as the final water quality-based effluent limitation.
3. At the request of the discharger, the Central Valley Regional Water Board may calculate a final water quality-based effluent limitation by using a steady state model to determine critical ambient conditions as an annual average concentration at compliance locations specified in IV.B.1.viii.a to calculate and apply appropriate dilution factors determined through DWR DSM2 or equivalent modeling; or by using a dynamic model following procedures described in the USEPA TSD to calculate dilution credits.

(b) **Performance-based Effluent Limitations**: If the Central Valley Regional Water Board determines that a performance-based effluent limitation is necessary because there is insufficient data to conduct a Reasonable Potential Analysis, or because a facility is unable to achieve immediate compliance with a final water quality-based effluent limitation derived in accordance with IV.B.1.ix.a, the performance-based effluent limitation shall be a mass-based limit calculated as an annual average and shall account for water conservation during drought and growth in the service area.

x. **Compliance with Water Quality-Based Effluent Limitations**: When a POTW regulated by an NPDES permit cannot comply with final water quality-based effluent limitations related to southern Delta salinity objectives calculated in compliance with section IV.B.1.ix.a, the Central Valley Regional Water Board may use the following options:

(a) Issue a variance pursuant to the Central Valley Regional Water Board Resolution R5-2014-0074, or pursuant to any subsequent salinity variance adopted by the Central Valley Regional Water Board;
(b) Adopt a narrative or best management practice-based effluent limitation;
(c) Issue an in-permit compliance schedule for a period of up to 50 years to allow for implementation of the Central Valley Regional Water Board's Salinity Management Strategy contained in the SNMP;
(d) Require participation in the development of a total maximum daily load (TMDL) for EC in the southern Delta;
(e) Require participation in efforts to implement the Salinity Management Strategy contained in the SNMP; and/or
(f) Implement other actions consistent with policies adopted into the Water Quality Control Plan for the Sacramento-San Joaquin River Basin by the Central Valley Regional Water Board (e.g., offsets, alternative compliance projects).

# ATTACHMENT 2

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

# Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin

## To add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity

## Draft Staff Report

*~~March~~ June 2014*

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

**STATE OF CALIFORNIA**

*Edmund G. Brown, Jr., Governor*

**CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY**

*Matthew Rodriquez, Secretary*



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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

# Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin

## To add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity

Draft Staff Report

*~~March~~ June 2014*

**ACKNOWLEDGEMENTS:**

The Central Valley Water Board staff appreciates the support from the Central Valley Clean Water Association.

**Amendments to the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity**

## EXECUTIVE SUMMARY

This Central Valley Regional Water Quality Control Board (Central Valley Water Board) Staff Report describes a proposal to amend the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans) to add policies for *Variances from Surface Water Quality Standards for Point Source Dischargers (Variance Policy)*, a *Variance Program for Salinity (Salinity Variance Program)* and an *Exception from Implementation of Water Quality Objectives for Salinity (Salinity Exception Program)*.

The *Variance Policy* will allow the Central Valley Water Board the authority to grant short-term exceptions from meeting water quality based effluent limitations to dischargers subject to National Pollutant Discharge Elimination System (NPDES) permits. The policy will only apply to non-priority pollutants.

The *Salinity Variance Program* will allow the Central Valley Water Board the authority to grant multiple discharger variances from meeting water quality based effluent limitations for salinity constituents to publicly owned treatment works (POTWs). A multiple discharger variance provides a streamlined approval procedure in which an individual discharger variance application, which is consistent with the multiple discharger variance, does not require separate review and approval from the US Environmental Protection Agency (USEPA) once the multiple discharger variance is approved by USEPA.

The *Salinity Exception Program* will establish procedures for dischargers that are subject to waste discharge requirements (WDRs) and conditional waivers to obtain a short-term exception from meeting effluent or groundwater limitations for salinity constituents.

The *Salinity Variance Program* and the *Salinity Exception Program* will apply to electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

### Project Description and Need for the Proposed Amendments

At this time, there are planning processes by the Central Valley Salinity Alternative for Long-Term Sustainability (CV-SALTS) to develop comprehensive salt and nutrient management plan(s) for the Central Valley and by the State Water Board to review the salinity objectives in the *Water Quality Control Plan for* *the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*. These planning processes may change the water quality objectives applicable to dischargers that are currently facing additional treatment requirements. So there is a need to set permit limitations at a level that protects water quality but does not compel the irretrievable commitment of major resources in advance of the completion of these planning processes.

Staff evaluated a number of regulatory options (Appendix B), including a total maximum daily load (TMDL) for Old River, site-specific water quality objectives, and completion of the salt and nitrate management plans under CV-SALTS. The regulatory option evaluated in this Staff Report must go into effect as soon as possible, be region-wide and address compliance issues with salinity constituents. A variance from surface water quality standards for salinity is an appropriate option for addressing this situation where comprehensive region-wide salinity management plan(s) are under development. Since a variance only applies for dischargers subject to NPDES permits, an exception is an appropriate option for dischargers subject to WDRs and/or conditional waivers so that there are consistent requirements for all dischargers.

**Alternatives Considered**

This Staff Report presents options on variance policies and salinity-specific multiple discharger variance programs for dischargers subject to NPDES permits. The Staff Report also presents options for salinity exception programs for dischargers subject to WDRs and conditional waivers.

**Consistency with Federal and State Laws and Regulations**

This Staff Report demonstrates that the proposed Basin Plan Amendments are consistent with federal and State anti-degradation policies, federal and State laws, and State Water Board and Central Valley Water Board policies and plans.

**Environmental Analysis**

The environmental impacts of the proposed Basin Plan Amendments are analyzed as part of completing the Environmental Checklist in Appendix A. The proposed Basin Plan Amendments do not require and it is not reasonably foreseeable that they would require the installation of pollution control equipment; therefore, an environmental analysis of the reasonable foreseeable methods of compliance is not required. The proposed Basin Plan Amendments will not result in any significant environmental impacts, and no mitigation measures are proposed.

**Proposed Amendment**

The proposed Amendments are to add policies for variances from surface water quality standards for point source dischargers, a multiple discharger variance program for salinity, and an exception from implementation of water quality objectives for salinity.

The *Variance Policy* will allow the Central Valley Water Board the authority to grant short-term exceptions from meeting water quality based effluent limitations to dischargers subject to NPDES permits. The Policy will only apply to non-priority pollutants.

The *Salinity Variance Program* is a multiple discharger variance that will allow the Central Valley Water Board the authority to grant variances from meeting water quality based effluent limitations for salinity constituents to POTWs. The *Salinity Variance Program* is limited to the multiple dischargers that are documented to share the same challenges in achieving their water quality based effluent limitation for the same pollutant(s). The *Salinity Exception Program* will establish procedures for dischargers that are subject to WDRs and conditional waivers to obtain a short-term exception from meeting effluent or groundwater limitations for salinity constituents.

The proposed *Variance Policy* and the multiple-discharger *Salinity Variance Program* will include criteria and conditions consistent with elements that were part of other USEPA-approved variances. The *Salinity Variance Program* and *Salinity Exception Program* will support the development and initial implementation of the comprehensive salt and nitrate management plan(s) (SNMPs) for the Central Valley by requiring applicants to participate in the CV-SALTS efforts. The proposed *Salinity Variance Program* and *Salinity Exception Program* will be in effect during the development and initial implementation of the SNMPs. The SNMPs are expected to result in basin plan amendments that may contain new or revised programs for dischargers to address salinity constituents.~~After basin plan amendments implementing the SNMPs are adopted and in effect, the requirements under the SNMPs will take over.~~

TABLE OF CONTENTS

LIST OF ACRONYMS

| | |
|---|---|
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CTR | California Toxics Rule |
| CVRWQCB | Central Valley Regional Water Quality Control Board |
| CV-SALTS | Central Valley Salinity Alternatives for Long-Term Sustainability |
| EC | Electrical Conductivity |
| LWA | Larry Walker Associates |
| MCL | Maximum Contaminant Levels |
| MES | Mass Emissions Strategy |
| MPS | Municipal Preliminary Screener |
| NMFS | National Marine Fisheries Service |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | Nonpoint Source |
| NTR | National Toxics Rule |
| OAL | Office of Administrative Law |
| OWTS | Onsite Wastewater Treatment Systems |
| POTW | Publicly Owned Treatment Works |
| PPD | Pollutant Policy Document |
| SED | Substitute Environmental Documentation |
| SIP | *Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California* |
| SNMPs | Comprehensive Salt and Nitrate Management Plans for the Central Valley |
| SWRCB | State Water Resources Control Board |
| TDS | Total Dissolved Solids |
| TMDL | Total Maximum Daily Load |
| UAA | Use Attainability Analysis |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USFWS | United State Fish and Wildlife Service |
| WDRs | Waste Discharge Requirements |

# 1 INTRODUCTION

The purpose of this Staff Report is to provide the rationale and supporting documentation for proposed Amendments to the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans). Amendments to the Basin Plans are proposed to provide the Central Valley Regional Water Quality Control Board (Central Valley Water Board) the authority to issue variances from surface water quality standards consistent with federal regulations (title 40 Code of Federal Regulations (CFR) § 131.13.) for point source dischargers and multiple discharger salinity variances for publicly owned treatment works (POTWs). Amendments are also proposed to establish similar provisions for allowing exceptions to implementation of salinity water quality standards for those discharges that are not subject to the federal regulatory requirements.

The *Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California* (State Implementation Plan, SIP) provides a procedure to apply for case-by-case exceptions for toxic pollutants listed pursuant to Clean Water Act section 307(a)(1). These toxic pollutants are also called priority pollutants. Since procedures are already in place for the priority pollutants, the proposed Basin Plan Amendments for *Variances from Surface Water Quality Standards for Point Source Dischargers* will apply only to non-priority pollutants for dischargers subject to National Pollutant Discharge Elimination System (NPDES) permits. The Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) provides procedures for granting exceptions from temperature standards; therefore, the proposed Basin Plan Amendments will not apply to temperature. A *Salinity Variance Program* is proposed to address surface water quality standards for salinity as represented by the constituents: electrical conductivity (EC), total dissolved solids (TDS), chloride, sulfate and sodium for dischargers subject to NPDES permits. The *Salinity Variance Program* will provide a streamlined approval procedure for POTWs that cannot consistently meet water quality based effluent limitations for salinity.

The terms “variance” and “compliance schedule” as used in this Staff Report are consistent with the use in federal regulations. (40 CFR § 131.13. and 40 CFR § 122.47., respectively) The term “time schedule” as used in this Staff Report is consistent with the use in state law. (Wat. Code, § 13263(c).) The proposed Amendments will establish the term “exception” to represent the equivalent of a variance for dischargers that are not subject to federal regulation and, therefore, not subject to federal review and approval.

## 1.1 Regulatory Authority and Mandates for Basin Plan Amendments

The State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (regional water boards) are the state agencies with primary responsibility for coordination and control of water quality. (Wat. Code, § 13000.) Each regional water board is required to adopt a water quality control plan, or basin plan, which provides the basis for regulatory actions to protect water quality. (Wat. Code, § 13240, et seq.) Basin plans designate beneficial uses of water, establish water quality objectives to protect the uses, and include a program of implementation to achieve the objectives. (Wat. Code, § 13050, subd. (j).) Basin plans, once adopted, must be periodically reviewed and may be revised. (Wat. Code, § 13240.)

Under the Clean Water Act (33 United States Code (USC) § 1251 et seq.), the states are required to adopt water quality standards for surface waters. (33 USC § 1313(c).) Water quality standards consist of: 1) designated uses; 2) water quality criteria necessary to protect designated uses; and 3) an antidegradation policy. (33 USC § 1313, subds. (c)(2)(A) and (d)(4)(B); 40 CFR § 131.6.) In California, water quality standards are found in the basin plans, statewide water quality control plans and policies adopted by the State Water Board, and the federal California Toxics Rule (CTR). (40 CFR § 131.38.) Under the Clean Water Act, the states must review water quality standards at least every three years. (33 USC § 1313, subd. (c)(1) and 40 CFR § 131.20.)

Regional water boards adopt and amend basin plans through a structured process involving peer review, public participation, and environmental review. Regional water boards must comply with the California Environmental Quality Act (CEQA) (Pub. Res. Code, § 21000 et seq.) when amending their basin plans. The Secretary for Natural Resources has certified the basin planning process as exempt from the CEQA requirement to prepare an environmental impact report or other appropriate environmental document. (Pub. Res. Code, § 21080.5.; Cal. Code Regs., tit. 14, § 15251, subd. (g).) Rather, State Water Board regulations require that basin plan amendments be accompanied by substitute environmental documentation (SED) that consists of, at a minimum, a written report and an environmental checklist and determination with respect to significant or potentially significant environmental impacts. (Cal. Code Regs., tit. 23, § 3775 et seq.)

Basin plan amendments are not effective until they are approved by the State Water Board and the regulatory provisions are approved by the State Office of Administrative Law (OAL). The United States Environmental Protection Agency (USEPA) also must review and approve amendments that add or modify water quality standards for waters of the United States. In this instance, the *Variances from Surface Water Quality Standards for Point Source Dischargers* (*Variance Policy*) and the *Variance Program for Salinity* (*Salinity Variance Program*) are considered part of a state's water quality standards subject to USEPA review and approval. (40 CFR § 131.13.) The *Exception from Implementation of Water Quality Objectives for Salinity* (*Salinity Exception Program*) is applicable to discharges to waters of the state that are not also waters of the United States or to discharges that are considered to be nonpoint sources. Therefore, the *Salinity Exception Program* is not subject to USEPA review and approval.

## 1.2 Water Quality Control Plans

The Central Valley Water Board first adopted the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans) in 1975. The Basin Plans have been amended over the years as determined appropriate. The current Basin Plans (Fourth Edition, revised October 2011 for the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*; and Second Edition, revised January 2004 for the *Water Quality Control Plan for the Tulare Lake Basin*) incorporates all new amendments approved since 1975.

In accordance with Water Code section 13170, water quality control plans adopted by the State Water Board supersede Regional Water Board basin plans for the same geographic area. The State Water Board adopted the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) which supersedes the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* to the extent that the two plans contain provisions that conflict with each other. The Bay-Delta Plan includes water quality objectives for chlorides, dissolved oxygen and EC that supersede the water quality objectives in the Basin Plans to the extent of any conflict. The Central Valley Water Board is responsible for the regulation of waste discharges to achieve these objectives.

Staff proposes to amend the two Central Valley Basin Plans but not the Bay-Delta Plan to include implementation provisions for *Variances from Surface Water Quality Standards for Point Source Dischargers*, *Variance Program for Salinity*, and *Exception from Implementation of Water Quality Objectives for Salinity*. The implementation programs in the Basin Plans will be used to implement water quality standards contained in the Bay-Delta Plan.

### *1.2.1 Project Area Description*

The Central Valley Region stretches from the Oregon border to the northern tip of Los Angeles County and includes all or part of 38 of the State's 58 counties. Three major watersheds have been delineated within this region, namely the Sacramento River Basin, the San Joaquin River Basin and the Tulare Lake Basin. The three basins cover about 40% of the total area of the State and approximately 75% of the irrigated acreage in California. Surface water supplies tributary to or imported for use within the Central Valley, particularly the San Joaquin River and Tulare Lake basins, are inadequate to support the present level of agriculture and other development; therefore, groundwater resources within the valley are being used to provide additional water to supply demands.

The Sacramento River and San Joaquin River basins are bounded by the crests of the Sierra Nevada on the east and the Coast Range and Klamath mountains on the west. They extend over some 400 miles. The Sacramento River and San Joaquin River basins cover about one fourth of the total area of the State and contain over 43% of the State's irrigated land. Surface water from these two basins meets and forms the Sacramento-San Joaquin Delta (Delta), which ultimately flows to San Francisco Bay. Major groundwater resources underlie both basins.

The Sacramento River Basin covers 27,210 square miles. The principal streams in the basin are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear and American rivers to the east; and Cottonwood, Stony, Cache and Putah creeks to the west. Major reservoirs include Shasta, Oroville and Folsom.

The San Joaquin River Basin covers 15,880 square miles. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers. Major reservoirs include Pardee, Comanche, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. Two major water projects located in the South Delta, the federal Central Valley Project and the State Water Project, pump water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, and portions of the San Francisco Bay Area, as well as within the Delta boundaries. The legal boundary of the Delta is described in Water Code section 12220.

The Tulare Lake Basin comprises the drainage area of the San Joaquin Valley south of the San Joaquin River and encompasses approximately 17,650 square miles. The valley floor makes up slightly less than one-half of the total basin land area. The Kings, Kaweah, Tule, and Kern rivers, which drain the west face of the Sierra Nevada Mountains, provide the bulk of the surface water supply native to the basin. Major reservoirs are Pine Flat, Kaweah, Success and Isabella. Imported surface water enters the basin through the San Luis Canal/California Aqueduct System, Friant-Kern Canal, and the Delta-Mendota Canal.

The boundary between the San Joaquin River Basin and the Tulare Lake Basin is defined to follow the southern watershed boundaries of the Little Panoche Creek, Moreno Gulch, and Capita Canyon to the boundary of the Westlands Water District. From here, the boundary follows the northern edge of the Westlands Water District until its intersection with the Firebaugh Canal Company's Main Lift Canal. The basin boundary then follows the Main Lift Canal to the Mendota Pool and continues eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then follows along the southern boundary of the San Joaquin River drainage basin.

## 1.3 Need for Amendments to the Basin Plan

Regional water boards are required to regulate activities to attain the highest water quality which is reasonable, considering all demands that may be made on the water. (Wat. Code, § 13000.) Each regional water board may issue policy statements related to any water quality matter within its jurisdiction. (Wat. Code, § 13224) Each regional water board is required to establish water quality objectives in basin plans that will ensure the reasonable protection of beneficial uses and the prevention of nuisance, however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. (Wat. Code, § 13241.) Basin plans must include a program of implementation to achieve the water quality objectives. (Wat. Code, § 13242.)

Regional water boards are responsible for prescribing requirements for the discharge of waste within its jurisdiction. Waste discharge requirements (WDRs) for point source discharges to surface waters also serve as federal permits under the NPDES program. (Wat. Code, § 13370 et seq.) The requirements implement any relevant water quality control plans that have been adopted and may contain a time schedule. (Wat. Code, § 13263.) Compliance schedules may be included in NPDES permits to allow dischargers time to implement actions to comply with more stringent permit limitations implementing new, revised, or newly interpreted water quality objectives or criteria in water quality standards (State Water Board Resolution 2008-0025, *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*) (*Compliance Schedule Policy*). The Compliance Schedule Policy limits the duration of compliance schedules to ten years. There are cases where dischargers are making progress but require more than ten years.[1] In addition, because re-evaluation of water quality standards that underlie effluent limitations is not an action leading to compliance with the limitations, compliance schedules are not an appropriate regulatory mechanism when the water quality standards may be revised so that the more stringent permit limitations are no longer applicable. Further discussion of basin planning actions underway that could lead to revision of the water quality standards can be found in Section 1.3.2., below.

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[1] An example of actions that took longer than ten years are the actions undertaken by the City of Tracy to use surface water as the City's main potable water source rather than groundwater. The Tracy City Council approved working with the San Joaquin Irrigation District to use Stanislaus River water in 1995. However, it wasn't until 2005 that the construction was completed and water deliveries could begin. And it took until 2010 to reduce the groundwater use to 3% of the potable water supply. These actions by the City of Tracy reduced salinity levels in the wastewater effluent about 33% between 2005 and 2010. (LWA. 2012. Section IV.a.i., page 12 and Figure 1, page 7.)

Discharges from sources that are not considered point sources under federal law, and discharges to waters of the state that are not also considered waters of the United States are subject to requirements pursuant to the state's Porter-Cologne Water Quality Control Act (Porter-Cologne). In such cases, regional water boards are responsible for prescribing requirements through the issuance of WDRs, or conditional waivers from WDRs. (Wat. Code, §§ 13263, 13269.) Under the state's WDR requirements, regional water boards may provide for time schedules. (Wat. Code § 13263(c).) However, time schedules alone may not be sufficient with respect to issues or uncertainties with the underlying water quality standards for salinity, and dischargers are not in compliance with effluent limitations and/or receiving water limitations that are based on these salinity water quality standards (see Section 1.3.2).

### *1.3.1 General Variance and Exception Authority*

USEPA guidance indicates that a water quality standards variance can be used to provide a mechanism by which NPDES permits can be written where discharger compliance with the underlying water quality standards is demonstrated to be infeasible at the present time within the meaning of 40 Code of Federal Regulations section 131.10(g).

Regional water boards in California have not adopted general variance policies but the State Water Board has adopted policies allowing consideration of exceptions from provisions of specific State plans. These exception policies are in the *Water Quality Control Plan for Ocean Waters of California (Ocean Plan)* and the *SIP.* The exception policies allow the State Water Board, in compliance with CEQA, subsequent to a public hearing, and with the concurrence of the USEPA, to grant exceptions where it determines that granting the exception will not compromise protection of waters for beneficial uses, and that the public interest will be served. The *Ocean Plan* is not applicable to the Central Valley. The SIP provides an exception for priority pollutants but does not address non-priority pollutants.

An additional exception policy is found in the *Thermal Plan*. The *Thermal Plan* allows the regional water boards, with the concurrence of the State Board, in accordance with Clean Water Act section 316(a), to grant an exception from the specific temperature objectives contained in the Plan.

It would be useful for the Central Valley Water Board to have the authority to offer variances for non-priority pollutants in cases where a compliance schedule is not appropriate or is not allowed.

Porter-Cologne does not provide for a specific exception policy, however, regional water boards are to formulate and adopt water quality control plans that conform to the policies set forth in the Act, and such plans must include programs of implementation. (Wat. Code, § 13240 et seq.)

### *1.3.2 A Salinity Management Program*

The Central Valley Water Board and State Water Board, working with a stakeholder coalition, are developing comprehensive salinity and nutrient management plan(s) (SNMPs) for the Central Valley. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is the stakeholder coalition working on a strategic initiative to address problems with salinity and nitrates in the surface waters and groundwaters of the Central Valley. The long-term plan(s) developed under CV-SALTS will identify future management measures aimed at the regulation of major sources of salt, and could include revision of certain beneficial use designations and/or current salinity standards. Under the umbrella of CV-SALTS, implementation of the SNMPs will provide appropriate and reasonable protection of beneficial uses. In addition, the State Water Board is currently reviewing the southern Delta salinity objectives included in the Bay-Delta Plan and will consider various options, including revision of those salinity objectives.

In the meantime, a serious issue exists regarding the adoption of final water quality based effluent limitations for salts in a number of NPDES permits, and effluent limitations and receiving water limitations for salts in WDRs and conditional waivers in the Central Valley.[2] These effluent limitations, which are

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[2] Three NPDES POTWs (City of Tracy Wastewater Treatment Plant, City of Stockton Regional Wastewater Control Facility and City of Manteca Wastewater Quality Control Facility) are used as case studies to demonstrate the difficulties faced by POTWs with stringent salinity limitations, the types of measures that POTWs can take to reduce salinity concentrations in the effluent and the methodology for evaluating the social and economic impact of additional treatment requirements. Larry Walker Associates (LWA. 2012) conducted an analysis of information from the three POTWs to show how each POTW qualifies for a variance within the context of 40 CFR § 131.12.

The electrical conductivity (EC) of the effluent from each of the cities cannot consistently meet the water quality based effluent limitations imposed in their NPDES permits. Each City has implemented source control programs that included industrial pretreatment, residential source control, facility upgrades and source water replacement. While water quality improved, the improvements were not sufficient to consistently comply with the effluent limitations.

A WDR Discharger (Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility (RWRF)) was used to demonstrate the procedure for evaluating the effect of allowing an exception from meeting effluent limitations for salinity for discharges to land. As required by Order R5-01-0254, the monthly average EC effluent limitations of the discharge from the RWRF shall not exceed the flow-weighed average EC of the source water plus 500 µmhos/cm, or a maximum of 900 µmhos/cm, whichever is less. The EC of the discharge is consistently higher than the flow-weighed average EC of the source water 500 µmhos/cm and it has occasionally exceeded 900 µmhos/cm. The City of Fresno has implemented industrial pretreatment, residential source control, facility upgrades and has increased surface water as its source water. However, the effluent quality indicates increasing concentrations of salt.

being derived without the benefit of knowing the ultimate SNMPs or Bay-Delta Plan standards determinations, may end up being inconsistent with those future outcomes, thereby placing numerous communities in a difficult compliance position. In many instances, the effluent limitations are unattainable through any means short of reverse osmosis (membrane) treatment.[3]

The CV-SALTS effort to develop the SNMPs is a holistic process that is expected to include regulatory approaches that result in requirements which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities and others. Ultimately, CV-SALTS will develop management strategies for important sources of salt to protect and maintain water quality in the Central Valley. (CV-SALTS. 2012.)

The need exists to set current permit limitations at a level that protects water quality but that does not compel the irretrievable commitment of major resources in advance of completion of the SNMPs. A variance from surface water quality standards for salinity is an appropriate option for addressing this situation where comprehensive region-wide salinity management plans are under development. Since a variance only applies for dischargers subject to NPDES permits, an exception is an appropriate option for dischargers subject to WDRs and conditional waivers.

[3] Several cities in the Central Valley have conducted an analysis of advanced treatment of wastewater to remove salt. Three technologies are generally acknowledged as proven technologies for removing salt from wastewater: reverse osmosis (RO), electrodialysis reversal (EDR) and nanofiltration (NF). In all cases, the analysis was conducted with the assumption that only a portion of the wastewater effluent needs to be treated and then reblended with the remaining effluent to meet effluent limitations. Generally, NF is found to have the highest capital cost due to the need to treat more effluent. RO and EDR generally have similar life cycle costs but consultants generally recommend RO as the least costly and most proven technology. (CH2M Hill 2011. Chapters 6 and 7.; Stantec 2011. Chapter 3; Carollo 2009. pp. 8-15.)

# 2 BENEFICIAL USES

## 2.1 Regulations that Apply to Beneficial Use Designation

### *2.1.1 State Regulations and Guidance*

Water Code section 13050 defines "'beneficial uses' of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment, navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" and goes on to state that basin plans consist of designation or establishment of beneficial uses to be protected for the waters within the specified area.

State Water Board Resolution 88-63, commonly known as the *Sources of Drinking Water Policy*, establishes state policy that all waters are considered suitable or potentially suitable to support the municipal and domestic supply beneficial use (MUN), with certain exceptions.

The Central Valley Water Board implements the Sources of Drinking Water Policy by assigning MUN to all water bodies not listed in Table II-1 of the Sacramento River and San Joaquin River Basin Plan and to all ground water in the region. Exceptions to the MUN designation are allowed for:

1. Surface and ground waters where:
    a. The TDS exceed 3,000 mg/L (5,000 uS/cm, EC) and it is not reasonably expected by Regional Boards to supply a public water system, or
    b. There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
    c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

2. Surface Waters Where:
    a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

3. Ground water where:
The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 Code of Federal Regulations, section 261.3.

The Central Valley Water Board considers criteria similar to the above when making exceptions to the beneficial use designations of agricultural supply (AGR) and industrial supply (IND or PRO).

### *2.1.2 Federal Regulations and Guidance*

Federal regulations require the protection of designated and existing uses of surface water. Federal regulations establish special protections for uses specified in Clean Water Act section 101(a)(2). Clean Water Act section 101(a)(2) states that it is a national goal that wherever attainable, water quality should be sufficient "for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water." These uses are also referred to as "fishable/swimmable" uses. In order to de-designate, subcategorize, or not designate these uses, the state must support its demonstration of infeasibility with a use attainability analysis (UAA). (40 CFR § 131.10(j).) A UAA is a structured scientific assessment of the factors affecting attainment of the use, which may include physical, chemical, biological, and economic factors. (40 CFR § 131.3(g).)

A designated use, which is not an existing use, may be removed after demonstrating that attaining the use is not feasible due to one or more of the following factors listed in 40 Code of Federal Regulations section 131.10(g):

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like unrelated to water quality preclude attainment of aquatic life protection uses; or
(6) Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

"Existing" uses are defined as uses that were attained on or after 28 November 1975. (40 CFR §131.3(e).) An "existing use" may be established by demonstrating that ~~A use is attained if~~ the use has actually occurred or that the water quality necessary to support the use has been achieved at the discretion of the state~~, even if the use itself is not currently established~~, unless physical factors prevent attainment of the use. (USEPA. 1994.) Uses are deemed attainable if they can be achieved by imposing effluent limitations required under Clean Water Act sections 301(b) and 306 and by implementing cost-effective and reasonable best management practices for nonpoint source control. (40 CFR § 131.10(d).)

## 2.2 Statement of Applicable Beneficial Uses

The Basin Plans designate the following beneficial uses in the Central Valley: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Industrial Process Supply (PRO), Ground Water Recharge (GWR), Freshwater Replenishment (FRSH), Navigation (NAV), Hydropower Generation (POW), Water Contact Recreation (REC-1), Non-contact Water Recreation (REC-2), Commercial and Sport Fishing (COMM), Aquaculture (AQUA), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Estuarine Habitat (EST), Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL), Rare, Threatened, or Endangered Species (RARE), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

The proposed Basin Plan Amendments will not modify the designated beneficial uses. The proposed Basin Plan Amendments establish a *Variance Policy*, a *Salinity Variance Program* for dischargers subject to NPDES permits and a *Salinity Exception Program* for dischargers subject to WDRs and conditional waivers. The proposed Amendments will include procedures to ensure continued reasonable protection of the applicable beneficial uses.

The following beneficial uses are sensitive to concentrations of salt and are protected by either numeric and/or narrative water quality objectives:

- Agricultural supply (AGR)
- Municipal and domestic supply (MUN)
- Industrial service supply (IND)
- Industrial process supply (PRO)
- Ground water recharge (GWR)
- Fish and wildlife uses (EST, COLD, WARM, MIGR, SPWN, WILD, RARE)

# 3 WATER QUALITY OBJECTIVES

## 3.1 Regulations that Apply to Establishing Water Quality Objectives

### *3.1.1 State Regulations and Guidance*

When the Legislature adopted Porter-Cologne, it declared that “activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” (Wat. Code, § 13242.) Basin Plans, as adopted by the regional water boards, are required to conform to this policy. (Wat. Code, § 13240.)

Water Code section 13050 defines water quality objectives as “…the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.”

When adopting water quality objectives, the Central Valley Water Board is required to consider:

(a) Past, present, and probable future beneficial uses of water;
(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
(d) Economic considerations;
(e) The need for developing housing within the region; and
(f) The need to develop and use recycled water. (Wat. Code, § 13241)

### *3.1.2 Federal Regulations and Guidance*

Federal regulations require States to adopt narrative or numeric water quality criteria (synonymous with water quality objectives in California) to protect designated beneficial uses. (40 CFR § 131.11(a)(1).) States are required to adopt numeric criteria for constituents that are considered to be priority toxic pollutants. (33 USC § 1313(c)(2)(B).) Federal regulations permit States to establish water quality criteria based on criteria that USEPA publishes under Clean Water Act section 304(a) modified to reflect site-specific conditions. (40 CFR § 131.11(b)(1)(ii).)

## 3.2 Statement of Applicable Water Quality Criteria and Objectives

Water quality objectives to protect beneficial uses of waters in the Central Valley are found in the Basin Plans and the Bay-Delta Plan. The USEPA promulgated criteria for priority toxic pollutants for surface waters of California in the CTR and National Toxics Rule (NTR). (40 CFR § 131.38.) Currently, there are no State Water Board policies that include statewide water quality objectives that would apply in the Central Valley but several policies are under development.

The Basin Plans include a general narrative water quality objective that chemical constituents, including salinity constituents, shall not be in concentrations that adversely affect beneficial uses. The Basin Plans go on to incorporate the maximum contaminant levels (MCLs) from Title 22 of the California Code of Regulations as water quality objectives for the protection of MUN. There are secondary MCLs for EC, TDS, chloride and sulfate. In addition, both Basin Plans and the Bay-Delta Plan establish site-specific numeric water quality objectives for salinity constituents for certain water bodies.

To protect AGR, the Central Valley Water Board interprets the narrative water quality objective to consider agricultural water quality goals. (Ayers and Westcot, 1985.) When considering such agricultural water quality goals, the Central Valley Water Board is required to consider site-specific conditions associated with the discharge. (*In the Matter of the Own Motion Review of City of Woodland*, Order WQO 2004-0010, p. 7.) The Central Valley Water Board has adopted effluent limitations based on such water quality goals for EC, TDS, chloride and sodium.

The proposed Basin Plan Amendments to establish a *Variance Policy*, a *Variance Program for Salinity*, and a *Salinity Exception Program* from implementation of water quality objectives for salinity will not modify any of the water quality objectives but will affect the implementation of water quality objectives by allowing the Central Valley Water Board to adopt permits, WDRs and conditional waivers that do not require meeting effluent limitations or receiving water limitations based on applicable water quality criteria during the term of the variance or exception. The Amendments will include procedures to ensure the continued protection of beneficial uses and for attaining the highest water quality that is reasonable during the term of the variance or exception. The proposed *Variance Policy* will apply to future water quality objectives for non-priority pollutants adopted by the State Water Board unless otherwise stated in a policy adopted by the State Water Board. The proposed *Salinity Variance Program* and the *Salinity Exception Program* will apply to EC, TDS, chloride, sulfate and sodium.

# 4 PROGRAM OF IMPLEMENTATION

## 4.1 Regulations that Apply to Establishing Implementation Programs

### *4.1.1 State Regulations and Guidance*

Per the Water Code section 13050, subdivision (j)(3) and Water Code section 13242, a basin plan must include an implementation program to achieve water quality objectives. Water Code section 13242 prescribes the contents of an implementation plan, which include the following:

- description of the actions necessary to achieve the water quality objectives;
- time schedule; and
- a monitoring and surveillance program.

Discharges from sources that are not considered point sources under federal law, and discharges to waters of the state that are not also considered waters of the United States are subject to requirements pursuant to Porter-Cologne. In such cases, regional water boards are responsible for prescribing requirements through the issuance of WDRs, or conditional waivers from WDRs. (Wat. Code §§ 13263, 13269.) Regional water boards may include time schedules in WDRs. (Wat. Code, § 13263(c).)

WDRs for point source discharges to waters of the United States also serve as federal permits under the NPDES permit program. (Wat. Code, § 13370 et seq.) The State Water Board adopted the SIP to provide state regulations on implementation provisions for priority pollutant criteria and water quality objectives in NPDES permits. The State Water Board also adopted a *Compliance Schedule Policy* which provides the conditions under which a Regional Water Board may include a compliance schedule in an NPDES permit.

### *4.1.2 Federal Regulations and Guidance*

Section 402 of the Clean Water Act requires a permitting system which USEPA addressed by promulgating 40 Code of Federal Regulations part 122, which are the regulations pertaining to the NPDES program. The State's regulations pertaining to NPDES permits must be consistent with the federal regulations.

Title 40 Code of Federal Regulations section 122.44(d)(1)(ii) sets forth the regulations for determining whether a discharge has a reasonable potential to cause or contribute to a violation of water quality standards. It states, "When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water." While the federal regulations do not contain explicit procedures to derive effluent limitations, USEPA has provided guidance (USEPA. 1991.) that includes explicit procedures.

Title 40 Code of Federal Regulations section 122.47 sets forth the regulations for schedules of compliance for NPDES programs.

## 4.2 Actions Necessary to Achieve the Water Quality Objectives

### *4.2.1 General Variance Authority*

To implement basin plans, NPDES permits must include effluent limitations for discharge of pollutants that have a reasonable potential to cause or contribute to an excursion above water quality standards.

The proposed Basin Plan Amendments allow the Central Valley Water Board to grant a variance from meeting water quality based effluent limitations where compliance has been demonstrated to be infeasible at the present time within the meaning of 40 Code of Federal Regulations, section 131.10(g) and the discharger has considered treatment and control strategies more advanced than that required by sections 301(b) and 306 of the Clean Water Act. However, during the term of the variance, dischargers will be expected to develop and implement pollution prevention plans to reduce the discharge of the pollutant(s). Section 4.5.1 presents the issue, alternatives and staff recommendations for a variance policy.

### *4.2.2 A Salinity Management Program*

Recently-issued discharge permits have included an evaluation of the salinity concentrations in effluent discharges to determine the need for effluent limitations. Regardless of whether the discharge has reasonable potential to cause or contribute to an excursion above water quality standards, consistent with the Central Valley Water Board's salinity priorities, the recent permits have required dischargers to develop and implement salinity reduction plans.

The proposed Basin Plan Amendments will include a *Salinity Variance Program* for dischargers subject to NPDES permits and a *Salinity Exception Program* for dischargers subject to WDRs that are facing costly treatment to comply with effluent limitations and groundwater limitations for salinity constituents. The salinity variance program is a multiple discharger variance which provides streamlined approval procedures for dischargers that share the same challenges in achieving their water quality based effluent limitation for the same pollutants(s). It should be noted that federal regulations (40 CFR Part 131) do not allow economic considerations when promulgating water quality criteria (i.e., establishing water quality objectives for waters of the United States). Economic considerations are also excluded from the procedures for derivation of water quality based effluent limitations. A variance from meeting water quality based effluent limitations must be consistent with at least one of the factors listed in 40 Code of Federal Regulations section 131.10(g), which includes an economic factor. The *Salinity Variance Program* will allow the Central Valley Water Board to grant a temporary exception from meeting the water quality based effluent limitations under certain conditions. The salinity exception will apply to effluent limitations and receiving water limitations for salinity constituents in WDRs and conditional waivers. Section 4.5.2 presents the issue, alternatives and staff recommendations for a *Salinity Variance Program*. Section 4.5.3 presents the issue, alternatives and staff recommendations for a *Salinity Exception Program*.

## 4.3 Time Schedule

WDRs for point source discharges to waters of the United States serve as NPDES permits. (Wat. Code, § 13370 et seq.) WDRs may contain a time schedule. (Wat. Code, § 13263) Compliance schedules may be included in NPDES permits if conditions specified in State and federal regulations (*Compliance Schedule Policy* and 40 CFR § 122.47) are met. The proposed Basin Plan Amendments will allow the Central Valley Water Board to consider a short-term variance for non-priority pollutants in cases when a compliance schedule is either not allowed or is not practical under the state and federal regulations (see Section 1.3 for more discussion). The proposed Basin Plan Amendments will also include a *Salinity Variance Program* for NPDES dischargers to provide for a streamlined review and approval process. The *Salinity Exception Program* provides for the Central Valley Water Board to consider exceptions from effluent limitations and groundwater limitations for salinity constituents in WDRs and conditional waivers.

## 4.4 Monitoring and Surveillance Program

WDRs, including NPDES permits, include a Monitoring and Reporting Program to ensure that the discharger is complying with the Order. If the Central Valley Water Board decides to allow a variance, the proposed Basin Plan Amendments include provisions for additional monitoring and reporting requirements to evaluate receiving water quality conditions during the term of the variance from water quality standards.

### 4.5 Analysis of Issues and Alternatives

NPDES permits include effluent limitations for salinity constituents if there is a demonstration that the discharge of these constituents has a reasonable potential of causing exceedances of water quality objectives in the receiving waters. A serious compliance issue exists for POTWs regarding the adoption of final water quality based effluent limitations for salts in a number of Central Valley NPDES permits. The same compliance issue exists for effluent limitations prescribed by the Basin Plans for WDRs. These effluent limitations, which have been derived without the benefit of knowing the ultimate SNMPs or Bay-Delta standards determinations and which may, in fact, be inconsistent with those future outcomes, are placing numerous communities in a difficult compliance position.

Sources of salt to POTWs include industrial inputs, residential inputs and municipal water supply. POTWs can reduce salinity levels in effluent with source control measures but these measures may not ensure compliance with effluent limitations set to achieve water quality objectives. In many instances, the effluent limitations are unattainable through any means short of reverse osmosis[4]. Therefore, it would be useful for the Central Valley Water Board to have regulatory flexibility when there are effluent limitations for salinity that cannot be met without implementation of expensive treatment technology while there is an ongoing process to review and revise water quality objectives and management plans for salts in the Central Valley. The Central Valley Water Board has authority to include time schedules in WDRs. (Wat. Code § 13263, subd. (c).) However, NPDES discharges are subject to the *Compliance Schedule Policy* and including compliance schedules in NPDES permits is not an option for some dischargers.

In consideration of the issues related to reducing salinity in effluent and the planning processes currently in progress, the Central Valley Water Board has adopted NPDES permits without final water quality based effluent limitations such as the one for the City of Tracy. (CVRWQCB. 2007.) However, upon petition to the State Water Board, the State Water Board remanded the permit to the Central Valley Water Board for final effluent limitations and with the following instructions in Order WQ 2009-0003 (SWRCB. 2009): "On remand, the Central Valley Water Board should consider the salt reduction study and other reasonable ways in which the City could reduce the EC in its discharge to meet the applicable effluent limitation. If it appears that there are no feasible ways to reduce the level of EC to meet the water quality objective, the Central Valley Water Board could then consider various planning options: a total maximum daily load (TMDL) for Old River; site-specific water quality objectives amendment to

[4] See Footnote 3 for a summary of various evaluations of end-of-pipe treatment to remove salinity constituents from wastewater.

the basin plan, or a request to the State Water Board for an amendment to the Bay-Delta Plan; or, if the timing allows, the results of the State and Central Valley Water Boards' joint study and planning process regarding management of salt in the watershed (CV-SALTS, Central Valley Salinity Alternatives for Long-Term Sustainability). Issues pertaining to salts and salt management can be very complex, and planning processes may provide the optimum vehicle for addressing salts. Different planning options require different amounts of time, but a long-term planning solution should not displace interim planning solutions that could afford the Central Valley Water Board additional flexibility in regulating salt discharges. We suggest that a series of planning options could help dischargers comply in the near term while protecting water quality, and also while undertaking longer-term strategies." The State Water Board identified variances, site-specific objectives, or a policy allowing offsets as planning options with shorter time-horizons. (SWRCB. 2009. pp. 9-10, 19.)

There is a need to provide a procedure to set current permit, WDR and conditional waiver limitations at a level that protects water quality but that does not compel the irretrievable commitment of major resources in advance of the completion of the SNMPs. After considering various planning options (Appendix B), staff has determined that a variance is appropriate to allow permitting flexibility so that dischargers do not need to install expensive technology, such as reverse osmosis treatment, to meet salinity effluent limitations while the development of the SNMPs is in progress. A *Salinity Variance Program* is proposed for dischargers that have similar issues meeting the salinity standards. USEPA will review and approve the program as a multiple discharger variance. With the program approved, dischargers that apply for a salinity variance will have a streamlined review and approval procedure in which the Central Valley Water Board will make the final decision on whether or not a variance is granted. USEPA has approved multiple discharger variances for several of the Great Lakes states that were consistent with 40 Code of Federal Regulations part 132.

There are three issues presented, below. The first issue addresses the need for the Central Valley Water Board to have the authority to consider variances for NPDES discharges. The second issue assumes that the Central Valley Water Board will adopt the *Variance Policy* and addresses the salinity issues facing NPDES dischargers with a *Salinity Variance Program*. The third issue assumes the Central Valley Water Board will adopt the *Variance Policy* and the *Salinity Variance Program* and addresses the salinity issues facing WDR dischargers with a *Salinity Exception Program*.

### *4.5.1 Issue 1: Variance Authority*

Issue Description: Regional Water Boards may issue policy statements related to any water quality matter within its jurisdiction. (Wat. Code, § 13224) WDRs for discharges to surface waters serve as NPDES permits. (Wat. Code, § 13370 et seq.) WDRs may contain a time schedule. (Wat. Code, § 13263) In addition, Water Code section 13242 specifies that basin plan implementation programs include a time schedule for achieving the water quality objectives. Compliance schedules may be included in NPDES permits if conditions specified in State and federal regulations (*Compliance Schedule Policy* and 40 CFR § 122.47) are met. However, granting time schedules in NPDES permits for compliance with existing water quality objectives or criteria may not be possible and there may be limitations on schedules in enforcement orders without generating mandatory minimum penalties. In addition, compliance schedules alone are not the appropriate mechanism when there may be issues with the underlying water quality standards and dischargers are not in compliance with the effluent limitations that are based on these water quality standards (see Section 1.3.2 for a discussion illustrating this issue).

USEPA guidance indicates that a water quality standards variance can be used to provide a mechanism by which NPDES permits can be written where discharger compliance with the underlying water quality standards is demonstrated to be infeasible at the present time within the meaning of 40 Code of Federal Regulations section 131.10(g). For NPDES permittees, USEPA guidance notes that a variance provides a "bridge" if additional data or analysis is needed before the state can make a determination whether the designated use or standard is not attainable and should be modified. (USEPA. 2007.) A variance policy may also provide a mechanism that bridges the gap between time schedules allowed under state laws and compliance schedules allowed under federal laws. USEPA has approved variances that include the following elements (USEPA. 1994.):

- each individual variance is included as part of the water quality standard;
- the State demonstrates that meeting the standard is unattainable based on one or more of the grounds outlined in 40 Code of Federal Regulations section 131.10(g);
- the justification submitted by the State includes documentation that treatment more advanced than that required by sections 303(c)(2)(A) and (B) of the Clean Water Act has been carefully considered, and that alternative effluent control strategies have been evaluated;
- the more stringent State criterion is maintained and is binding upon all other dischargers on the stream or stream segment;
- the discharger who is given a variance for one particular constituent is required to meet the applicable criteria for other constituents;
- the variance is granted for a specific period of time and must be rejustified upon expiration but at least every 3 years (Note: the 3-year limit is derived from the triennial review requirements of section 303(c) of the Clean Water Act.);

- the discharger either must meet the standard upon the expiration of this time period or must make a new demonstration of "unattainability";
- reasonable progress is being made toward meeting the standards; and
- the variance was subjected to public notice, opportunity for comment, and public hearing. (33 USC § 1313(c)(l) and 40 CFR § 131.20.) The public notice should contain a clear description of the impact of the variance upon achieving water quality standards in the affected stream segment.

Regional water boards have not adopted general variance policies but the State Water Board has adopted policies allowing consideration of exceptions from provisions of specific State plans. These exception policies are in the *Thermal Plan*, *Ocean Plan* and the SIP*.*

The following are alternatives that the Central Valley Water Board will consider in determining whether to adopt a general variance policy and what requirements to include in the policy.

***4.5.1.1 Alternative 1.*** No Action. Under the no action alternative, the Central Valley Water Board would not go forward with Basin Plan Amendments allowing the Board general variance authority. Variances would not be allowed in the Central Valley unless the State Water Board chooses to adopt a policy that includes the Central Valley. For priority pollutants, interested parties may apply with the State Water Board for an exception in accordance with the exception provisions of the SIP.

***4.5.1.2 Alternative 2.*** Adopt a Central Valley variance policy for all pollutants. Federal regulations allow variance policies to be part of a State's surface water quality standards. (40 CFR § 131.13.) There is federal guidance and precedent for obtaining USEPA approval of variances. Under this alternative, the Central Valley Water Board would consider adopting a general variance policy consistent with 40 Code of Federal Regulations section 131.13. The policy would allow Central Valley Water Board consideration of individual variances for any water quality based effluent limitation. Individual dischargers, when needing to implement a variance, would be able to apply for a variance but the variance would need to be approved by the Central Valley Water Board and the USEPA before it would go into effect. For variances for priority pollutants, State Water Board approval will be needed after Central Valley Water Board approval and prior to USEPA approval.

***4.5.1.3 Alternative 3***. Adopt a Central Valley variance policy for non-priority pollutants. As explained in Alternative 2, federal regulations allow variance policies to be part of a State's surface water quality standards. Currently, the SIP includes exception procedures for case-by-case exceptions from criteria and objectives for priority pollutants. Since there are already procedures for priority pollutants, the Central Valley Water Board only needs authority for the non-priority pollutants. In addition, because the *Thermal Plan* includes an exception for the temperature objectives, this alternative will not allow variances for temperature objectives. Individual dischargers seeking a variance for non-priority pollutants would be able to apply to the Central Valley Water Board for a variance but the variance would need to be approved by the Central Valley Water Board and the USEPA before it would go into effect. Individual dischargers would continue to seek a variance for priority pollutants by applying with the State Water Board under its exception procedures in the SIP.

***4.5.1.4 Alternative 4.*** Adopt a Central Valley variance policy for non-priority pollutants with application and approval procedures. As explained in Alternative 2, federal regulations allow variance policies to be part of a State's surface water quality standards but the regulations do not include any application or review provisions. Federal guidance describes elements of a variance policy that USEPA has approved elsewhere. The SIP includes application requirements and describes the Water Board and USEPA review process as part of the exception procedures. Application and approval procedures provide clarity and certainty for the discharger and the state and would be consistent with the procedures for case-by-case exceptions from the SIP. The application and approval procedures could include the elements that were part of other USEPA-approved variances.

***4.5.1.5 Recommendation.*** Adopt Alternative 4. Alternative 4 will include application requirements and permit conditions to implement the variance. It provides the greatest amount of certainty to dischargers and other stakeholders on what the Board will consider when determining whether or not to grant a variance. Staff recommends that the policy specify that permittees must apply for a variance and the Central Valley Water Board will act on the application if the applicant shows that the variance request is based on one of the factors listed in 40 Code of Federal Regulation section 131.10(g). The variance application can be concurrent with permit renewal. The application must include the constituents for which a variance is requested, information on receiving water(s), proposed interim performance-based effluent limitations that represents the highest water quality that can be achieved consistently during the variance term, methods to reduce/eliminate concentrations of the variance constituent(s), documentation of one or more of the 40 Code of Federal Regulations 131.10(g) factors that applies to the discharge, and documentation of actions that the applicant has taken or will take to reduce the concentrations of the variance constituent(s). If the Regional Board grants the variance, conditions will be included in the permit to require an interim effluent limitation, development and implementation of pollution prevention programs for the constituents for which the variance is granted, and any additional necessary monitoring. The term of the variance may be up to ten years, which includes time for an administrative extension of the permit, with provisions for renewal. Since it would be efficient to have variance terms begin concurrent with permit terms, the policy will specify that permittees that have been granted variances with terms that go beyond the expiration date of the permit may choose to apply for early renewal of the variance by applying for renewal of the variance when applying for renewal of the permit. The *Variance Policy* will be reviewed during the triennial review.

### *4.5.2 Issue 2: Salinity Variance Program*

The Central Valley Water Board has a great deal of information available regarding salinity constituents and is in a planning process to address salinity region-wide. The available information includes quality of waste discharges with respect to salinity constituents from POTWs, the type of controls that POTWs can implement to reduce salinity in effluent discharges, the implementation costs of these controls, the quality of the receiving waters, and the anticipated quality of the receiving waters with full treatment by POTWs. Appendix D is a compilation of the salinity requirements and salinity quality of the effluent for POTWs in the Central Valley as of December 2011. USEPA has approved multiple discharger variances when a state has provided appropriate documentation that a designated use and criterion is unattainable as it applies to multiple permittees because they are all experiencing challenges in meeting their water quality based effluent limitations for the same pollutant for the same reason. Individual variance applications under a multiple discharger variance undergo a streamlined approval process which does not include USEPA review and approval.

Three NPDES POTWs (City of Tracy Wastewater Treatment Plant, City of Stockton Regional Wastewater Control Facility and City of Manteca Wastewater Quality Control Facility) were used as case studies to demonstrate the types of measures that POTWs can take to reduce salinity concentrations in the effluent and to demonstrate the methodology for evaluating the social and economic impact of additional treatment requirements. The use of these three POTWs provides a reasonable expectation of what other POTWs might be able to achieve because of the following: (1) POTWs are not designed to remove salinity constituents so POTWs must implement source control to reduce the salts that enter the wastewater treatment plant or install end-of-pipe treatment to remove salt; (2) sources of salt to POTWs are industrial dischargers, residential dischargers or municipal water supply; (3) the most appropriate end-of-pipe treatment technology for POTWs to remove salinity constituents is reverse osmosis; (4) POTWs finance operations with fees or taxes imposed on their user base, so while the impact to the user base may vary, the procedures to assess impact to the user base are the same; and (5) while each POTW's impact on the receiving water will vary, the POTWs used for case studies have tidal influences and; therefore, represent the most complicated examples of how to evaluate impacts to receiving waters.

As described in a Technical Memorandum from Larry Walker Associates (LWA) (2012), the EC of the effluent from each of the case studies cannot consistently meet the water quality based effluent limitations imposed in their NPDES permits. Each City has implemented source control programs that included industrial pretreatment, residential source control, facility upgrades and source water replacement. While water quality improved, the improvements were not sufficient to consistently comply with the effluent limitations.

In the below discussion, staff used data from the case studies to address the elements that USEPA deems necessary for a variance policy. Note that several of the elements are procedural elements or permit requirements that are not relevant to discharger information. These procedural and permit requirement elements are not discussed below but will be included in the recommended program.

### *A. CONSTITUENTS THAT FALL UNDER THE SALINITY VARIANCE PROGRAM*

Evaluation of the NPDES permits for POTWs in the Central Valley (Appendix D) indicates that POTWs have difficulty meeting water quality based effluent limitations for EC and TDS. Other salinity constituents that are similar to EC and TDS and have similar characteristics are chlorides, sulfate and sodium. In municipal wastewater, all five of these constituents are related in that their sources are similar, reduction strategies affect all of them and the evaluations on advanced treatment are based on these constituents. POTWs that apply for a salinity variance will need to demonstrate which effluent limitations for these salinity constituents they are unable to meet.

Other salinity constituents, such as boron, iron and manganese, were also evaluated. There are treatment technogies that may reduce the levels of these constituents. While the treatment technologies may not reduce the levels of these constituents adequately to achieve effluent limitations, information was not readily available to analyze the effectiveness of treatment technologies. In the future, if sufficient documentation is developed, the Salinity Variance Program can be revised to include to include additional salinity constituents.

### *B. ALTERNATIVE EFFLUENT CONTROL STRATEGIES AND ADVANCED TREATMENT HAVE BEEN CONSIDERED*

POTWs are designed to remove pollutants from domestic, commercial and industrial wastewater and typically consist of physical and biological processes. These processes generally do not affect mineral quality such as salinity. To reduce salinity concentrations in effluent, POTWs implement source control programs that include industrial pretreatment, residential source control, facility upgrades and source water replacement. POTWs that apply for a salinity variance must describe the salinity reduction/elimination measures that have been undertaken and submit a Salinity Reduction Study Work Plan. If the Central Valley Water Board approves the salinity variance, the NPDES permit will include conditions to implement the submitted salinity reduction study.

Industrial pretreatment

The types of industries that might discharge salt to municipal sewer systems and the ability of each industry to control the salt discharges are varied. POTWs have worked with individual industries to reduce salinity levels. Other than that, cities might impose a local limitation to restrict the discharge of salt but imposing a local limitation takes time and without a full analysis of the effect, there is no assurance that the industries can meet the local limitations. (LWA. 2012., p 15, section IV.a.ii.; p19, section IV.c.ii.; p17, section IV.b.ii.)

Residential source control

State law (Wat. Code, § 13148) gives POTWs limited ability to control residential inputs if the source is water softeners. Municipalities may engage in public education and outreach to encourage residents to voluntarily implement measures to reduce salt inputs to the sewer system. (RBI. 2009. p. 14.; LWA. 2010. pp 14-16.) These programs have limited success.

Facility upgrades

Wastewater treatment facility upgrades are usually done to improve biological treatment or solids removal. These upgrades do not affect the salinity in wastewater effluent. Some POTWs can make adjustments to the treatment process to effect slight changes in EC levels. However, these improvements were minor and not really detectible in the normal variability of effluent quality. (LWA. 2012. pp. 17, 20.) In some cases, POTWs using metal salts for primary treatment or chlorination for disinfection can achieve a reduction of salinity by replacing the metal salts or by modifying or replacing disinfection systems. These changes should be evaluated as part of the facility upgrades in the Salinity Reduction Study Work Plan that salinity variance applicants will be required to develop.

Municipal water supply

Improving the municipal water supply is possible if the existing water supply is poor quality groundwater and better quality surface water is available to replace all or part of the groundwater supply. Use of surface water depends on availability and rights to the surface water may be limited in drought years so this may not provide a consistent solution. This conversion to surface water supplies is typically very expensive and takes a very long time. (LWA. 2012. pp. 12-14, section IV.a.i.) State law makes it difficult for local governmental agencies to raise revenue through taxes or fees so obtaining the financing for converting water supplies can be very challenging.

(Proposition 218, as set forth in article XIII C and XIII D of the California Constitution.)

Converting the water supply to surface water is not ~~possible~~ feasible if residents are satisfied with the quality of the municipal water supply and will not pay for better quality water. The recommended maximum contaminant level for EC is 900 µmhos/cm but EC levels ranging up to 1,600 µmhos/cm are acceptable if it is neither reasonable nor feasible to provide more suitable waters. (22 CCR § 64449(a) and (d).) In support of residents that find a higher EC level water supply acceptable, the state has a recommended management strategy to match water quality to use so that higher quality water can be reserved for uses that need the higher quality water. (DWR. 2009.) Maintaining the current water supply may be consistent with this recommended management strategy.

End-of-pipe treatment

In many cases, as illustrated in the case studies, source control reduces salinity concentrations but cannot achieve the water quality based effluent limitations. (LWA. 2012., pp. 12 – 20, Section IV.) Other than source control and source water replacement, the only method to consistently reduce salt is to provide end-of-pipe treatment. Several cities in the Central Valley have conducted an analysis of advanced treatment of wastewater to remove salt. Three technologies are generally acknowledged as proven technologies for removing salt from wastewater: reverse osmosis, electrodialysis reversal and nanofiltration. In all cases, the analysis is conducted with the assumption that only a portion of the wastewater effluent needs to be treated and then reblended with the remaining effluent to meet effluent limitations. Generally, nanofiltration is found to have the highest capital cost due to the need to treat more effluent. Reverse osmosis and electrodialysis reversal generally have similar life cycle costs but consultants typically recommend reverse osmosis as the least costly and the most proven technology. (CH2M Hill. 2011., Chapters 6 and 7.; Stantec. 2011., Chapter 3; Carollo. 2009., pp. 8-15) While reverse osmosis is the least costly of the end-of-pipe treatment options, it is still very expensive, energy intensive and results in a brine (10 to 20 percent of the waste stream) that must be properly disposed. The energy consumption of reverse osmosis and the brine waste stream are environmental impacts that must be considered when planning and designing reverse osmosis. (SWRCB. 2005., p 12.) As discussed above, state laws make it difficult for local governmental agencies to raise revenue to construct and operate this technology. Modeling of water quality that would result from the discharge indicates that the improvements in ambient water quality are imperceptible. (LWA. 2012., pp. 53-59, Section VI.d.; DWR. 2007.; LWA. 2012., pp. 23-37, 46-47, Section V.a, Section V.c.i.)

More discussion on the potential impacts and environmental benefits of reverse osmosis are included below (Attainability of Water Quality Based Effluent Limitations).

## C. *ATTAINABILITY OF WATER QUALITY BASED EFFLUENT LIMITATIONS*

Analysis of the case studies indicates that salinity in the Delta is a human caused condition that cannot be remedied by dischargers and it would result in substantial and widespread economic and social impact to require the dischargers to meet water quality based effluent limitations for salinity. These conclusions are consistent with factors 3 and 6 in 40 Code of Federal Regulations, section 131.10(g) and they demonstrate that it is infeasible for POTWs to attain the water quality based effluent limitations for salinity constituents at this time. The following discussion demonstrates how additional treatment is not feasible for the case studies consistent with the third or sixth factor, individually.

<u>40 CFR section 131.10(g)(3)</u>
The salinity objectives for the Delta have not been attained. Point source dischargers provide a small percentage of the total salt in the Delta, therefore requiring the point source dischargers to meet the water quality based effluent limitations for salinity will not cause the salinity objectives to be met.

The State Water Board recognized that the salinity objectives are largely to be met by a combination of (a) flow releases into the San Joaquin River to attain objectives at Vernalis, (b) installation of physical facilities (pumps and barriers) in the south Delta, and (c) operation of the State Water Project and Central Valley Project. In addition, State Water Board orders and reports over the years since adoption of the salinity objectives did not identify dischargers subject to NPDES permits as sources of salinity to the southern Delta. (SWRCB. 2005., pp. 7-11.)

To characterize the contribution from point source dischargers, a stakeholder group worked with the Department of Water Resources to conduct DSM2 modeling of the salinity impacts of the current and potential future discharges from the City of Tracy and Mountain House Community Services District wastewater treatment plants. The modeling effort produced monthly average volume fractions for the discharges at various locations in the Delta. These volume fractions could then be used to calculate the incremental increase in EC due to the discharges. The incremental increase between meeting the water quality based effluent limitation compared to meeting a performance-based effluent limitation ranged from 5 to 20 µmhos/cm EC in Delta water quality from the discharge from the City of Tracy Wastewater Treatment Plant; which was an order of magnitude lower than other sources of salinity to the Delta. (DWR. 2007.) It should be noted that at the time the modeling was performed, the performance based effluent limitation was calculated to be 1416 µmhos/cm. The City of Tracy has since successfully reduced the salinity in the effluent discharge so the incremental increase in salinity would be lower than the modeling results. (LWA. 2012., p. 13, Figure 5.) A similar analysis was conducted for the other case study cities. The salinity reductions in the Delta that would result from requiring these POTWs to meet their water quality based effluent limitations range from 1 to 18 µmhos/cm (0.31% to 2.68%) within the vicinity of discharge. Modeling indicated that the effect decreased with distance from the discharge point and there would be no detectable change to EC at the compliance points identified in the *Bay-Delta Plan* (Old River at Middle River and San Joaquin River at Brandt Bridge). To evaluate the relative effect of NPDES point sources to the south Delta, the State Water Board conducted a simple mass-balance analysis. It was concluded that the salt loads from point sources in this part of the southern Delta represent a small percentage of the salt load entering from upstream. (SWRCB. 2012., pp. 4-11.)

The 40 Code of Federal Regulations, section 131.10(g)(3) factor is met because although the water quality has been degraded by human caused conditions, imposing water quality based effluent limitations on the wastewater treatment plant would not result in attainment of the water quality standards.

<u>40 CFR section 131.10(g)(6)</u>
To evaluate whether implementation of water quality based effluent limitations for salinity would result in substantial and widespread economic and social impact within the context of 40 Code of Federal Regulations, section 131.10(g)(6), affordability of additional treatment to the case study communities was analyzed in accordance with USEPA guidance. (USEPA. 1995.) For some dischargers, water quality based effluent limitations for salinity are unattainable except with end-of-pipe treatment.

At this time, reverse osmosis appears to be the least costly and the most proven technology for removing salt from wastewater. The municipal preliminary screener (MPS) values were calculated for the case studies based on implementation of reverse osmosis treatment. MPS values were between 1 and 2 which is interpreted as representing a mid-range economic impact to households in these communities. However, these communities also have relatively high unemployment rates ranging from 9.3% to 17.9% and are the largest communities in San Joaquin County which has an unemployment rate of 14.8%. The impact of requiring these communities to implement reverse osmosis treatment would result in a reduction in disposable income to the residents of these communities. Due to their proximity to each other and their relevance to San Joaquin County, the loss of disposable income by the residents in these communities would be felt throughout the region.

In addition to costs, the State Water Board recognized that a large scale reverse osmosis plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. (SWRCB. 2005., p. 12.) Reverse osmosis also has energy consumption and greenhouse gas emissions that must be considered. (LWA. 2012., pp. 53-59, section IV.d.) The estimated increase in greenhouse gas emissions to implement reverse osmosis, while very small, is inconsistent with state law to reduce greenhouse gas emissions (Appendix A, section VII.).

The 40 Code of Federal Regulations section 131.10(g)(6) factor is met because the economic impact of implementing reverse osmosis would be substantial. Although the financial cost is considered moderate for the case study communities, when coupled with the regional unemployment rate, the impacts would be widespread throughout the region. In addition, the energy consumption and greenhouse gas emissions from the operation of a reverse osmosis facility are not consistent with State policies to reduce greenhouse gases and represent a societal impact.

40 CFR 131.10(g)

As described above, the additional end-of-pipe treatment is not feasible for the case study cities consistent with the factors in either factor 3 or 6 of 40 Code of Federal Regulations section 131.10(g). The additional treatment is even more unjustified when the two factors are considered together.

### *D. REASONABLE PROGRESS IS BEING MADE TO ATTAIN THE WATER QUALITY STANDARDS*

The Central Valley Water Board and State Water Board, working with a stakeholder coalition, are developing SNMPs for the Central Valley. The CV-SALTS is the stakeholder coalition that is working on a strategic initiative to address problems with salinity and nitrates in the surface waters and ground waters of the Central Valley. The long-term plan developed under CV-SALTS will identify future management measures aimed at the regulation of major sources of salt, and could include revision of certain beneficial use designations and/or current salinity standards. Under the umbrella of CV-SALTS, implementation of the SNMPs will provide appropriate and reasonable protection of beneficial uses.

To demonstrate reasonable progress towards attaining the water quality standards, dischargers under the *Salinity Variance Program* must participate in CV-SALTS and contribute to the development and implementation of the SNMPs, as well as submit and implement a Salinity Reduction Study Work Plan. While implementation of Salinity Reduction Study Work Plans may not result in improvement for each individual discharger because individual dischargers may have already implemented feasible methods to reduce and eliminate salt loads in its discharge, implementation of the work plans by all dischargers applying for a salinity variance is expected to result in overall improvements to water quality during the term of the variance. In addition, future improvements in water quality throughout the Central Valley are expected through participation in CV-SALTS and the development and implementation of the SNMPs.

The following alternatives for a *Salinity Variance Program* (i.e., a multiple discharger variance for POTWs that cannot meet water quality based effluent limitations for salinity constituents) are based on the assumption that the general variance authority is adopted. If the general variance authority is not adopted, then a *Salinity Variance Program* is not recommended.

***4.5.2.1 Alternative 1.*** No Action. Under this no action alternative, the Central Valley Water Board would not go forward with a *Salinity Variance Program* but the *Variance Policy* would have been adopted under the alternatives described in Section 4.5.1. Dischargers subject to NPDES permits that are interested in pursuing a variance for EC, TDS, chlorides, sulfate or sodium would need to apply for an individual variance under the Central Valley Water Board's general variance authority. Before each individual variance could be implemented in an NPDES permit, the individual variance would need to be approved by the state and the USEPA.

***4.5.2.2 Alternative 2.*** Adopt a multiple discharger variance for dischargers subject to NPDES permits that cannot meet their water quality based effluent limitations for salinity constituents. Establish a salinity-specific program through which regulated NPDES dischargers would apply for a variance from effluent limitations that are based on applicable EC, TDS, chloride, sulfate or sodium water quality objectives. This program would be modeled after a USEPA-approved approach that has been used in the Great Lakes to streamline the approval of individual variances. Under this alternative, the Central Valley Water Board would identify which of the factors listed in 40 Code of Federal Regulation section 131.10(g) make the water quality based effluent limitations for salinity not feasible and the treatment and control measures that are available to reduce salinity. In addition, the Central Valley Water Board will conduct an anti-degradation analysis. To ensure that existing water quality is reasonably protected and that reasonable progress is made toward meeting the water quality standards, dischargers will be required to meet an interim performance-based effluent limitation, implement a Salinity Reduction Study Work Plan, participate in the CV-SALTS efforts and contribute to the development and implementation of the SNMPs. The proposed policy will allow dischargers to apply for and be granted variances for salinity constituents under a multiple discharger variance while basin plan amendments developed and initiated under CV-SALTS to implement the SNMPs are in progress.

***4.5.2.3 Alternative 3.*** Water conservation, drought and recycling provisions. Water conservation, drought and recycling can cause increased concentrations of pollutants in wastewater effluent (see Appendix C). The State supports water conservation and has a conservation plan to reduce per capita urban water use. Most conservation measures reduce the amount of potable water that passes through a household but does not change the waste generated in the household. Therefore, increased conservation may result in increased concentrations of some pollutants; although, the loads would be expected to remain the same.

During periods of drought, residents are called upon to increase water conservation. As discussed above, water conservation reduces the amount of water that passes through a household but does not reduce the amount of pollutants generated in the household. Additionally, municipalities that have access to higher quality surface waters during wet years may not be able to divert water during dry years and may need to resort to poorer quality groundwater to meet municipal needs.

Water recycling can increase salinity if the recycled water is used in a manner that it re-enters the sewerage system. While increased salinity of the effluent does not always result from conservation, drought and recycling, there may be instances where a discharger can demonstrate that salinity increases are due to these activities. In such cases, the Central Valley Water Board should have the authority to consider these increases and make reasonable accommodations in the permit conditions.

***4.5.2.4 Recommendation.*** Adopt Alternative 2.

Alternative 2 will establish an effective and efficient *Salinity Variance Program* which functions as a multiple discharger variance to help facilitate the development of the SNMPs. The Central Valley Water Board has analyzed three POTWs (Cities of Tracy, Stockton and Manteca) as case studies to generate the type of information that USEPA expects to receive in individual variance applications and to develop a multiple discharger variance for salinity. Because the analysis was limited to POTWs, only POTWs will be eligible for a variance under the *Salinity Variance Program*. The *Salinity Variance Program* will apply to EC, TDS, chlorides, sulfate and sodium.

The *Salinity Variance Program* will include application requirements that will allow permittees with conditions similar to the case study cities to apply for a salinity variance. The program will specify that the term of the variance can be for no longer than ten years and will include permit requirements that include performance-based interim effluent limitation(s), and requirements to develop and implement a salinity reduction study and participate in the CV-SALTS efforts by contributing to the development and implementation of the SNMPs. Furthermore, any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body resulting from the variance from water quality standards and any other conditions that the Central Valley Water Board determines to be necessary to implement the terms of the variance will be specified.

The program will also include provisions for renewal of the salinity variances. Since it would be efficient to have variance terms begin concurrent with permit terms, the program will specify that permittees that have been granted variances with terms that go beyond the expiration date of the permit may choose to apply for early renewal of the variance by applying for variance renewal when applying for renewal of the permit.

In the evaluation of the water quality changes experienced by the three case studies, the water quality of the POTWs subject to NPDES permits did not demonstrate that conservation measures implemented in the service area result in an increased concentration of salinity constituents in effluent. Therefore, since the analysis for the *Salinity Variance Program* did not include the effects of water conservation, drought, or recycling, staff recommendation is not to include Alternative 3 in the *Salinity Variance Program*. Instead, this provision should be included as part of the Variance Policy described in Section 4.5.1. POTWs that are not in compliance with water quality based effluent limitations for salinity constituents and can demonstrate a need for interim effluent limitations higher than performance-based effluent limitations will be able to apply for a variance that includes higher interim effluent limitations under the *Variance Policy* as described in Section 4.5.1. Including this provision in the Variance Policy will provide an opportunity to gather documentation on the need for this provision and the effects on receiving water quality. If sufficient documentation is developed, the Salinity Variance Program can be revised to include this provision.

### *4.5.3 Issue 3: Salinity Exception Program*

~~The Central Valley Water Board believes that there should be consistent requirements for dischargers regardless of whether the discharge is to land or to surface waters.~~ NPDES dischargers must receive a variance from surface water quality standards. Dischargers that are subject to WDRs and conditional waivers that are not NPDES permits do not qualify for a variance from surface water quality standards. The Central Valley Water Board believes that there should be consistent requirements for dischargers regardless of whether the discharge is to land or to surface waters. For dischargers subject to WDRs and conditional waivers, staff~~the~~ propose~~sd~~ that the Basin Plan Amendments include an exception provision that would be consistent with the concept of a variance. Information regarding the source control measures and water quality effects of the Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility was analyzed as a case study for the exception program.

Similar to the case studies for the *Salinity Variance Program*, the City of Fresno cannot meet effluent limitations for EC, which is represented by TDS, chlorides, sulfate and sodium. Source control strategies that the City has implemented include industrial pretreatment, residential source control, facility improvements and source water replacement. (LWA. 2012, pp. 21 to 22, section IV.d.) The main difference in the effect of implementing source control between the City of Fresno and the NPDES case studies is that the City of Fresno's effluent limitations are based on an incremental increase from source water; therefore, improvements in source water quality do not help the City meet its effluent limitations (i.e., improvement in source water quality would decrease the effluent limitations).

The City has analyzed end-of-pipe treatment and concluded that reverse osmosis is the most proven technology to consistently reduce the salinity levels in the effluent. (Carollo. 2009, pp. 8-15, section 8.7.3.)

In accordance with the *Antidegradation Policy* (State Water Board, Resolution 68-16), the existing high quality of water should be maintained until it has been demonstrated that a change in quality is consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies. A technical memorandum from Larry Walker and Associates (2012., pp. 37-46, section V.b.) includes an analysis of the potential effect on groundwater quality of allowing an exception from meeting effluent limitations. The analysis was completed with a simple spreadsheet model based on Darcy's Equation and was conducted using hydraulic parameters that were derived from aquifer tests previously conducted for purposes other than the proposed Basin Plan Amendments. Therefore, the aquifer tests were not available for scientific review at this time. The remainder of the analysis provides a simple approach for how to describe the impact of saline discharges. The difference in ground water quality is projected to be 40-41 µmhos/cm or 5-6% higher than without the exception. In addition, it should be noted that effluent discharges would not be expected to cause the groundwater EC to be higher than effluent EC. Since the effluent EC is 827 µmhos/cm, it is not expected that the discharge would cause groundwater EC to exceed 827 µmhos/cm.

The Basin Plan assigns the following beneficial uses to groundwater in this area: municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), industrial process supply (PRO), water contact recreation (REC-1) and non-contact water recreation (REC-2). Generally, as EC increases, there are increasing impacts to these beneficial uses. The drinking water secondary MCLs have three levels for EC: a recommended level of 900 µmhos/cm, an upper level of 1,600 µmhos/cm and a short-term level of 2,200 µmhos/cm. The *Sources of Drinking Water Policy* (State Water Board Resolution 88-63) finds EC greater than 5,000 µmhos/cm is unsuitable for drinking water use. Ayers and Westcot (1985) has been used by the Central Valley Water Board to set salinity limitations to protect agricultural supply and has the following guidelines to evaluate water quality for irrigation use: less than 700 µmhos/cm has no restriction on irrigation use; EC between 700 and 3,000 µhmos/cm has slight to moderate restrictions; and EC greater than 3,000 µmhos/cm has severe restrictions. (Ayers and Westcot. 1985. Table 1.) Ayers and Westcot also compiled salinity guidelines for livestock use. EC less than 1,500 µmhos/cm is considered an excellent supply for all classes of livestock and poultry. (Ayers and Westcot. 1985. Table 6.) Industrial supply needs vary by the industry with some uses intolerant of any salts to some uses that can tolerate unlimited salts (i.e., semiconductor manufacturing and cooling water). Salinity requirements for recreational uses are not well defined; however, full immersion contact recreation occurs in both fresh and marine waters so the difference in salinity levels that would occur with or without the exception program are not likely to affect recreational uses. Salinity requirements for wildlife are also not well defined but should be adequately protective as there are salinity criteria for livestock watering.

In the City of Fresno, the groundwater and the wastewater quality are currently better than and are expected to stay better than 900 µmhos/cm EC. At this EC level, all beneficial uses are maintained; although, higher quality needs of irrigation supply and industrial processing supply may be affected. Since the beneficial uses, water quality objectives and implementation strategies are being re-evaluated by CV-SALTS, salinity requirements for individual dischargers may change. So there is a need to provide flexibility so that dischargers are not required to make an irretrievable commitment of major resources on technology such as reverse osmosis that may have its own significant environmental impacts that should be carefully considered.

The preferred alternative should not only provide permit flexibility but include procedures to support CV-SALTS while it is in process. The following alternatives for a *Salinity Exception Program* are based on the assumption that the *Variance Policy* and the *Salinity Variance Program* are adopted. If the *Variance Policy* or the *Salinity Variance Program* is not adopted, then a *Salinity Exception Program* is not recommended.

***4.5.3.1 Alternative 1.*** No Action. Under this no action alternative, the Central Valley Water Board would not go forward with a *Salinity Exception Program* even though the *Variance Policy* would have been adopted under the alternatives described in Section 4.5.1 and a *Salinity Variance Program* would have been adopted under the alternatives described in Section 4.5.2. While Water Code section 13263 allows the Central Valley Water Board to include time schedules for dischargers subject to WDRs, a specific case-by-case exception from water quality based salinity requirements and basin plan effluent limitations for salinity for dischargers with WDRs and/or conditional waivers would not exist.

***4.5.3.2 Alternative 2.*** Adopt a *Salinity Exception Program* for dischargers subject to WDRs and/or conditional waivers. Include case-by-case exceptions to salinity requirements through a *Salinity Exception Program* which will have conditions consistent with the *Salinity Variance Program* described in Section 4.5.2. Under a *Salinity Exception Program*, dischargers regulated with WDRs and/or conditional waivers meeting specified conditions would apply for and obtain a case-by-case exception from existing EC, TDS, chloride, sulfate or sodium requirements.

***4.5.3.3 Alternative 3.*** Water conservation, drought and recycling provisions. Water conservation, drought and recycling can cause increased concentrations of pollutants in wastewater effluent (see Appendix C). The State supports water conservation and has a conservation plan to reduce per capita urban water use. Most conservation measures reduce the amount of potable water that passes through a household but does not change the waste generated in the household. Therefore, increased conservation may result in increased concentrations of some pollutants; although, the loads would be expected to remain the same.

During periods of drought, residents are called upon to increase water conservation. As discussed above, water conservation reduces the amount of water that passes through a household but does not reduce the amount of pollutants generated in the household. Additionally, municipalities that have access to higher quality surface waters during wet years may not be able to divert water during dry years and may need to resort to poorer quality groundwater to meet municipal needs.

Water recycling can increase salinity if the recycled water is used in a manner that it re-enters the sewerage system. While increased salinity of the effluent does not always result from conservation, drought and recycling, there may be instances where a discharger can demonstrate that salinity increases is due to these activities. In such cases, the Central Valley Water Board should consider these increases and make reasonable accommodations in WDRs and conditional waiver provisions.

***4.5.3.4 Recommendation.*** Adopt Alternatives 2 and 3.

Alternatives 2 and 3 will establish an effective and efficient Salinity Exception Program to help facilitate the development of the SNMPs and emphasize that salt management is a high priority for the Central Valley Water Board. Alternative 2 establishes the factors that the Central Valley Water Board will consider to provide dischargers subject to WDRs and conditional waivrs a program similar to the Salinity Variance Program described in section 4.5.2. The Central Valley Water Board analyzed a municipal wastewater treatment facility discharger (City of Fresno) as a case study to evaluate the impact of a short-term exception from meeting Basin Plan salinity requirements.

In the evaluation of the water quality changes experienced by the municipal discharger subject to WDRs, the effluent EC showed slightly increasing concentrations even though the municipality has started use of better quality surface waters, increased industrial source control, instituted a salinity outreach program to improve the quality of residential wastewater and changed facility operations to optimize removal of salt compounds in the effluent. It is possible that the increasing salinity concentrations are due to water conservation efforts or the necessary use of groundwater during drought years. Therefore, the staff recommendation is to incorporate Alternative 3 into the *Salinity Exception Program* to clarify that the Central Valley Water Board may consider water conservation, drought and water recycling when determining the appropriate performance-based effluent limitations that will be in effect during the term of the exception.

## 5 PROPOSED BASIN PLAN AMENDMENTS

The proposed changes to the Basin Plans are as follows. Text additions to the existing Basin Plan language are indicated by underline and text deletions are indicated by ~~strikethrough~~. Entirely new policies are shown in their final format and are not underlined.

**Revise Chapter II, Existing and Potential Beneficial Uses, page II-1.00 for both Basin Plans as follows:**

Beneficial use designation (and water quality objectives, see Chapter III, or variance of a water quality standard, see Chapter IV) must be reviewed at least once during each three-year period for the purpose of modification as appropriate (40 C.F.R. 131.20).

**Revise Chapter IV, Implementation, of the Sacramento/San Joaquin Rivers Basin Plan under "Control Action Considerations of the Central Valley Regional Water Board, Policies and Plans", as follows:**

The following *are the Regional Water Board's* policies ~~were adopted, or are hereby adopted, by the Regional Water Board. The first four policies were adopted as part of the 1975 Basin Plan. Items 7 through 11~~13 ~~are new policies:~~ *to protect water quality in the Central Valley.*

**Revise Chapter IV, Implementation, under "Policies and Plans of the Control Action Considerations of the Central Valley Regional Water Board" starting on page IV-14.00 of the Sacramento/San Joaquin Rivers Basin Plan, and under the "Nature of Control Actions Implemented by the Regional Water Board" starting on page IV-19 of the Tulare Lake Basin Plan, to add the following new policy:**

*Variance Policy for Surface Waters*
As part of its state water quality standards program, states have the discretion to include variance policies. (40 C.F.R., §131.13.) This policy provides the Regional Water Board with the authority to grant a variance from application of water quality standards under certain circumstances.

I. Variances from Surface Water Quality Standards for Point Source Dischargers

A. A permit applicant or permittee subject to an NPDES permit may apply to the Regional Water Board for a variance from a surface water quality standard for a specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R., §131.38(b)(1), or temperature. The application for such a variance shall be submitted in accordance with the requirements specified in section II of this Policy. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitation(s) (WQBELs) for the same pollutant(s). The *Variance Program for Salinity Water Quality Standards* in section III, below, is a multiple discharger variance program. Permittees that qualify for the *Variance Program for Salinity Water Quality Standards* by meeting the criteria in section III.A. may submit a salinity variance application in accordance with the requirements specified in section III of this Policy.

B. The Regional Water Board may not grant a variance if:

(1) Water quality standards addressed by the variance will be achieved by implementing technology-based effluent limitations required under sections 301(b) and 306 of the Clean Water Act, or
(2) The variance would likely jeopardize the continued existence of any endangered species under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

C. The Regional Water Board may approve all or part of a requested variance, or modify and approve a requested variance, if the permit applicant demonstrates a variance is appropriate based on at least one of the six following factors:

(1) Naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or
(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable surface water quality standards to be met; or
(3) Human caused conditions or sources of pollution prevent the attainment of the surface water quality standard and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way

that would result in the attainment of the surface water quality standard; or

(5) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection of surface water quality standards; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

D. In making a determination on a variance application that is based on factor (3) in paragraph C above, the Regional Water Board may consider the following:

(1) Information on the type and magnitude of adverse or beneficial environmental impacts, including the net impact on the receiving water, resulting from the proposed methodologies capable of attaining the adopted or proposed WQBEL.

(2) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.

E. In making a determination on a variance application that is based on factor (6) in paragraph C. above, the Regional Water Board may consider the following:

(1) The cost and cost-effectiveness of pollutant removal by implementing the methodology capable of attaining the adopted or proposed WQBEL for the specific constituent(s) for which a variance is being requested.

(2) The reduction in concentrations and loadings of the pollutant(s) in question that is attainable by source control and pollution prevention efforts as compared to the reduction attainable by use of the methodology capable of attaining the adopted or proposed WQBEL.

(3) The overall impact of attaining the adopted or proposed WQBEL and implementing the methodologies capable of attaining the adopted or proposed WQBEL.

(4) The technical feasibility of installing or operating any of the available methodologies capable of attaining the WQBEL for which a variance is sought.

(5) Other relevant information requested by the Regional Water Board or supplied by the applicant or the public.

F. A determination to grant or deny a requested variance shall be made in accordance with the procedures specified in section II, below. Procedures specified in section III, below, will be used for applicants that qualify for the *Variance Program for Salinity Water Quality Standards*.

G. A variance applies only to the permit applicant requesting the variance and only to the constituent(s) specified in the variance application.

H. A variance or any renewal thereof shall be for a time as short as ~~possible~~ feasible and shall not be granted for a term greater than ten years.

I. Neither the filing of a variance application nor the granting of a variance shall be grounds for the staying or dismissing of, or a defense in, a pending enforcement action. A variance shall be prospective only from the date the variance becomes effective.

J. A variance shall conform to the requirements of the State Water Board's *Antidegradation Policy*.

II. Variance Application Requirements and Processes

A. An application for a variance from a surface water quality standard for a specific constituent(s) subject to this Policy may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a surface water quality standard, and/or an adopted wasteload allocation. The variance application may be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.

B. The granting of a variance by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the variance applicant to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act, or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of a variance.

C. A complete variance application must contain the following:

(1) Identification of the specific constituent(s) and water quality standard(s) for which a variance is sought;

(2) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;

(3) Identification of the WQBEL(s) that is being considered for adoption, or has been adopted in the NPDES permit;

(4) List of methods for removing or reducing the concentrations and loadings of the pollutants with an assessment of technical effectiveness and the costs and cost-effectiveness of these methods. At a minimum, and to the extent feasible, the methods must include source control measures, pollution prevention measures, facility upgrades and end-of-pipe treatment technology. From this list, the applicant must identify the method(s) that will consistently attain the WQBELs and provide a detailed discussion of such methodologies;

(5) Documentation of at least one of the following over the next ten years. Documentation that covers less than ten years will limit the maximum term that the Regional Water Board can consider for the variance:

(i) That naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard or

(ii) That natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable surface water quality standards to be met; or

(iii) That human caused conditions or sources of pollution prevent the attainment of the surface water quality standard from which the WQBEL is based, and it is not ~~possible~~ feasible to remedy the conditions or sources of pollution; or

(iv) That dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the surface water quality standard; or

(v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection of surface water quality standards from which the WQBEL is based; or

(vi) That installation and operation of each of the available methodologies capable of attaining the WQBEL would result in substantial and widespread economic and social impact.

(6) Documentation that the permittee has reduced, or is in the process of reducing, to the maximum extent practicable, the discharge of the pollutant(s) for which a variance is sought through implementation of local pretreatment, source control, and pollution prevention efforts; and,

(7) A detailed discussion of a proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. Such discussion shall also identify and discuss any drought, water conservation, and/or water recycling efforts that may cause certain constituents in the effluent to increase, or efforts that will cause certain constituents in the effluent to decrease with a sufficient amount of certainty. When the permittee proposes an interim discharge limitation(s) that is higher than the current level of the constituent(s) in the effluent due to the need to account for drought, water conservation or water recycling efforts, the permittee must provide appropriate information to show that the increase in the level for the proposed interim discharge limitation(s) will not adversely affect beneficial uses, is consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R., § 131.12.), and is consistent with anti-backsliding provisions specified in section 402(o) of the Clean Water Act. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to recycling efforts or management measures, then the proposed interim discharge limitation(s) shall account for such decreases.

(8) Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.

D. Within 60 days of the receipt of a variance application, the Regional Water Board shall determine that the variance application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the agreed upon time period may result in the denial of the variance application.

E. The Regional Water Board shall provide a copy of the variance application to USEPA Region 9 within 30 days of finding that the variance application is complete.

F. Within a reasonable time period after finding that the variance application is complete, the Regional Water Board shall provide public notice, request comment, and schedule and hold a public hearing on the variance application. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.

G. The Regional Water Board may approve the variance, either as requested, or as modified by the Regional Water Board. The Regional Water Board may take action to approve a variance and renew and/or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

(1) An interim effluent limitation for the constituent(s) for which the variance is sought. The interim effluent limitation(s) must be consistent with the current level of the constituent(s) in the effluent and may be lower based on anticipated improvement in effluent quality. The Regional Water Board may consider granting an interim effluent limitation(s) that is higher than the current level if the permittee has demonstrated that drought, water conservation, and/or water recycling efforts will cause the quality of the effluent to be higher than the current level and that the higher interim effluent limitation will not adversely affect beneficial uses. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;

(2) A requirement to prepare and implement a pollution prevention plan pursuant to Water Code section 13263.3 to address the constituent(s) for which the variance is sought;

(3) Any additional monitoring that is determined to be necessary by the Regional Water Board to evaluate the effects on the receiving water body of the variance from water quality standards;

(4) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards or by EPA upon review of the variance; and

(5) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.

H. The variance, as adopted by the Regional Water Board in section G, is not in effect until it is approved by U.S. EPA.

I. Permit limitations for a constituent(s) contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of a variance application for that particular constituent(s).

J. The permittee may request a renewal of a variance in accordance with the provisions contained in paragraphs A, B and C and this section. For variances with terms greater than the term of the permit, an application for renewal of the variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard(s). Renewal of a variance may be denied if the permittee did not comply with any of the conditions of the original variance.

K. All variances and supporting information shall be submitted by the Regional Water Board to the U.S. EPA Regional Administrator within 30 days of the date of the Regional Water Board's final variance decision for approval and shall include the following:

(1) The variance application and any additional information submitted to the Regional Water Board;

(2) Any public notices, public comments, and records of any public hearings held in conjunction with the request for the variance;
(3) The Regional Water Board's final decision; and
(4) Any changes to NPDES permits to include the variance.

L. All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

III. Variance Program for Salinity Water Quality Standards

The State Water Board and the Regional Water Board recognize that salt is impacting beneficial uses in the Central Valley and management of salinity in surface and ground waters is a major challenge for dischargers. In response, the Water Boards initiated the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) in 2006. The State Water Board *Recycled Water Policy* requires the development of salt and nutrient management plans protective of ground water and submittal of these plans to the Regional Water Board by May 2016. These plans are to become the basis of basin plan amendments to be considered by the Regional Water Board by May 2017. CV-SALTS is the stakeholder effort working to develop comprehensive salt and nitrate management plans (SNMPs) that will satisfy the Recycled Water Policy's salt and nutrient management plans. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to assure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024 and R5-2010-0024 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.

A. During the development and initial implementation of the SNMPs by CV-SALTS, permittees who qualify may apply for a variance from salinity water quality standards if they have or will have WQBELs for salinity that they are unable to meet by submitting a salinity variance application. The *Salinity Variance Program* as described specifically herein is for municipal and domestic wastewater dischargers that have or will implement local pretreatment, source control, and pollution prevention efforts to reduce the effluent concentrations of salinity constituents and are now faced with replacing the municipal water supply with a better quality water or installing costly improvements, such as membrane filtration treatment technology, such that widespread social and economic impacts are expected consistent with the justification provided for the case study cities in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, [Final Date of Amendment]*. Consistent with the planned development and implementation of the SNMPs, no salinity variance under this section shall be approved after 30 June 2019. For the purposes of the *Salinity Variance Program*, salinity water quality standards are defined to only include water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

B. An application for a variance for a specific salinity water quality standard may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a salinity water quality standard. Preferably, the salinity variance application should be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the Regional Water Board makes a determination on the variance application.

C. An application for variance from WQBELs based on a salinity water quality standard must contain the following:

- (1) Identification of the salinity constituents for which the variance is sought;
- (2) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
- (3) Identification of the WQBEL that is being considered for adoption, or has been adopted in the NPDES permit;
- (4) A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;
- (5) A Salinity Reduction Study Work Plan, which at a minimum must include the following:
  - (i) Data on current influent and effluent salinity concentrations,

(ii) Identification of known salinity sources,
(iii) Description of current plans to reduce/eliminate known salinity sources,
(iv) Preliminary identification of other potential sources,
(v) A proposed schedule for evaluating sources,
(vi) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

(6) An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the WQBELs for salinity.

(7) A detailed discussion explaining why the permittee's situation is similar to or comparable with the case studies supporting the *Salinity Variance Program* identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, [Final Date of Amendment]*.

(8) A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to efforts, then the proposed interim discharge limitation(s) shall account for such decreases.

(9) Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.

(10) A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.

D. After the receipt of a variance application for salinity, the Regional Water Board shall determine whether the variance application is complete and whether the permittee qualifies for consideration of the variance, or specify in writing any additional relevant information that is deemed necessary to make a determination on the salinity variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the Regional Water Board Executive Officer. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the time period specified by the Executive Officer may result in the denial of the variance application for salinity.

E. After determining that the variance application for salinity is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the variance application for salinity. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the Regional Water Board's process for the renewal of the NPDES permit.

F. The Regional Water Board may approve a salinity variance, either as requested, or as modified by the Regional Water Board, after finding that the permittee qualifies for the salinity variance, the attainment of the WQBEL is not feasible, the permittee has implemented or will implement feasible salinity reduction/elimination measures and the permittee continues to participate in CV-SALTS consistent with the demonstrations based on the case studies identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, [Final Date of Amendment]*. The Regional Water Board may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of following:

(1) The interim effluent limitation(s) that are determined to be attainable during the term of the variance. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;

(2) A requirement to implement the Salinity Reduction Study Work Plan submitted with the variance application as required by paragraph C.5, above;

(3) A requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan required by paragraph C.10, above.

(4) Any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body of the variance from water quality standards;

(5) A provision allowing the Regional Water Board to reopen and modify the permit based on any revision to the variance made by the Regional Water Board during the next revision of the water quality standards;

(6) Other conditions that the Regional Water Board determines to be necessary to implement the terms of the variance.

G. Permit limitations for a substance contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of the variance application for that particular substance.

H. The permittee may request a renewal of a salinity variance in accordance with the provisions contained in paragraphs B and C of this section. For variances with terms greater than the term of the permit, an application for renewal of the salinity variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance, and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.

I. All variances shall be reviewed during the Regional Water Board's triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the Regional Water Board may also review the variance upon consideration of the permit renewal.

**Revise Chapter IV, Implementation, under "Policies and Plans" of the "Control Action Considerations of the Central Valley Regional Water Board" starting on page IV-14.00 of the Sacramento/San Joaquin Rivers Basin Plan, and under the "Salinity" section starting on page IV-5 of the Tulare Lake Basin Plan, to add the following new policy:**

*Limited-Term Exceptions from Basin Plan Provisions and Water Quality Objectives for Groundwater and for non-NPDES Dischargers to Surface Waters*

Pursuant to Water Code sections 13050 and 13240 et seq., the Regional Water Board has adopted beneficial use designations and water quality objectives that apply to surface and ground waters in the basins covered by this Basin Plan as well as programs of implementation. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a stakeholder effort to develop comprehensive salt and nitrate management plans (SNMPs) by May 2016 that is expected to result in basin plan amendments that will be considered by the Regional Water Board by May 2017. CV-SALTS is undertaking technical work to analyze salt and nitrate conditions in surface and ground water in the Central Valley, identify implementation measures, and develop monitoring strategies to ensure environmental and economic sustainability. The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to ensure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024 and R5-2010-0024 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board. The Regional Water Board finds that it is reasonable to grant exceptions to the discharge requirements related to the implementation of water quality objectives for salinity for non-NPDES dischargers to surface water, and for discharges to groundwater in order to allow for development and implementation of the SNMPs.

### Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity

1. Any person[5] subject to waste discharge requirements and/or conditional waivers issued pursuant to Water Code 13269 that are not also NPDES permits may apply to the Regional Water Board for an exception to discharge requirements from the implementation of water quality objectives for salinity. The exception may apply to the issuance of effluent limitations and/or groundwater

[5] The term "person" includes, but is not limited to, "any city, county, district, the state, and the United States, to the extent authorized by federal law." (Wat. Code, § 13050, subd. (c).)

limitations that implement water quality objectives for salinity in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for salinity in surface water. For the purposes of this Program, salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The application for such an exception(s) shall be submitted in accordance with the requirements specified in paragraph 8, below.

2. An exception to discharge requirements from the implementation of water quality objectives for salinity imposed as limitations in either waste discharge requirements and/or conditional waivers that are not also NPDES permits shall be set for a term not to exceed ten years. For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term. The Regional Water Board review will be conducted during a public hearing. An exception may be renewed beyond the initial term if the SNMPs are still under development, and if a renewal application is submitted in accordance with the requirements specified in paragraph 8, below. A renewal must be considered during a public hearing held in accordance with paragraph 10, below.

3. The Regional Water Board will consider granting an exception to the implementation of water quality objectives for salinity under this Program if the applicant is actively participating in CV-SALTS as indicated by the letter required under paragraph 8.e., below.

4. When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall consider including an interim performance-based effluent limitation and/or groundwater limitation that provides reasonable protection of the groundwater or the receiving water, where appropriate. When establishing such a limitation, the Regional Water Board shall take into consideration increases in salinity concentrations due to drought, water conservation, and/or water recycling efforts that may occur during the term of the exception granted.

5. When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall require the discharger to prepare and implement a Salinity Reduction Study Work Plan, or a salinity-based watershed management plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:

a. Data on current influent and effluent salinity concentrations;
b. Identification of known salinity sources;
c. Description of current plans to reduce/eliminate known salinity sources;
d. Preliminary identification of other potential sources;
e. A proposed schedule for evaluating sources; and

f. A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A salinity-based watershed management plan shall at a minimum include the following[6]:

a. A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of salinity, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;

b. A management plan strategy that includes a description of current management practices being used to reduce or control known salinity sources;

c. Monitoring methods;

d. Data evaluation; and,

e. A schedule for reporting management plan progress.

6. When granting an exception to the implementation of water quality objectives under this Program, the Regional Water Board will include a requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan submitted under paragraph 8.f, below.

7. The granting of an exception to the implementation of water quality objectives for salinity under this Program by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the applicant for the exception to prepare such documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of an exception from implementation of water quality objectives for salinity in groundwater and/or surface water.

8. A person seeking an exception to the implementation of water quality objectives for salinity under this Program must submit an application to the Regional Water Board. The person's request shall include the following:

[6] A salinity-based watershed management plan prepared to meet requirements contained within adopted waste discharge requirements, such as those contained in MRP Order R5-2012-0116, Appendix MRP-1, and that is approved by the Executive Officer of the Regional Water Board may be used in lieu of new requirements identified here.

a. An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with salinity constituents at this time;

b. A description of salinity reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity-based watershed management plan and progress of its implementation;

c. A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters;

d. Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Regional Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.

e. Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS.

f. A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.

9. Upon receipt of an application for an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall determine that the exception application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the exception request. Failure of an applicant to submit any additional relevant information requested by the Regional Water Board Executive Officer within the applicable time period may result in the denial of the exception application.

10. Within a reasonable time period after determining that the exception application is complete, the Regional Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The exception shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.

11. There will be no new salinity exceptions and salinity exceptions will not be renewed after 30 June 2019.

**Revise Page IV-3 of the Tulare Lake Basin Plan under the heading of "Irrigated Agriculture" as follows:**

- Agricultural drainage may be discharged to surface waters provided it does not exceed 1,000 umhos/cm EC. 175 mg/l chloride, nor 1 mg/l boron. Other requirements also apply. An exception from the EC and/or the chloride limit for agricultural drainage discharged to surface waters may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.

**Revise Page IV-10 of the Tulare Lake Basin Plan under the heading of "Discharges to Navigable Waters" in the "Municipal and Domestic Wastewater" section, as follows:**

- The maximum electrical conductivity (EC) of a discharge shall not exceed the quality of the source water plus 500 micromhos per centimeter or 1,000 micromhos per centimeter, whichever is more stringent. When the water is from more than one source, the EC shall be a weighted average of all sources.

- Discharges shall not exceed an EC of 1,000 micromhos per centimeter, a chloride content of 175 mg/l, or a boron content of 1.0 mg/l.

- An exception from the EC and/or the chloride limitations identified here may be granted for municipal and domestic wastewater discharges to navigable waters if a variance is granted pursuant to the *Variance Policy for Surface Water*.

**Revise Page IV-11 of the Tulare Lake Basin Plan under the heading of "Discharges to Land" in the "Municipal and Domestic Wastewater" section, as follows:**

- The incremental increase in salts from use and treatment must be controlled to the extent possible. In most circumstances, ~~T~~the maximum EC shall not exceed the EC of the source water plus 500 micromhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources. However, under certain circumstances, the Regional Board, upon request of the discharger, may adopt an effluent limit for EC that allows EC in the effluent to exceed the source water by more than 500 µmhos/cm. This request will be granted consistent with the Policy for Exception from Implementation of Water Quality Objectives for Salinity.

- In the Poso Creek Subarea, discharges shall not exceed 1,000 micromhos/cm EC, 200 mg/l chlorides, and 1.0 mg/l boron. …

- In the White Wolf Subarea, for areas overlying Class I irrigation water, discharges shall not exceed 1,000 umhos/cm EC, 175 mg/l chlorides; 60 percent sodium, and 1.0 mg/l boron. For areas overlying Class II or poorer irrigation water, discharges shall not exceed 2,000 umhos/cm EC, 350 mg/l chlorides, 75 percent sodium, and 2 mg/l boron. In areas where ground water would be Class I except for the concentration of a specific constituent, only that constituent will be allowed to exceed the specified limits for Class I water. In no case shall any constituent be greater than those limits specified for areas overlying Class II irrigation water. …

- Discharges to areas that may recharge to good quality ground waters shall not exceed an EC of 1,000 micromhos per centimeter, a chloride content of 175 mg/l, or a boron content of 1.0 mg/l.

- <u>An exception from the EC and/or the chloride limit for discharges to land may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.</u>

**Revise Page IV-13 of the Tulare Lake Basin Plan under the heading of "Industrial Wastewater", as follows:**

Generally, the effluent limits established for municipal waste discharges will apply to industrial wastes. Industrial dischargers shall be required to:

5. Limit the increase in EC of a point source discharge to surface water or land to a maximum of 500 umhos/cm. A lower limit may be required to assure compliance with water quality objectives.

   An exception to this EC limit may be permitted for industrial sources when the discharger technically demonstrates that allowing a greater net incremental increase in EC will result in lower mass emissions of salt and in conservation of water, provided that beneficial uses are protected.

   An exception may also be permitted for food processing industries that discharge to land and exhibit a disproportionate increase in EC of the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids from the raw food product, provided that beneficial uses are protected. Exceptions shall be based on demonstration of best available technology and best management practices that control inorganic dissolved solids to the maximum extent feasible.

   Cull fruits and wastes from food processing generally are voluminous and may have a high water content like winder wastes. Provision should be made for thin spreading of such materials on the fields, followed promptly by disking into the soil.

An exception from the EC limit may also be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity.*

**Revise Page IV-15 of the Tulare Lake Basin Plan under the heading of "Oil Field Wastewater" in the "Industrial Wastewater" section, as follows:**

- Maximum salinity limits for wastewaters in unlined sumps overlying ground water with existing and future probable beneficial uses are 1,000 umhos/cm EC, 200 mg/l chlorides, and 1 mg/l boron, except in the White Wolf subarea where more or less restrictive limits apply. The limits for the White Wolf subarea are discussed in the "Discharges to Land" subsection of the "Municipal and Domestic Wastewater" section.

- Discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the discharger successfully demonstrates to the Regional Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

- An exception from the EC and/or the chloride limit may be permitted consistent with the *Program for Exception from Implementation of Water Quality Objectives for Salinity*.

# 6 CONSISTENCY WITH OTHER LAWS, PLANS AND POLICIES

Any proposed changes to the Regional Water Board Basin Plans must be consistent with existing federal and state laws and regulations including adopted State and Regional Water Board policies. Water Code section 13146 requires that, in carrying out activities that affect water quality, all state agencies, departments, boards and offices comply with state policy for water quality control unless otherwise directed or authorized by statute, in which case they shall indicate to the State Water Board in writing their authority for not complying with such policy. This chapter summarizes existing federal and state laws and policies that are relevant to the proposed Basin Plan Amendments.

## 6.1 Antidegradation Analysis

Both USEPA (40 CFR § 131.12) and the State of California (State Water Board Resolution 68-16) have adopted antidegradation policies as part of their approach to regulating water quality. The Central Valley Water Board must ensure that its actions are consistent with the federal or State antidegradation policies. This section of the Staff Report analyzes whether approval of the proposed Amendments would be consistent with the federal and State antidegradation policies.

### *6.1.1 Federal Antidegradation Policy*

The Federal Antidegradation Policy (40 CFR § 131.12) states:

> "(a) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:
>
> (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
>
> (2) Where the quality of the waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further,

the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act."

In order to protect the existing instream uses, the proposed *Variance Policy* and *Salinity Variance Program* require permit conditions that include interim effluent limitations based on the current achievable effluent quality. In addition, the proposed *Variance Policy* requires the preparation and implementation of a pollution prevention plan and the proposed salinity variance program requires the implementation of a Salinity Reduction Study Work Plan. The implementation of pollution prevention plans and Salinity Reduction Study Work Plans are expected to result in overall improvement in effluent quality. Therefore, the existing use will be protected and increased degradation is not allowed during the term of a variance.

The proposed *Variance Policy* allows the Central Valley Water Board to set an interim effluent limitation that is higher than the current level of the constituent in the effluent to account for drought, water conservation or water recycling efforts. Since efforts to address drought, water conservation and water recycling are mandated by the state (Wat. Code, § 10608 et seq.; § 13550 et seq.; California. 2010. (20x20 Plan); CVRWQCB. 2009. (Resolution R5-2009-0028); SWRCB.2008. (Strategic Plan, Priority 3, pp. 21-25)), these efforts are important social development, and water quality degradation associated with these efforts should be accommodated.

To justify a higher effluent limitation, the application must include documentation to show that the proposed interim effluent limitation is the result of drought, water conservation or water recycling efforts, will not adversely affect beneficial uses, is consistent with federal and state antidegradation policies, and is consistent with anti-backsliding provisions in section 402(o) of the Clean Water Act.

The proposed Amendments are consistent with the federal antidegradation policy because degradation will not be allowed except to accommodate important economic or social development and the discharger is required to implement feasible measures to reduce the levels of the constituent in the effluent.

### *6.1.2 State Antidegradation Policy*

Antidegradation provisions of State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California") state, in part:

> "(1) Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.
>
> (2) Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet WDRs which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

To maintain the existing quality of water, the variance and exception conditions specify that the permits, WDRs, and conditional waivers will include an interim performance-based effluent limitation. In addition dischargers will be required to implement pollution prevention plans, Salinity Reduction Study Work Plans or salinity-based watershed management plans. Implementation of these plans is expected to result in water quality improvement.

Applicants are required to provide information on methods for removing or reducing concentrations and loadings of pollutants and to include plans for implementing the reasonable methods in pollution prevention plans, Salinity Reduction Study Work Plans or salinity-based watershed management plans. The approved plans represent the best practicable treatment or control and the Central Valley Water Board will require implementation of these plans in the resulting NPDES permits, WDRs, or conditional waivers.

Under the *Variance Policy* and the *Salinity Exception Program*, the Central Valley Water Board will be able to consider setting the interim effluent limitation at a level higher than the current level of the constituent in the effluent to account for drought, water conservation or water recycling efforts. The applicant for the variance or the exception will be required to provide documentation of the effect of these efforts on the quality of the effluent and/or receiving waters. Since efforts to address drought, water conservation and water recycling are mandated by the state (Wat. Code, § 10608 et seq.; § 13550 et seq.; California. 2010. (20x20 Plan); CVRWQCB. 2009. (Resolution R5-2009-0028); SWRCB.2008. (Strategic

Plan, Priority 3, pp. 21-25)), these efforts should be considered to be consistent with maximum benefit to the people of the State, and water quality degradation associated with these efforts should be accommodated.

Further analysis of the effect of allowing variances will be provided with future variance applications. The remainder of this discussion analyzes the salinity programs (i.e., the *Salinity Variance Program* and the *Salinity Exception Program*).

In addition, to requiring development and implementation of a Salinity Reduction Study Work Plan or a salinity-based watershed management plan, the salinity programs require that the applicant document participation in CV-SALTS. The resulting NPDES permit, WDRs, or conditional waivers will require that the applicant actively participate in CV-SALTS to help develop and implement a comprehensive salt and nitrate plan that will be submitted to the Central Valley Water Board by May 2016 and be the basis for amendments to the Basin Plans by May 2017.

There is a difference in water quality between allowing a variance and not allowing a variance. This difference is the incremental improvement in ambient water quality if there were no variance and the discharger was required to meet water quality based effluent limitations. A technical memorandum from Larry Walker and Associates (2012., pp. 23 to 47, section V.) contains an analysis of the incremental improvements if the case studies achieved water quality based effluent limitations. For the Delta communities, the improvements in local EC concentrations of the receiving waters in the vicinity of the discharges ranged from 0.31% to 2.68%. Analysis conducted of the ambient water further away from the discharges indicated that there were no measurable effects. For the City of Fresno, the difference in groundwater quality if an exception is not allowed is potential improvement of the down gradient groundwater by 4-6% or about 40 µmhos/cm. As noted in section 4.5.3, beneficial uses continue to be protected through a broad salinity range. Based on the case study analyses that have been performed, the salinity changes, if any, are small and have minimal effects on beneficial uses, therefore the salinity programs are not expected to unreasonably affect present or anticipated beneficial uses of waters.

The proposed salinity programs delay implementing end-of-pipe treatment or reverse osmosis for affected dischargers. Reverse osmosis is typically very expensive, energy intensive and results in a brine (10 to 20 percent of the waste stream) that must be properly disposed. The energy consumption of reverse osmosis and the brine waste stream are environmental impacts that must be considered when planning and designing reverse osmosis. (SWRCB. 2005., p 12.) LWA 2012 estimated the amount of carbon dioxide emissions that would result if the cities of Tracy, Stockton, Manteca and Fresno implemented reverse osmosis technology. More details of the analysis are described in the Greenhouse Gas Emissions section of the Environmental Checklist. (Appendix A, section VII.) While the increased emissions per capita are very small, they are increases and are, therefore, inconsistent with the statewide mandate to reduce carbon dioxide emissions. Additionally, as explained above, implementing treatment to achieve the water quality based effluent limitations do not provide significant improved ambient water quality. Therefore, the potential increased greenhouse gas emissions of implementing reverse osmosis technology coupled with the lack of water quality improvement are not consistent with the best interest of the people of the State.

The proposed Amendments require imposition of an interim performance-based effluent limitation which will maintain the water quality. The proposed Amendments also contain provisions for the Board to include requirements to develop and implement pollution prevention plans, Salinity Reduction Study Work Plans and salinity-based watershed management plan in NPDES permits, WDRs, and conditional waivers. These plans are considered to be best practicable treatment and control for salinity constituents since they include consideration of all measures short of end-of-pipe treatment. Across all the applicants, implementation of these provisions is expected to result in water quality improvements over the term of the variance or the exception. The discharger will be required to meet the applicable water quality based effluent limitations and the applicable water quality objectives at the end of the term of the variance or exception.

The proposed salinity programs are consistent with maximum benefit to the people of the state because they avoid greenhouse gas emissions that would result from reverse osmosis technology that would not significantly improve ambient water quality. The proposed Amendments limit water quality degradation by setting an interim performance-based effluent limitation. The proposed Amendments allow the Central Valley Water Board to consider an interim effluent limitation that is higher than the current level established for a constituent when there is a need to address drought, water conservation and/or water recycling in order to be consistent with maximum benefit to the people of the state. Therefore, the proposed Amendments are consistent with the State Water Board *Antidegradation Policy*.

## 6.2 Consistency with Federal and State Laws and Regulations

Federal and state agencies have adopted regulations implementing federal and state laws to which Central Valley Water Board actions must conform. The following federal and state laws are relevant to the proposed Basin Plan Amendments:

- Antidegradation Policy (40 CFR § 131.12)
- Clean Water Act
- Federal & State Endangered Species Acts (50 CFR et seq., California Fish and Game Code § 2050-2116 et seq.)

These laws and their relevance to the proposed water quality objectives and implementation plan are described in the following sections.

### *6.2.1 Antidegradation Policy*

The consistency with the federal Antidegradation Policy is discussed in Section 6.1.1.

### *6.2.2 Clean Water Act*

Under section 303(c) of the Clean Water Act, water quality standards adopted by a State are subject to USEPA approval. Title 40 Code of Federal Regulations section 131.13 identifies variance policies as a part of a state's water quality standards and subject to USEPA approval. The variance provisions will be submitted for USEPA approval if they are adopted by the Central Valley Water Board and approved by the State Water Board and the Office of Administrative Law. In addition, individual variances that are considered to be water quality standards actions will also be submitted to USEPA for review and approval before they become effective.

### *6.2.3 Federal & State Endangered Species Act*

The Federal Endangered Species Act of 1973 (50 CFR *et seq*.) was established to identify, protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Interior Department's U.S. Fish and Wildlife Service (USFWS) and the Department of Commerce's National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the NMFS has primary responsibility for marine species such as salmon and whales. In addition, the State of California enacted the California Endangered Species Act (California Fish and Game Code, sections 2050-2116 *et seq*.), which is administered by the California Department of Fish and Wildlife and similarly maintains State lists of rare, threatened and endangered species.

The proposed Basin Plan Amendments provide for a short-term exception from meeting water quality based effluent limitations for non-priority pollutants. However, while fish and wildlife may be sensitive to certain non-toxic chemical constituents, the policy requires that the current effluent quality be maintained or improved by imposing an interim performance-based effluent limitation and requiring the development and implementation of a pollution prevention plan or a Salinity Reduction Study Work Plan. If the variance applicant thinks that they need to discharge a higher concentration, the applicant will need to demonstrate that the beneficial uses will continue to be protected. Therefore, the proposed Basin Plan Amendments are not expected to affect fish and wildlife and the

Endangered Species Act is not expected to be applicable to the proposed Basin Plan Amendments.

### *6.2.4 Water Quality Variances*

Title 40 Code of Federal Regulations section 131.13 identifies variances as water quality standards actions subject to USEPA approval. USEPA has approved variances that include specific elements. (USEPA. 1994.) The proposed policy addresses each of the elements that USEPA expects to see included in variance applications and policies. The following lists the USEPA elements verbatim as found in USEPA guidance (underlined italics). Following each element is the staff summary of the provisions in the proposed policy that address each element:

A. *each individual variance is included as part of the water quality standard;*

   The *Variance Policy* and *Salinity Variance Program* will be adopted through a basin planning process and incorporated into the Basin Plans after final approval.

B. *the State demonstrates that meeting the standard is unattainable based on one or more of the grounds outlined in 40 Code of Federal Regulations section 131.10(g)*;

   The *Variance Policy* specifies that variances may be approved if the permittee demonstrates that one of the 40 CFR 131.10(g) factors are met (Section I.C.) The *Salinity Variance Program* is for dischargers that cannot meet water quality based effluent limitations consistent with the factors in 40 CFR 131.10(g)(3) and/or (6) as described in section 4.5.2.

C. *the justification submitted by the State includes documentation that treatment more advanced than that required by sections 303(c)(2)(A) and (B) of the Clean Water Act has been carefully considered, and that alternative effluent control strategies have been evaluated*;

   The *Variance Policy* requires that applicants identify methods to remove or reduce pollutant loads and/or concentrations and to document removal of the pollutant to the maximum extent ~~possible~~feasible. Under the *Salinity Variance Program*, the staff report demonstrates that POTWs control salinity through source control (industrial controls, residential controls and changing municipal water supply) or end-of-pipe treatment. End-of-pipe treatment is salt removal technology and reverse osmosis is the most appropriate end-of-pipe treatment for POTWs.

D. *the more stringent State criterion is maintained and is binding upon all other dischargers on the stream or stream segment*;

The policy specifies that the variance is for a single discharger and only for the constituents identified in the approved variance. (Section I.G)

E. *the discharger who is given a variance for one particular constituent is required to meet the applicable criteria for other constituents*;

The policy specifies that the variance is only for the constituents identified in the approved variance. (Section I.G)

F. *the variance is granted for a specific period of time and must be rejustified upon expiration but at least every 3 years*;

Both the *Variance Policy* and *Salinity Variance Program* include a variance term and include provisions for reviewing variances during triennial reviews. (Section I.H. and Sections II.L. and III.I.)

G. *the discharger either must meet the standard upon the expiration of this time period or must make a new demonstration of "unattainability"*;

The *Variance Policy* and *Salinity Variance Program* include provisions that compliance with the water quality based effluent limitations are required upon the expiration of the variance (Section II.G.1 and III.F.1) and renewal provisions that require the same justification as the original application plus demonstration of compliance with the conditions of the previous variance. (Section II.J. and III.H.)

*H. reasonable progress is being made toward meeting the standards; and*

The *Variance Policy* requires preparation and implementation of a pollution prevention plan. (Section II.G.2.) The *Salinity Variance Program* requires a development and implementation of Salinity Reduction Study Work Plan. (Section III.C.5 and III.F.2) Pollution prevention plans and Salinity Reduction Study Work Plans must include plans to implement cost-effective control methods which are expected to result in overall water quality improvements. In addition, under the salinity variance program, dischargers will be required to participate in the development of the SNMPs through CV-SALTS. Ultimately, the SNMPs are expected to include regulatory approaches that result in requirements which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities and others. (Section III.C.10 and III.F.3).

*l.* *the variance was subjected to public notice, opportunity for comment, and public hearing. (USC § 1313(c)(l) and 40 CFR § 131.20.) The public notice should contain a clear description of the impact of the variance upon achieving water quality standards in the affected stream segment.*

The *Variance Policy* and *Salinity Variance Program* will be adopted through a basin planning process. Individual variances will go through a public hearing. (Section II.F. and III.E.)

### 6.3 Consistency with State Water Board Plans and Policies

The State Water Board is authorized to adopt state policy for water quality control. (Wat. Code § 13140.) State Water Board water quality control plans supersede any regional water quality control plans for the same waters to the extent of any conflict. (Wat. Code § 13170.) Regional water quality control plans must conform to State Water Board policies. (Wat. Code § 13240.) The following are the State Water Board plans and policies applicable to the proposed Basin Plan Amendments:

- *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan)*
- *Statement of Policy with Respect to Maintaining High Quality of Water in California (Antidegradation Policy)* (Resolution No. 68-16)
- *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan)*
- *Water Quality Control Policy for the Enclosed Bays and Estuaries of California* (Resolution No. 74-43)
- *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling* (Resolution 75-58)
- *Policy and Action Plan for Water Reclamation in California* (Resolution 77-1) and *Policy for Water Quality Control for Recycled Water* (Resolution 2009-0011)
- *Policy on the Disposal of Shredder Waste* (Resolution 87-22)
- *Policy regarding the Underground Storage Tank Pilot Program* (Resolution 88-23)
- *Sources of Drinking Water Policy* (Resolution 88-63)
- *Pollutant Policy Document* (Resolution 90-67)
- *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* (Resolution 92-49)

- *Policy for Regulation of Discharges of Municipal Solid Waste* (Resolution 93-62)
- *Consolidated Toxic Hot Spots Cleanup Plan* (Resolutions 99-065 and 2004-0002)
- *Nonpoint Source Management Plan* & the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (Resolutions 99-114 and 2004-0030)
- *Water Quality Enforcement Policy* (Resolution 2002-0040)
- *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (Resolution 2005-0019)
- *Policy for Developing California's Clean Water Act Section 303(d) List* (Resolution 2004-0063)
- *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options* (Resolution. 2005-0050)
- *Policy for Compliance Schedules in Nation Pollutant Discharge Elimination System Permits* (Resolution 2008-0025)
- *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems* (Resolution 2012-0032)

These policies and their relevance to the proposed water quality objectives and implementation plan are described in the following sections.

### *6.3.1 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan)*

The State Water Board adopted the *Bay-Delta Plan* which supersedes the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* to the extent of any conflicts. The *Bay-Delta Plan* includes water quality objectives for chlorides, dissolved oxygen and EC; these objectives supersede the water quality objectives in the Basin Plans to the extent of any conflict. The Central Valley Water Board is responsible for the regulation of waste discharges to achieve these objectives.

Staff proposes to amend the two Central Valley Basin Plans but not the Bay-Delta Plan to include implementation provisions for the *Variances from Surface Water Quality Standards for Point Source Dischargers*, *Variance Program for Salinity*, and *Exception from Implementation of Water Quality Objectives for Salinity*. The implementation programs in the Basin Plans will be used to implement water quality standards contained in the *Bay-Delta Plan*.

### *6.3.2 Resolution 68-16: Statement of Policy with Respect to Maintaining High Quality of Water in California (Antidegradation Policy)*

The *Antidegradation Policy* includes the following statements:

"1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

"2. Any activity which produces or may produce a waste or increase volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet WDRs which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

This Policy incorporates the federal antidegradation standards for surface waters (Section 6.1.1). As discussed in Section 6.1.1 and 6.1.2, the proposed Basin Plan Amendments are consistent with both the federal and state antidegradation policies.

### *6.3.3 Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan)*

The *Thermal Plan* specifies water quality objectives, effluent quality limitations, and discharge prohibitions related to thermal characteristics of interstate waters and waste discharges. The *Thermal Plan* allows the regional water boards, with the concurrence of the State Board, in accordance with Clean Water Act section 316(a), to grant an exception from the specific water quality objectives contained in the plan. The proposed Basin Plan Amendments will not apply to temperature; therefore, the *Thermal Plan* is not applicable to the proposed Basin Plan Amendments.

### *6.3.4 Resolution 74-43: Water Quality Control Policy for the Enclosed Bays and Estuaries of California*

This Policy was adopted by the State Water Board in 1974 and provides water quality principles and guidelines for the prevention of water quality degradation in enclosed bays and estuaries to protect the beneficial uses of such waters. The Regional Water Boards must enforce the policy and take actions consistent with its provisions. For the San Francisco Bay-Delta system, the policy requires implementation of a program which controls toxic effects through a combination of source control for toxic materials, upgraded waste treatment, and improved dilution of wastewaters to provide full protection to the biota and the beneficial uses of San Francisco Bay-Delta waters.

The proposed Basin Plan Amendments affect non-toxic pollutants; therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

### *6.3.5 Resolution 75-58: Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling*

This Policy provides consistent principles and guidance for supplementary WDRs or other water quality control actions for thermal powerplants using inland waters for cooling.

The Policy prohibits land discharge except to salt sinks or lined facilities approved by the Regional and State Boards. The policy also requires that regional water boards adopt WDRs for discharges from powerplant cooling facilities which specify allowable mass emission rates and/or effluent concentrations and the water quality conditions to be maintained in the receiving waters.

The proposed Basin Plan Amendments would not change the siting requirement for land disposal but could allow a variance from meeting the surface water quality objectives if the discharger successfully applies for a variance under the general variance authority. During the term of the variance, the WDRs will include an interim effluent limitation, and dischargers will be expected to develop and implement pollution prevention plans and work towards attaining the water quality standard for the water body as a whole. These variance conditions are similar to the requirements in the policy so the proposed Basin Plan Amendments are consistent with this Policy.

### *6.3.6 Resolution 77-1: Policy and Action Plan for Water Reclamation in California and Resolution 2009-0011: Policy for Water Quality Control for Recycled Water*

These Policies establish consistent and predictable requirements in order to increase the use of recycled water in California. Resolution 2009-0011 establishes mandates for the use of recycled water; requires the development by stakeholders and the adoption by Regional Water Boards of regional salt/nutrient management plans; establishes requirements for regulating incidental runoff from landscape irrigation with recycled water; establishes criteria and procedures for recycled water landscape irrigation projects eligible for streamlined permitting; establishes procedures for permitting groundwater recharge projects; establishes procedures for implementing State Water Board Resolution No. 68-16, "*Statement of Policy with Respect to Maintaining High Quality of Waters in*

*California*" for recycled water projects; requires the establishment of a scientific advisory panel to advise the State Water Board on regulation of constituents of emerging concern; and establishes actions and incentives to promote the use of recycled water.

The purpose of the proposed Basin Plan Amendments is to support the development of the salt and nitrate management plans called for in Resolution 2009-0011 through CV-SALTS. Therefore, the Amendments are consistent and support the need to develop and use recycled water.

### *6.3.7 Resolution 87-22: Policy on the Disposal of Shredder Waste*

This Policy permits the disposal into certain landfills of wastes, produced by the mechanical destruction of car bodies, old appliances and similar castoffs, under specific conditions designated and enforced by the Regional Water Boards. The proposed amendments do not apply to shredder waste; therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

### *6.3.8 Resolution 88-23: Policy regarding the Underground Storage Tank Pilot Program*

This Policy implements a pilot program to fund oversight of remedial action at leaking underground storage tank sites, in cooperation with the California Department of Health Services. Oversight may be deferred to the Regional Water Boards. The proposed Basin Plan Amendments do not apply to the oversight of remedial actions at leaking underground storage tank sites; therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

### *6.3.9 Resolution 88-63: Sources of Drinking Water Policy*

This policy states that all waters of the state are to be protected as existing or potential sources of municipal and domestic supply water. The proposed amendments do not modify any of the beneficial uses of water so this Policy is not applicable to the proposed Basin Plan amendments.

### *6.3.10 Resolution 90-67: Pollutant Policy Document*

This Policy requires, in part, that the Central Valley and San Francisco Bay Water Boards use the *Pollutant Policy Document* (PPD) as a guide to update portions of their Basin Plans. The PPD requires that the Central Valley Water Board develop a *Mass Emissions Strategy* (MES) for limiting loads of pollutants from entering the Sacramento-San Joaquin Delta. The purpose of the MES is to control the accumulation in sediments and the bioaccumulation of pollutant substances in the tissues of aquatic organisms in accordance with the statutory requirements of the state Porter-Cologne Water Quality Act and the federal Clean Water Act.

The pollutants of concern covered under this policy are toxic pollutants that are addressed by the CTR and the SIP. The proposed Basin Plan Amendments apply to pollutants that are not covered by the CTR and the SIP; therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

#### *6.3.11 Resolution 92-49: Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*

This Policy contains procedures for the Central Valley Water Board to follow for oversight of cleanup projects to ensure cleanup and abatement activities protect the high quality of surface and groundwater. The proposed Basin Plan Amendments do not include any requirement for cleanup and abatement activities; therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

#### *6.3.12 Resolution 93-62: Policy for Regulation of Discharges of Municipal Solid Waste*

This Policy directs Regional Water Boards to amend WDRs for municipal solid waste landfills to incorporate pertinent provisions of the federal "Subtitle D" regulations under the Resource Conservation and Recovery Act (40 CFR parts 257 & 258). The provisions address design of landfills and containment systems. Regional Water Boards have discretion to prescribe less stringent requirements when beneficial uses of ground water will not be affected. The proposed Basin Plan Amendments allow a delay in meeting water quality objectives for salinity but do not affect the design of landfills and containment systems. Therefore, this Policy is not applicable to the proposed Basin Plan Amendments.

#### *6.3.13 Resolution 99-065 & Resolution 2004-0002: Consolidated Toxic Hot Spots Cleanup Plan*

In June 1999, the State Water Board adopted the *Consolidated Toxic Hot Spots Cleanup Plan* (*Cleanup Plan*), as required by California Water Code section 13394. The Regional Water Board Toxic Hot Spots Clean-up Plan identified the following hot spots in the Central Valley:

- Mercury in the entire Delta and the Cache Creek watershed including Clear Lake
- Low dissolved oxygen concentrations in the San Joaquin River in the vicinity of the City of Stockton
- Diazinon from orchard dormant spray runoff in the entire Delta

- Diazinon and chlorpyrifos from urban stormwater runoff in Morrison Creek in the City of Sacramento and Mosher Slough, 5 Mile Slough, the Calaveras River, and Mormon Slough in the City of Sacramento
- Chlorpyrifos from irrigation tailwater in French Camp Slough, Duck Slough, Paradise Cut and Ulatis Creek.

Water Code section 13395 requires the reevaluation of WDRs for dischargers who have discharged pollutants causing all or part of the toxic hot spot to include requirements that prevent the maintenance or further pollution of existing hot spots.

The proposed Basin Plan Amendments allow permittees to apply for a variance from water quality based effluent limitations for non-priority pollutants. Mercury is a priority pollutant and a variance for mercury will not be part of the Regional Board's authority. However, dissolved oxygen, diazinon and chlorpyrifos are not priority pollutants so permittees will be able to apply for a variance from meeting water quality based effluent limitations for these constituents. However, the permittee will be required to demonstrate that meeting the water quality based effluent limitation is infeasible based on one or more of the factors listed in 40 Code of Federal Regulations section 131.10(g). In addition, the permit will include an interim effluent limitation that is determined to be attainable during the permit term, a requirement to prepare a pollution prevention plan, and appropriate conditions requiring reasonable progress be made towards attaining the water quality standard for the water body as a whole. The proposed variance requirements are consistent with the concept of preventing the maintenance or further pollution of existing hot spots; therefore, the proposed Basin Plan Amendments are consistent with this Policy.

### *6.3.14 Resolution 99-114 & Resolution 2004-0030: Nonpoint Source Management Plan & the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program*

In December 1999, the State Water Board adopted the *Plan for California's Nonpoint Source (NPS) Pollution Control Program* (*NPS Program Plan*) and in May 2004, the State Water Board adopted the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (*NPS Policy*). The *NPS Policy* explains how State and Regional Water Boards will use their planning and waste discharge regulation authority under the Porter-Cologne to implement and enforce the NPS Program Plan. The *NPS Policy* requires all nonpoint source discharges to be regulated under WDRs, waivers of WDRs, a Basin Plan prohibition, or some combination of these administrative tools. The *NPS Policy* also describes the key elements that must be included in a nonpoint source implementation program.

Nonpoint source dischargers are not subject to NPDES permits; therefore, the variance provisions in the proposed Basin Plan Amendments will not apply for these dischargers. However, the proposed Basin Plan Amendments provide a procedure for obtaining an exception from applying water quality objectives for salinity in WDRs and conditional waivers. Since this policy requires that nonpoint source dischargers be regulated under WDRs, waivers of WDRs or Basin Plan Prohibitions but does not specify requirements to be included, the Policy does not apply to the proposed Basin Plan Amendments.

### *6.3.15 Resolution 2002-0040: Water Quality Enforcement Policy*

The State Water Board adopted this Policy to ensure enforcement actions are consistent, predictable, and fair. The Policy creates a framework for identifying and investigating instances of noncompliance, for taking enforcement actions that are appropriate in relation to the nature and severity of the violation, and for prioritizing enforcement resources to achieve maximum environmental benefits.

The proposed Basin Plan Amendments allow a short-term exception from meeting water quality based effluent limitations for non-priority pollutants. During the term of the exception, interim effluent limitations will apply. Violation of the interim effluent limitations would result in enforcement actions as directed by this Policy. Therefore, the proposed Basin Plan Amendments are consistent with this Policy.

### *6.3.16 Resolution 2005-0019: Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (a.k.a. State Implementation Plan or SIP) applies to discharges of toxic pollutants into the inland surface waters, enclosed bays, and estuaries of California subject to regulation under the Porter-Cologne Water Quality Control Act and the federal Clean Water Act. Regulation of priority toxic pollutants may occur through the issuance of NPDES permits or other regulatory approaches. The goal of the SIP is to establish a statewide, standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters. The State Water Board also developed procedures for case-by-case exceptions from meeting a priority pollutant criterion/objective. The State Water Board procedures recognized that USEPA would independently review the exception request so the procedures included steps that USEPA would need but were not necessary for the State's review. The procedures have a specific application requirement.

The SIP applies to priority pollutants while the proposed Basin Plan Amendments apply to non-priority pollutants. Therefore, the SIP does not apply to the proposed Basin Plan Amendments.

### *6.3.17 Resolution 2004-0063: Policy for Developing California's Clean Water Act Section 303(d) List*

Pursuant to the Water Code section 13191.3(a), this State policy for water quality control describes the process by which the State Water Board and the Regional Water Boards will comply with the listing requirements of Clean Water Act section 303(d). The *Listing Policy* establishes a standardized approach for developing California's section 303(d) list to achieve water quality standards and maintain beneficial uses in all of California's surface waters. The *Listing Policy* applies only to the listing process methodology used to comply with Clean Water Act section 303(d).

Clean Water Act section 303(d) requires states to identify waters that do not meet, or are not expected to meet by the next listing cycle, applicable water quality standards after the application of technology-based controls specified in sections 301(b)(1)(A) and 301(b)(1)(B) of the Clean Water Act and schedule such waters for development of TMDLs (40 CFR § 130.7(c) and (d)).

The proposed Basin Plan Amendments consist of a policy to allow variances from meeting water quality based effluent limitations. The proposed Amendments do not change any water quality standards or their interpretation for purposes of identifying waters that do not meet, or are not expected to meet the applicable water quality standards by the next listing cycle. However, the proposed Basin Plan Amendments will impose permit requirements that may improve the quality of the effluent discharge and water quality in the receiving water body as a whole. Consistent with this Policy, any improvements in water quality will need to be considered in determining if the waters will or will not meet the applicable water quality standards by the next listing cycle. Therefore, the proposed Basin Plan Amendments are consistent with this Policy.

### *6.3.18 Resolution 2005-0050: Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options*

The State Water Board's *Impaired Waters Policy* incorporates the following:

- Clean Water Act section 303(d) identification of waters that do not meet applicable water quality standards and prioritization for TMDL development;
- Water Code section 13191.3(a) requirements to prepare guidelines to be used by the Regional Water Boards in listing, delisting, developing, and implementing TMDLs pursuant to Clean Water Act section 303(d); and
- Water Code section 13191.3(b) requirements that State Water Board considers consensus recommendations adopted by the 2000 Public Advisory Group when preparing guidelines.

The *Impaired Waters Policy* includes the following statements:

"A. If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body.

B. If the failure to attain standards is due to the fact that the applicable standards are not appropriate to natural conditions, an appropriate regulatory response is to correct the standards.

C. The State Water Board and Regional Water Boards are responsible for the quality of all waters of the state, irrespective of the cause of the impairment. In addition, a TMDL must be calculated for impairments caused by certain EPA designated pollutants.

D. Whether or not a TMDL calculation is required as described above, impaired waters will be corrected (and implementation plans crafted) using existing regulatory tools.

D1. If the solution to an impairment will require multiple actions of the Regional Water Board that affect multiple persons, the solution must be implemented through a Basin Plan amendment or other regulation.

D2. If the solution to an impairment can be implemented with a single vote of the Regional Water Board, it may be implemented by that vote.

D3. If a solution to an impairment is being implemented by a regulatory action of another state, regional, local, or federal agency, and the Regional Water Board finds that the solution will actually correct the impairment, the Regional Water Board may certify that the regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program.

D 4. If a solution to an impairment is being implemented by a non-regulatory action of another entity, and the Regional Water Board finds that the solution will actually correct the impairment, the Regional Water Board may certify that the non-regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program."

The proposed Basin Plan Amendments allow a temporary variance from meeting water quality based effluent limitations but it does not change the impairment status of a water body, or the need to address the impairment. However, the proposed Basin Plan Amendments will provide a new regulatory tool that may be used in the programs that implement TMDLs. Therefore, the proposed Basin Plan Amendments are consistent with this Policy.

### *6.3.19 Resolution 2008-0025: Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*

The *Compliance Schedule Policy* authorizes the Regional Water Board to include a compliance schedule in a permit for an existing discharger to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed.

The proposed Basin Plan Amendments recognize that compliance schedules are not appropriate in all cases and establish policy and procedures for situations that are not subject to compliance schedules. Therefore the *Compliance Schedule Policy* is not applicable to the proposed Basin Plan Amendments.

### *6.3.20 Resolution 2012-0032: Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems*

This Policy allows the continued use of onsite wastewater treatment systems (OWTS) while protecting water quality and public health. The policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS. One of the tiers is based on water body impairment due to pathogens or nitrogen.

The proposed Basin Plan Amendments allow dischargers the ability to apply for a variance for NPDES dischargers and an exception from implementation of water quality objectives for salinity for dischargers subject to WDRs and conditional waivers. Since the *OWTS Policy* does not include water quality objectives, the Policy is not applicable to the proposed Basin Plan Amendments.

## 6.4 Consistency with Central Valley Regional Water Quality Board Policies

The following are the Central Valley Water Board policies:

- *Urban Runoff Policy*
- *Wastewater Reuse Policy*
- *Controllable Factors Policy*
- *Water Quality Limited Segment Policy*
- *Antidegradation Implementation Policy*
- *Application of Water Quality Objectives Policy*
- *Watershed Policy*

These policies are identified as specific policies in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins but are included in text in the Water Quality Control Plan for the Tulare Lake Basin. These policies and their relevance to the proposed implementation plan are described in the following sections.

### *6.4.1 Urban Runoff Policy*

The Policy requires the issuance of WDRs on the discharge of urban runoff when a threat to water quality exists.

The proposed Basin Plan Amendments do not change the need to assess the water quality impacts of urban runoff or to address identified water quality impacts but the proposed Basin Plan Amendments provide a procedure to allow a variance from meeting water quality based effluent limitations in NPDES permits or a short-term exception from implementation of water quality objectives for salinity in WDRs and conditional waivers. During the term of a variance or the exception, dischargers will be expected to develop and implement pollution prevention programs and to work towards achieving the water quality standards in the water body as a whole. Therefore the proposed Basin Plan Amendments are consistent with this Policy.

### *6.4.2 Wastewater Reuse Policy*

This Policy encourages reclamation and reuse of wastewater by requiring an evaluation of reuse and land disposal options as part of a Report of Waste Discharge. In the Water Quality Control Plan for the Tulare Lake Basin, there is an additional requirement to regulate the quality of waste discharges to promote reclamation and reuse wherever feasible.

The proposed Basin Plan Amendments allow a short-term exception from meeting water quality based effluent limitations and from meeting salinity effluent limitations and application procedures are provided for obtaining the exception. The proposed Basin Plan Amendments do not change any of the requirements in a Report of Waste Discharge. In addition, the purpose of the proposed Basin Plan Amendments is to allow time for CV-SALTS to develop the salt and nutrient management plans required by the Recycled Water Policy as discussed in Section 6.3.6. Therefore, the Basin Plan Amendments are consistent with the *Wastewater Reuse Policy* and support the need to develop and use recycled water.

### *6.4.3 Controllable Factors Policy*

This Policy specifies that controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. The Policy goes on to define controllable water quality factors as those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Central Valley Water Board, and that may be reasonably controlled.

The proposed Basin Plan Amendments provide provisions for controllable sources to obtain a short-term exception from meeting water quality based effluent limitations and salinity effluent limitations. The proposed provisions include application requirements for the discharger to demonstrate that additional treatment cannot be reasonably controlled. Therefore, the proposed Basin Plan Amendments are consistent with the *Controllable Factors Policy*.

### *6.4.4 Water Quality Limited Segment Policy*

This Policy specifies that additional treatment beyond minimum federal requirements will be imposed on dischargers to water quality limited segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.

The proposed Basin Plan Amendments allow the Central Valley Water Board to grant a variance from meeting water quality based effluent limitations if the permittee demonstrates that a variance is appropriate based on at least one of the factors listed in 40 Code of Federal Regulations section 131.10(g). Under the *Variance Policy*, the permit will include interim effluent limitations based on the current achievable effluent quality and development and implementation of a pollution prevention plan to reduce the effluent concentrations of the pollutant. Under the *Salinity Variance Program*, the permit will include interim effluent limitations based on the current achievable effluent quality and implementation of a Salinity Reduction Study Work Plan. The proposed variances may be used when TMDLs are under development to provide an affected discharger a short-term exception from meeting water quality based effluent limitations that may be inconsistent with the final waste load allocations. Therefore, the proposed Basin Plan Amendments are consistent with this Policy.

### *6.4.5 Antidegradation Implementation Policy*

Consistency of the proposed Basin Plan Amendments with the federal and state antidegradation policies is discussed in Section 6.1.

### *6.4.6 Application of Water Quality Objectives Policy*

This Policy describes how the Central Valley Water Board applies the water quality objectives established in the Basin Plans and how compliance is evaluated.

The proposed Basin Plan Amendments do not change the applicability of water quality objectives nor how compliance is evaluated. Therefore, the Policy is not applicable to the proposed Basin Plan Amendments.

### *6.4.7 Watershed Policy*

This Policy describes the Central Valley Water Board's support for a watershed based approach to addressing water quality problems.

The proposed Basin Plan Amendments provide for a short-term exception from meeting water quality based effluent limitations and salinity effluent limitations. During the term of the exception, dischargers will be expected to work towards achieving the water quality standards for the water body as a whole. Therefore the proposed Basin Plan Amendments are consistent with this Policy by requiring consideration of the watershed and not just the point of discharge.

# 7 ENVIRONMENTAL ANALYSIS

## 7.1 Environmental Impacts of the Proposed Project

The environmental impacts for the proposed project (i.e., the proposed Basin Plan Amendments) are discussed in Appendix A, Environmental Checklist. Based on the environmental evaluation, the proposed Basin Plan Amendments and the reasonably foreseeable means of compliance will not result in any significant environmental impacts, and no mitigation measures are proposed.

## 7.2 Reasonably Foreseeable Methods of Compliance

The Central Valley Water Board is required to perform, at the time it adopts a rule or regulation requiring the installation of pollution control equipment, or a performance standard or treatment requirement, an environmental analysis of the reasonably foreseeable methods of compliance. (Pub. Res. Code, § 21159.)

The proposed Basin Plan Amendments will allow dischargers an opportunity to delay implementation of treatment measures for a short period of time; therefore, the proposed Basin Plan Amendments do not require and it is not reasonably foreseeable that the proposed Basin Plan Amendments would require the installation of pollution control equipment. On the other hand, in the absence of the proposed Basin Plan Amendments, dischargers that would have successfully applied for either a salinity variance or a salinity exception would not have a variance or an exception and would need to start investigating treatment technology to meet effluent limitations for salinity.

# 8 ECONOMIC CONSIDERATIONS

There are three requirements for the Board to consider economics when adopting a basin plan amendment. The first requirement is in Water Code section 13241(d) which requires that the Board consider economics when establishing water quality objectives. The second requirement is Water Code section 13141 which requires that prior to implementation of any agricultural water quality control program, the Board must include an estimated cost of such a program, together with an identification of potential sources of funding, in the basin plan. The third requirement is Public Resources Code section 21159 which requires the Board, when adopting an amendment that will require the installation of pollution control equipment or is a performance standard or treatment requirement, to include an environmental analysis of the reasonably foreseeable methods of compliance. This environmental analysis is required to take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites.

The proposed Basin Plan Amendments allow dischargers to continue the current discharge without implementing additional treatment that would otherwise be required. The proposed Amendments do not include water quality objectives, do not implement an agricultural water quality control program, nor require any additional treatment as a reasonably foreseeable method of compliance. Therefore, the Central Valley Water Board is not required to consider economics when considering the proposed Basin Plan Amendments. However, since economic information regarding impacts of increased salinity as well as costs for implementing reverse osmosis was readily available to staff, this information is summarized below.

A potential impact of allowing salinity variances could be increased salinity in water exported out of the Sacramento-San Joaquin Delta. A 1999 study estimated that the Metropolitan Water District Service Area would realize an economic benefit of $95 million annually if the salinity of the imported water decreased by 100 mg/l. (Bookman-Edmonston. 1999.) If the proposed Basin Plan Amendments did not go forward, the case study cities would need to meet water quality based effluent limitations that would result in estimated salinity reductions that range from 1 to 18 µmhos/cm (0.31% to 2.68%) within the vicinity of the discharge. However, modeling indicates that the effect decreased with distance from the discharge point and there would be no detectable change to EC at the compliance points identified in the Bay-Delta Plan (Old River at Middle River and San Joaquin River at Brandt Bridge). Therefore, the water purveyors that withdraw water from the Delta would realize no economic benefit regardless of whether or not the proposed Basin Plan Amendments go forward. (LWA. 2012., pp. 23-37.)

The following is the estimated costs to the cities used as case studies if reverse osmosis technology was implemented. (LWA. 2012., pp. 53-55, 71-73.)

| ***City*** | ***Order No.*** | ***Facility Design Flow*** | ***Cost ($ Millions)*** |
|---|---|---|---|
| City of Tracy | R5-2012-0115 | 10.8 mgd | 166 |
| City of Stockton | R5-2008-0154 | 55.0 mgd | 523 |
| City of Manteca | R5-2009-0095 | 9.9 mgd | 99 |
| City of Fresno | R5-2001-0254 | 88.0 mgd | 777 |

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# APPENDIX A

# ENVIRONMENTAL CHECKLIST

## Environmental Checklist

*California Environmental Quality Act Requirements*

The Central Valley Regional Water Quality Control Board (Central Valley Water Board or Board), as a Lead Agency under the California Environmental Quality Act (CEQA), is responsible for evaluating all the potential environmental impacts that may occur due to changes made to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and to the Water Quality Control Plan for the Tulare Lake Basin (Basin Plans). (Pub. Resources Code, §21000 et seq.) The Secretary for Natural Resources has determined that the Central Valley Water Board's Basin Planning Process qualifies as a certified regulatory program pursuant to Public Resources Code section 21080.5 and California Code of Regulations, title 14, section 15251(g). This determination means that the Central Valley Water Board's Basin Planning process needs only to comply with abbreviated CEQA requirements. The Staff Report and this checklist satisfy the requirements of State Water Board's Regulations for Implementation of CEQA, Exempt Regulatory Programs, which are found at California Code of Regulations, title 23, section 3775 et seq.

1. Project title:

Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances From Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity

2. Lead agency name and address:

California Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670

3. Contact person and phone number:

Betty Yee, Senior Water Resources Control Engineer
916-464-4643

4. Project location:

The Central Valley which comprises all basins including the Goose Lake Basin and the Tulare Lake Basin draining into the Sacramento and San Joaquin Rivers to the easterly boundary of the San Francisco Bay near Collinsville.

5. Description of project:

The project is the adoption of policies for variances from surface water quality standards for point source dischargers, variance program for salinity, and exception from implementation of water quality objectives for salinity. The *Variance Policy* will allow the Central Valley Water Board the authority to grant short-term exceptions from meeting water quality based effluent limitations to dischargers subject to National Pollutant Discharge Elimination System (NPDES) permits. The policy will only apply to non-priority pollutants.

The *Salinity Variance Program* will allow the Central Valley Water Board the authority to grant variances from meeting water quality based effluent limitations for salinity constituents to publicly owned treatment works (POTWs). The *Salinity Exception Program* will establish procedures for dischargers that are subject to waste discharge requirements (WDRs) and conditional waivers to obtain a short-term exception from meeting effluent or groundwater limitations for salinity constituents. The *Salinity Variance Program* and the *Salinity Exception Program* are necessary because NPDES permits, WDRs, and conditional waivers are being adopted with salinity limitations that dischargers cannot meet without the addition of expensive reverse osmosis treatment technology. At this time, there are planning processes by the Central Valley Salinity Alternative for Long-Term Sustainability (CV-SALTS) to develop a comprehensive salt and nutrient management plan for the Central Valley and by the State Water Board to review the salinity objectives in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. These planning processes may change the water quality objectives applicable to dischargers that are currently facing additional treatment requirements. So there is a need to set permit limitations at a level that protects water quality but does not compel the irretrievable commitment of major resources in advance of the completion of these planning processes.

Since the project allows dischargers an opportunity to delay implementation of treatment measures for a short period of time, there is no reasonably foreseeable need for the installation of pollution control equipment.

EVALUATION OF THE ENVIRONMENTAL IMPACTS IN THE CHECKLIST

1. The board must complete an environmental checklist prior to the adoption of plans or policies for the Basin/208 Planning program as certified by the Secretary for Natural Resources. The checklist becomes a part of the Substitute Environmental Documentation (SED).

2. For each environmental category in the checklist, the board must determine whether the project will cause any adverse impact. If there are potential impacts that are not included in the sample checklist, those impacts should be added to the checklist.

3. If the board determines that a particular adverse impact may occur as a result of the project, then the checklist boxes must indicate whether the impact is “Potentially Significant,” “Less than Significant with Mitigation Incorporated,” or “Less than Significant.”

a. “Potentially Significant Impact” applies if there is substantial evidence that an impact may be significant. If there are one or more “Potentially Significant Impact” entries on the checklist, the SED must include an examination of feasible alternatives and mitigation measures for each such impact, similar to the requirements for preparing an environmental impact report.

b. “Less than Significant with Mitigation Incorporated” applies if the board or another agency incorporates mitigation measures into the SED that will reduce an impact that is “Potentially Significant” to a “Less than Significant Impact.” If the board does not require the specific mitigation measures itself, then the board must be certain that the other agency will in fact incorporate those measures.

c. “Less than Significant” applies if the impact will not be significant, and mitigation is therefore not required.

d. If there will be no impact, check the box under “No Impact.”

4. The board must provide a brief explanation for each “Potentially Significant,” “Less than Significant with Mitigation Incorporated,” “Less than Significant,” or “No Impact” determination in the checklist. The explanation may be included in the written report described in section 3777(a)(1) or in the checklist itself. The explanation of each issue should identify: (a) the significance criteria or threshold, if any, used to evaluate each question; and (b) the specific mitigation measure(s) identified, if any, to reduce the impact to less than significant. The board may determine the significance of the impact by considering factual evidence, agency standards, or thresholds. If the “No Impact” box is checked, the board should briefly provide the basis for that answer. If there are types of impacts that are not listed in the checklist, those impacts should be added to the checklist.

5. The board must include mandatory findings of significance if required by CEQA Guidelines section 15065.

6. The board should provide references used to identify potential impacts, including a list of information sources and individuals contacted.

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| **I. AESTHETICS. Would the Project:** | | | | |
| a) Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially degrade the existing visual character or quality of the site and its surroundings? | ☐ | ☐ | ☐ | ☒ |
| d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. Except for water supply replacement, none of these measures will result in any visual changes to the environment. Evaluation of water supply replacement projects is speculative at this time since the proposed project does not require water supply replacement. Dischargers that implement water supply replacement projects will need to conduct a separate environmental review to identify project-specific significant environmental impacts and to incorporate any necessary measures to avoid, reduce, or mitigate for any identified significant environmental impacts. The proposed project will have no effect on aesthetics.

**II. AGRICULTURAL AND FORESTRY RESOURCES**. In determining whether impacts to agricultural resources are significant environmental impacts, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forestry resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. **Would the project:**

| | | | | |
|---|---|---|---|---|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with existing zoning for agricultural use or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned | ☐ | ☐ | ☐ | ☒ |

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| Timberland Production (as defined by Government Code section 51104(g))? | | | | |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. Dischargers will not need to encroach on any land currently used for agriculture or forestry to conduct any of these measures; therefore, the proposed project will have no effect on agricultural or forestry resources.

**III. AIR QUALITY.** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the Project:**

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☒ |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | ☐ | ☐ | ☐ | ☒ |
| c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? | ☐ | ☐ | ☐ | ☒ |
| d) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☐ | ☒ |
| e) Create objectionable odors affecting a substantial number of people? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. Except for water supply replacement, none of these measures will result in any air quality changes to the environment. Water supply replacement projects may result in construction of pipelines and other conveyance facilities and water treatment plants that may adversely affect air quality. Evaluation of water supply replacement projects is speculative at this time since the proposed project does not require water supply replacement. Dischargers that implement water supply replacement projects will need to conduct a separate environmental review to identify project-specific significant environmental impacts and to incorporate any necessary measures to avoid, reduce, or mitigate for any identified significant environmental impacts. The proposed project will have no effect on air quality.

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| **IV. BIOLOGICAL RESOURCES. Would the Project:** | | | | |
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☐ | ☒ |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☐ | ☐ | ☒ |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☐ | ☒ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. Other than water supply replacement, none of these measures will result in any change to biological resources. Water supply replacement may redirect stream flows that would leave less water for in-stream habitat. Evaluation of water supply replacement projects is speculative at this time since the proposed project does not require water supply replacement. Dischargers that implement water supply replacement projects will need to conduct a separate environmental review to identify project-specific significant environmental impacts and to incorporate any necessary measures to avoid, reduce, or mitigate for any identified significant environmental impacts. The proposed project will have no effect on biological resources.

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| **V. CULTURAL RESOURCES. Would the Project:** | | | | |
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | ☐ | ☐ | ☐ | ☒ |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature? | ☐ | ☐ | ☐ | ☒ |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. None of these measures will result in any change to cultural resources.

| | | | | |
|---|---|---|---|---|
| **VI. GEOLOGY AND SOILS. Would the Project:** | | | | |
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☐ | ☒ |
| ii) Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☒ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☒ |
| iv) Landslides? | ☐ | ☐ | ☐ | ☒ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☐ | ☒ |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☐ | ☐ | ☒ |

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. None of these measures will expose people or structures to earthquakes, seismic ground shaking, landslides nor will they cause soil erosion. Therefore, the proposed project will have no effect on geology or soils.

**VII. GREENHOUSE GAS EMISSIONS. Would the Project:**

| | | | | |
|---|---|---|---|---|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement.

However, if the proposed project does not go forward, some dischargers may need to implement end-of-pipe treatment or reverse osmosis of the effluent. Reverse osmosis is typically very expensive, energy intensive and results in a brine (10 to 20 percent of the waste stream) that must be properly disposed. The energy consumption of reverse osmosis and the brine waste stream are environmental impacts that must be considered when planning and designing reverse osmosis. (SWRCB. 2005., p 12.) LWA 2012 estimated the amount of carbon dioxide emissions that would result if the cities of Tracy, Stockton, Manteca and Fresno implemented reverse osmosis technology. Based on 2011 US Census Data (USCENSUS. 2011.), the per capita emissions are as shown in the following table:

| *City* | *Estimated Annual CO2 Emissions to Implement Reverse Osmosis Technology (LWA. 2012)* | *Population (2011 US Census data)* | *Estimated Annual CO2 Emissions per capita* |
|---|---|---|---|
| City of Tracy | 17,554 | 84,266 | 0.21 |
| City of Stockton | 55,318 | 296,357 | 0.19 |
| City of Manteca | 10,938 | 68,254 | 0.16 |
| City of Fresno | 51,040 | 598,291 | 0.09 |

California law (Health and Safety Code section 38500 et. Seq.) requires reduction in greenhouse gas emission to 1990 levels by 2020 and the California Air Resources Board determined that this means Californians must reduce the annual per capita emissions from 14 tons of carbon dioxide equivalent down to about 10 tons by 2020. (CARB. 2008., p. ES-1.) While the increased emissions from implementation of reverse osmosis are very small, they are increases and are, therefore, inconsistent with the need to reduce carbon dioxide emissions.

The proposed project is not expected to generate greenhouse gas emissions nor conflict with any plans to reduce emissions of greenhouse gases. In addition, the proposed project avoids increasing greenhouse gas emissions.

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| **VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the Project:** | | | | |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☐ | ☒ |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☐ | ☒ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☒ |
| e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area? | ☐ | ☐ | ☐ | ☒ |
| f) For a Project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area? | ☐ | ☐ | ☐ | ☒ |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the dischargers will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. None of these measures will result in any hazardous waste nor will any of these measures present a hazard to people.

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| **IX. HYDROLOGY AND WATER QUALITY. Would the Project:** | | | | |
| a) Violate any water quality standards or waste discharge requirements? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? | ☐ | ☐ | ☐ | ☒ |
| d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that results in flooding on- or off-site? | ☐ | ☐ | ☐ | ☒ |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? | ☐ | ☐ | ☐ | ☒ |
| f) Otherwise substantially degrade water quality? | ☐ | ☐ | ☒ | ☐ |
| g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | ☐ | ☐ | ☐ | ☒ |
| h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows? | ☐ | ☐ | ☐ | ☒ |
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | ☐ | ☐ | ☐ | ☒ |
| j) Inundation by seiche, tsunami, or mudflow? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The purpose of a variance or an exception is authorize a short-term change in water quality objectives for a specific discharger so that waste discharge requirements, conditional waivers, and NPDES permits may be adopted in compliance with water quality standards. The proposed project will have no effect on groundwater supplies, drainage, runoff or flood patterns.

The variance or the exception may result in continued water quality degradation during the term of the variance if the discharger was degrading water quality preceding the application for the variance or exception. Dischargers that cannot comply with current effluent limitations will be eligible to apply for a variance or an exception which will include conditions to maintain the current effluent quality so additional impacts and water quality degradation will not occur. The variance or exception will include interim performance-based limitations and will require development and implementation of a pollution prevention plan which may improve the quality of the effluent during the term of the variance or exception.

To provide information on potential water quality degradation, discharges from four municipal wastewater treatment facilities were analyzed. As shown in a technical memorandum from Larry Walker and Associates (2012., pp. 23-37, 46-47), for discharges to surface waters, modeling of receiving water quality, both near the point of discharge and downstream, that would result from the discharge indicates that the impacts to ambient water quality are imperceptible. A simple model on the impact to groundwater from a land discharger shows that the discharge will eventually be better quality than the background water quality so the impact to ambient groundwater is minimal. (LWA. 2012., pp. 37-46, 47)

Under the *Variance Policy* or the *Salinity Exception Program*, the Central Valley Water Board will have the authority to consider water conservation, drought and water recycling when determining the appropriate performance-based effluent limitations that will be in effect during the term of the variance or the exception. The State supports water conservation and has a conservation plan to reduce per capita urban water use. Most conservation measures reduce the amount of potable water that passes through a household but does not change the waste generated in the household. Therefore, increased conservation may result in increased concentrations of some pollutants; although, the loads would be expected to remain the same. During periods of drought, residents are called upon to increase water conservation. As just discussed, water conservation reduces the amount of water that passes through a household but does not reduce the amount of pollutants generated in the household. Water recycling can increase salinity if the recycled water is used in a manner that it re-enters the sewerage system. While increased salinity of the effluent does not always result from conservation, drought and recycling, there may be instances where a discharger can demonstrate that salinity increases is due to these activities. In such cases, the Central Valley Water Board should consider these increases and make reasonable accommodations in WDRs and conditional waiver provisions. At this time, any additional discussion on the potential impacts from allowing an interim effluent limitation that is higher than performance-based would be speculative. Variances under the *Variance Policy* and exceptions will be subject to environmental and anti-degradation analysis at the time they are considered.

Therefore, the proposed project is expected to have less than significant impact on water quality.

## X. LAND USE AND PLANNING. Would the Project:

| Issues | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to

| **ISSUES** | *POTENTIALLY SIGNIFICANT IMPACT* | *LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED* | *LESS THAN SIGNIFICANT IMPACT* | *NO IMPACT* |
|---|---|---|---|---|

add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will not divide a community, conflict with any land use plan nor will it conflict with a natural community conservation plan.

**XI. MINERAL RESOURCES. Would the Project:**

| | | | | |
|---|---|---|---|---|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☒ |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will have no effect on mineral resources.

**XII. NOISE. Would the Project result in:**

| | | | | |
|---|---|---|---|---|
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☐ | ☒ |
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☐ | ☒ |
| c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project? | ☐ | ☐ | ☐ | ☒ |
| d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project? | ☐ | ☐ | ☐ | ☒ |
| e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |
| f) For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. Except for water supply replacement, none of these measures will result in any change to noise levels in the environment. Water supply replacement projects may result in construction of pipelines and other conveyance facilities and water treatment plants that may increase noise levels. Evaluation of water supply replacement projects is speculative at this time since the proposed project does not require water supply replacement. Dischargers that implement water supply replacement projects will need to conduct a separate environmental review to identify project-specific significant environmental impacts and to incorporate any necessary measures to avoid, reduce, or mitigate for any identified significant environmental impacts. The proposed project will have no effect on noise levels.

**XIII. POPULATION AND HOUSING. Would the Project:**

| | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☒ |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will have no effect on population growth nor will it displace any people.

**XIV. PUBLIC SERVICES.**

| | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| Fire protection? | ☐ | ☐ | ☐ | ☒ |
| Police protection? | ☐ | ☐ | ☐ | ☒ |
| Schools? | ☐ | ☐ | ☐ | ☒ |
| Parks? | ☐ | ☐ | ☐ | ☒ |
| Other public facilities? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will have no effect on public services.

**XV. RECREATION.**

| | | | | |
|---|---|---|---|---|
| a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will neither increase use of recreational facilities nor does it include any new or expansion of existing facilities.

**XVI. TRANSPORTATION / TRAFFIC. Would the Project:**

| | | | | |
|---|---|---|---|---|
| a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways? | ☐ | ☐ | ☐ | ☒ |
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | ☐ | ☐ | ☐ | ☒ |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☒ |
| e) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance of safety of such facilities? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will have no effect on transportation systems nor will it change traffic pattern or conflict with any plans regarding public transit or bicycle or pedestrian facilities.

**XVII. UTILITIES AND SERVICE SYSTEMS. Would the Project:**

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | ☐ | ☐ | ☐ | ☒ |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☐ | ☐ | ☐ | ☒ |
| c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? | ☐ | ☐ | ☐ | ☒ |
| d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed? | ☐ | ☐ | ☐ | ☒ |
| e) Result in a determination by the wastewater treatment provider, which serves or may serve the Project, that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☒ |
| f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs? | ☐ | ☐ | ☐ | ☒ |
| g) Comply with federal, state, and local statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The purpose of a variance or an exception is authorize a short-term change in water quality objectives for a specific discharger so that NPDES permits, waste discharge requirements, and conditional waivers may be adopted in compliance with water quality standards. During the term of the variance, dischargers will not need to construct new or expand existing treatment facilities to reduce or eliminate the constituents for which a variance is granted. Therefore, the proposed project will have no effect on water supplies,

| ISSUES | POTENTIALLY SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|---|---|---|
| wastewater treatment capacity or solid waste. | | | | |
| **XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.** | | | | |
| a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☐ | ☐ | ☒ |
| b) Does the Project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | ☐ | ☐ | ☐ | ☒ |
| c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☐ | ☒ |

The proposed project would allow the Central Valley Water Board the authority to grant a variance or an exception from meeting certain effluent limitations. During the term of the variance or exception, the discharger will not need to add additional treatment technology but will be expected to develop and implement a pollution prevention plan which may include measures such as industrial pretreatment, residential water softener control, facility upgrades (i.e., operational changes), and water supply replacement. The proposed project will have no impact on the environment except for a potentially less than significant impact to water quality which is described in more detail in section IX of this checklist. Dischargers that are granted variances or exception will be required to meet an interim performance-based limitations and to develop and implement pollution prevention plans that may improve the quality of the effluent during the term of the variance or exception. These conditions will assure that any potential impacts are insignificant and will not be cumulatively considerable nor have effects that will cause substantial effects on human beings.

## Preliminary Staff Determination

On the basis of this evaluation and staff report, which collectively provide the required information:

☒ The proposed project COULD NOT have a significant effect on the environment, and, therefore, no alternatives or mitigation measures are proposed.

☐ The proposed project MAY have a significant or potentially significant effect on the environment, and therefore alternatives and mitigation measures have been evaluated.

| | |
|---|---|
| PAMELA C. CREEDON<br>Executive Officer<br>California Regional Water Quality Control Board<br>Central Valley Region | DATE |

Note: Authority cited: Section 21082, Public Resources Code. Reference: Sections 21080(c), 21080.1, 21080.3, 21080.5, 21082.1, 21083, 21083.05, 21083.3, 21093, 21094, 21151, Public Resources Code; *Sundstrom v. County of Mendocino*, 202 Cal.App.3d 296 (1988); and *Leonoff v. Monterey Board of Supervisors*, 222 Cal.App.3d 1337 (1990).

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California Air Resources Board (CARB). 2008. Climate Change Scoping Plan, a framework for change. December. p. ES-1. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

Larry Walker Associates (LWA). 2012. Memorandum regarding Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region. December 6. Table 16, p. 55; Table 22, p. 70; and Table 24, p. 72.

US Census Bureau (USCENSUS). 2011. QuickFacts website. Available at: http://quickfacts.census.gov. Accessed on 11 January 2013 for cities of Tracy, Stockton, Manteca, Fresno and Clovis.

# APPENDIX B

# REGULATORY OPTIONS

# Evaluation of Alternative Regulatory Options

An assessment of various alternative regulatory strategies is needed to chart a course of action. The preferred option must go into effect before the comprehensive salt and nitrate management plan for the Central Valley under development by the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is adopted and the goal is to complete this strategy by 2012, it must be region-wide, and it must address all the compliance issues with salinity constituents. The preferred option should also support development of CV-SALTS. The following pro/con analysis matrix provides a starting point for that assessment. All alternatives will require a basin plan amendment.

## Pro/Con Analysis

| Alternative | Pro | Con | Timeline & Example |
|---|---|---|---|
| Policy allowing offsets | • Salts reduction projects are available as offset projects<br>• Offset program may create incentives for early projects that reduce salt levels<br>• Early projects can provide knowledge and opportunities to inform CV-SALTS planning and implementation effort<br>• Precedent exists: Santa Ana Water Board Basin Plan incorporates offset concept in its salt management/ implementation plan<br>• Would apply region-wide | • Ability to be developed and approved likely extends beyond the desired two year time frame<br>• Ambiguity whether participation in CV-SALTS and other activities can qualify as an offset project<br>• Complexity of offset program features – amount of credit, certainty of credit, duration of credit, etc. can hinder program development<br>• Unlikely to be adopted in a short time frame since offsets are controversial and will require a great deal of evaluation<br>• Uncertain whether it will address all compliance issues | • Santa Ana Water Board Offset Policy |
| Variance | • Directly addresses | • Durability is concern, | • USEPA has |

| | | | |
|---|---|---|---|
| | the regulatory issues (need for final effluent limitations) by providing a variance to the implementation of the adopted objectives<br>• May be possible within the two year time frame<br>• Addresses both State and federal regulatory constraints<br>• If approved, solution would be unambiguous<br>• USEPA guidance exists<br>• Would apply region-wide<br>• Sufficient information is available to process amendments in two years. | since variances must be re-approved at set (e.g. 5 year) intervals – future outcomes unknown<br>• Requires studies and findings to address the same factors necessary for Use Attainability Analyses<br>• Experience with variances in California is limited/poor<br>• Has not been done at a regional board level | approved variances for the Great Lakes states<br>• SIP Case-by-Case Exception |
| TMDL in Old River | • Would address significance of POTW salt loadings in watershed context<br>• Could lead to wasteload allocation that would resolve compliance problem for Tracy<br>• Could establish framework for offsets<br>• Might be able to process a basin plan amendment for a TMDL for Old River in two years.<br>• May be able to assign wasteload allocations that address compliance issues. | • Wouldn't necessarily solve problem, depending on outcome of wasteload allocation<br>• Only addresses one water body and one discharger. Multiple TMDLs for other watersheds may be required to address various permit situations<br>• Since waste contributions are not the sole cause of the salinity impairment in the Delta, it is not certain if State Water Board will approve wasteload allocations that do not attain the | • TMDL for Salt and Boron at Vernalis |

| | | | |
|---|---|---|---|
| | | water quality standards. | |
| Site-specific water quality objectives | • Would address both state and federal issues<br>• Precedent for approval by State and USEPA<br>• Hoffman and Grattan studies provide framework for development of SSOs<br>• Water quality objectives could be established region-wide | • Complicated, overlaps ongoing Bay-Delta planning efforts as well as CV-SALTS<br>• Controversial, with many interested parties<br>• Insufficient information is available to establish water quality objectives, CV-SALTS is currently gathering and assessing salinity information for this purpose.<br>• Dischargers may still be unable to meet effluent limitations based on revised water quality objectives<br>• Multiple basin plan amendments may be needed and all amendments could not be completed in two years. | • SSOs for temperature, pH and turbidity in Deer Creek<br>• Region-wide water quality objectives for pH and turbidity |
| CV-SALTS | • Will address salinity management issue in holistic, pragmatic context<br>• Will be a long term plan<br>• Will likely be supported by diverse group of stakeholders<br>• Process is region-wide | • Cannot be developed within an acceptable time frame<br>• Outcome uncertain<br>• CV-SALTS is the long-term planning process for which interim solutions need to be developed in the meantime. | • Santa Ana Water Board Basin Plan |

In addition to the above alternatives suggested by the SWRCB, the following alternatives merit at least preliminary consideration:

| Alternative | Pro | Con | Example & Timeline |
|---|---|---|---|
| WQ Standards Implementation such as Mixing Zones, Point of Application | • Approvable under USEPA regulation 40 CFR 131.13.<br>• Applicable region-wide<br>• Most likely can be adopted and put into effect quickly | • Part of CV-SALTS so it would be duplicative to develop these strategies now.<br>• May not address all the compliance issues. | |
| Use De-Designation | • Approvable under 40 CFR 131.10<br>• Could demonstrate that attainment of use/objectives in Old River not feasible<br>• Can be completed in a short time frame if information supporting de-designation is readily available. | • May not be able to justify removing uses<br>• Solution to compliance issue uncertain<br>• May not be able to be completed in the desired time frame due to complicated technical analysis<br>• AGR and MUN are existing uses that may not be de-designated.<br>• AGR de-designation has never been done and might be very controversial.<br>• Addresses one water body at a time. | • Old Alamo Creek<br>• Sulphur Creek |

# APPENDIX C

# CONSERVATION, DROUGHT, AND WATER RECYCLING

## CONSERVATION

The State has a general policy to conserve water (Wat. Code §100). Consistent with that policy, in 2008, the Governor called upon the State agencies to develop a water conservation plan to achieve a 20 percent reduction in per capita water use statewide by 2020. The Legislature supported this goal with the Water Conservation Act of 2009.

Indoor water conservation generally reduces the amount of water that is used. However, the waste loads remain the same. With less water to dilute the waste loads, concentrations of waste constituents are expected to increase with increased conservation. A 1999 study mentions that long-term indoor water conservation measures increase salinity concentrations of residential wastewater by 2 to 5 percent. (Bookman-Edmonston. 1999., pp. 2-7.)

The state agencies completed the *20x2020 Water Conservation Plan* in February 2010. (California. 2010.) The focus of this effort was urban water use. The 20x2020 Water Conservation Plan contains regional targets based on the potential for conservation in each region from water use in 2005. For the Central Valley, the targets are approximately 33 percent reduction per capita. Urban water use is a mix of indoor and outdoor water use. In the Central Valley, about 30 percent of the targeted reductions are expected to come from indoor water use. Therefore, by 2020, the amount of indoor water use could be reduced by 10 percent and a commensurate increase in waste concentrations, specifically salinity, can be expected.

## DROUGHT

During periods of drought, residents are called upon to reduce water use. In some cases, due to the lack of water supply, residents have achieved extraordinary reductions in water use. Excepting the most extraordinary examples of reductions in water use, the waste loads generated by residents remain the same. The end result, similar to conservation efforts, is increased waste concentrations.

Historical multi-year droughts affecting Northern California, the source of much of the State's water supply, include: 1912-13, 1918-20, 1923-24, 1929-34, 1947-50, 1959-61, 1976-77, and 1987-92. (DWR. 2000. Page 9.) The latest drought occurred from 2008-11. Droughts in California cannot be predicted but based on the historical occurrences; it is possible for a drought to occur during any single permit term and likely to occur in two permit terms.

An additional concern with respect to wastewater effluent quality is the situation where a municipality uses surface water under appropriative water rights during wet years but must resort to poorer quality groundwater during dry years. Appropriative water rights are based on seniority. During periods of drought, there may be insufficient water to satisfy all the right holders and the most recent ("junior") right holder must be the first to discontinue use. (SWRCB. 2002.) In this case, the water quality improvements that occurred with the use of surface water will be lost and the water quality will revert to the quality resulting from the use of groundwater for the municipal supply.

**WATER RECYCLING**

Water recycling can increase salinity of the effluent if the recycled water re-enters the sewage system. Usually, recycled water is applied outdoors and does not re-enter the sewage system but might indirectly discharge to the receiving water if the recycled water is used in the watershed or drainage area of the receiving water. Recycled water more likely will reduce salinity of the receiving water because the recycled water, with its salt load, is not going to be discharged to the receiving water. For dischargers that recycle water, it may be demonstrated that increased salinity concentration in the effluent will not have an adverse effect on the receiving water because a salt load has been diverted for recycling. The increased salinity concentration could become the effluent limitation if the discharger demonstrates the same or better quality receiving water.

**REFERENCES**

Bookman-Edmonston Engineering, Inc. (Bookman-Edmonston).1999. Metropolitan Water District of Southern California and United State Department of the Interior Bureau of Reclamation Salinity Management Study. Final Report. Long-Term Strategy and Recommended Action Plan. June. pp 2-7. Available at: ftp://ftpdpla.water.ca.gov/users/prop50/10024_BayArea/Attach.%208%20Supporting%20Docs/Econ%20Analysis%20Supporting%20Documents/Salinity%20Management%20Study/FullReport.pdf

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# APPENDIX D

# WASTEWATER DISCHARGERS WITH NPDES PERMITS

Appendix D is an Excel spreadsheet with a compilation of salinity requirements for municipal and domestic point source dischargers with National Pollutant Discharge Elimination System (NPDES) permits. The information was compiled from Central Valley Water Board NPDES permits as of December 2011. The information was compiled to provide an overview of the scope of the project. Information on specific dischargers should be confirmed by reviewing the appropriate NPDES permit. Because of the size of the spreadsheet, a paper copy is not included in this report. Instead the compilation is available electronically in a Microsoft Excel file upon request.

# ATTACHMENT 3

# Memorandum

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DATE: December 6, 2012

TO: Betty Yee, CVRWQCB
Debbie Webster, CVCWA

COPY TO: Tom Grovhoug

SUBJECT: **Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region**

## I. INTRODUCTION

The management of salts in the surface water and groundwater of the Central Valley has been a central focus of the water quality control plans (Basin Plans) for the Sacramento-San Joaquin and Tulare basins since their adoption in 1975. The management of salts is also a primary issue in the Bay-Delta Plan that is adopted and implemented by the State Water Resources Control Board. Salts management is needed to protect municipal and agricultural beneficial uses and to avoid long-term increases in salt levels to detrimental levels in soils and waters of the Central Valley.

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) and State Water Resources Control Board (SWRCB or State Water Board), working with a stakeholder coalition, are developing a comprehensive salinity and nutrient management plan for the Central Valley. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a strategic initiative to address salinity and nitrates in the surface water and groundwater of the valley. The long-term plan developed under CV-SALTS will identify effective and efficient management and regulation of major sources of salts and nitrates. The SWRCB is also in the process of reviewing and possibly revising existing salinity standards for the Sacramento-San Joaquin Bay-Delta.

A serious issue exists regarding the adoption of final effluent limits for salts in three recent National Pollutant Discharge Elimination System (NPDES) permits in the Delta for the communities of Tracy, Stockton and Manteca. These effluent limits, which were derived without the benefit of knowing the ultimate CV-SALTS or Bay-Delta standards determinations and may not, in fact, be consistent with those future outcomes, are placing these communities in an untenable compliance position. In each instance, the effluent limits are unattainable through any means short of reverse osmosis treatment of a portion of the total effluent discharged from the community. Other communities with NPDES permits face similar situations and similar concerns. Concern also exists that problematic effluent limits for salts are being or will be required in other permits, in the form of Waste Discharge Requirements (WDRs) in the Central Valley (e.g. City of Fresno). The need exists to implement regulatory approaches that result in requirements which are consistent with the management plans being developed under CV-SALTS and in the State Water Board's Bay-Delta Plan and which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities.

The Central Valley Water Board has examined alternative mechanisms to address situations such as the one described above, where discharger compliance with water quality standards is currently infeasible, and where changes in those standards and/or the implementation of those standards are in development. An interim salinity program, which includes a water quality standards variance policy applicable to surface waters and a case-by-case exception for effluent limits in WDRs, would provide a necessary short-term regulatory tool while long-term holistic solutions and revised standards and effluent limits are under development.

For surface waters, United States Environmental Protection Agency (USEPA) guidance indicates that a water quality standards variance has been and can be used to provide a mechanism by which NPDES permits can be written where discharger compliance with the underlying water quality standards is demonstrated to be infeasible at the present time within the meaning of 40 CFR 131.10(g) (US EPA, 1998). The justification for a variance policy applicable to surface waters contained within this memorandum is based on consideration of the factors specified in 40 CFR 131.10(g).

This memorandum provides the technical evaluation of a variance policy and interim salinity program and is organized as follows:

## II. SUMMARY OF EFFLUENT QUALITY OF AFFECTED NPDES AND WDR PERMITTEES

The NPDES permittees that are examined in this evaluation and would be affected by a salinity variance (applicable to surface water dischargers) include the City of Tracy, the City of Stockton, and the City of Manteca. The WDR permittee evaluated herein for a case-by-case effluent limit exception is the City of Fresno. In this section, a summary of the respective effluent quality for each of these permittees is provided in the form of summary statistics for effluent electrical conductivity (EC) and total dissolved solids (TDS) concentrations.

### a. Effluent Quality: City of Tracy Wastewater Treatment Plant

Summary statistics for the City of Tracy's Wastewater Treatment Plant (WWTP) effluent EC and TDS concentrations are shown in **Table 1**.

**Table 1: Summary of City of Tracy WWTP Effluent EC and TDS (March 2009 to March 2011).**

| | Average Monthly EC (µmhos/cm) | | Average Monthly TDS (mg/L) | |
|---|---|---|---|---|
| **Statistic** | **Apr 1 – Aug 31 (limit 700)** | **Sep 1 – Mar 31 (limit 1000)** | **Apr 1 – Aug 31** | **Sep 1 – Mar 31** |
| Maximum | 1317 | 1290 | 780 | 746 |
| Minimum | 1092 | 1068 | 651 | 628 |
| Average | 1223 | 1169 | 716 | 673 |
| Standard deviation | 80 | 68 | 48 | 32 |

### b. Effluent Quality: City of Stockton Regional Wastewater Control Facility

Summary statistics for the City of Stockton's Regional Wastewater Control Facility (RWCF) effluent EC and TDS concentrations are shown in **Table 2** and **Table 3**.

**Table 2: Summary of City of Stockton RWCF Effluent EC (October 2006 to April 2011).**

| | Average Monthly EC (µmhos/cm) | | |
|---|---|---|---|
| **Statistic** | **Apr 1 – Aug 31 (limit 700)** | **Sep 1 – Mar 31 (limit 1000)** | **Annual Average EC (limit 1300[1] µmhos/cm)** |
| Maximum | 1214 | 1192 | 1228 |
| Minimum | 995 | 892 | 1054 |
| Average | 1111 | 1026 | 1167 |
| Standard deviation | 48 | 68 | 68 |

Note:

1. Order No. R5-2008-0154 includes a final, provisional, annual average performance-based effluent limitation of 1300 µmhos/cm for EC to protect the receiving water from further salinity degradation based on the highest annual average RWCF effluent concentration. This effluent limitation will remain in effect as long as the City of Stockton implements the provisional requirements to submit and implement a Salinity Plan. If the City fails to implement these provisional requirements, then the Order requires the Discharger to comply with the Bay-Delta Plan seasonal monthly average EC effluent limits of 700 µmhos/cm (April through August) and 1000 µmhos/cm (September through March).

**Table 3: Summary of City of Stockton RWCF Effluent TDS (October 2006 to April 2011).**

| Statistic | Average Monthly TDS (mg/L) Apr 1 – Aug 31 | Average Monthly TDS (mg/L) Sep 1 – Mar 31 | Annual Average TDS (mg/L) |
|---|---|---|---|
| Maximum | 723 | 704 | 660 |
| Minimum | 585 | 514 | 629 |
| Average | 656 | 608 | 639 |
| Standard deviation | 35 | 47 | 11 |

## c. Effluent Quality: City of Manteca Wastewater Quality Control Facility

Summary statistics for the City of Manteca's Wastewater Quality Control Facility (WQCF) effluent EC and TDS concentrations are shown in **Table 4**.

**Table 4: Summary of City of Manteca WQCF Effluent EC and TDS between 9/2007 – 3/2011.**

| | Average Monthly EC (µmhos/cm) | | Average Monthly TDS (mg/L) | |
|---|---|---|---|---|
| Statistic | Apr 1 – Aug 31 (limit 700) | Sep 1 – Mar 31 (limit 1000) | Apr 1 – Aug 31 | Sep 1 – Mar 31 |
| Maximum | 843 | 827 | 499 | 503 |
| Minimum | 696 | 667 | 335 | 375 |
| Average | 763 | 741 | 455 | 437 |
| Standard deviation | 40 | 40 | 39 | 36 |

## d. Effluent Quality: Cities of Fresno and Clovis (Fresno-Clovis) Metropolitan Regional Wastewater Reclamation Facility

Summary statistics for the Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility (RWRF) effluent EC and TDS concentrations are shown in **Table 5**.

**Table 5: Summary of Fresno-Clovis Metropolitan RWRF Effluent EC between 1/2005 – 3/2011 and TDS between 1/2006 – 3/2011.**

| Statistic | Average Monthly EC (µmhos/cm) | EC Source Water-Based Limit[1] (µmhos/cm) | Average Monthly TDS (mg/L) |
|---|---|---|---|
| Maximum | 969 | 799 | 495 |
| Minimum | 742 | 766 | 390 |
| Average | 827 | 781 | 446 |
| Standard deviation | 53 | 10 | 24 |

Note:

1. Calculated per Waste Discharge Requirements Order No. 5-01-254: "The monthly average EC of the discharge, shall not exceed the flow-weighted average EC of the source water plus 500 µmhos/cm, or a maximum of 900 µmhos/cm, whichever is less. The flow-weighted average for the source water shall be a moving average for the most recent twelve months." The source water-based limit was calculated for each month beginning in December 2005 (i.e., using January 2005-December 2005 data). See **Table 6.**

## III. DESCRIPTION OF COMPLIANCE ISSUE

This section contains a description of the current and future compliance issues facing each community evaluated, and the ability of each to meet effluent limits for electrical conductivity through means other than reverse osmosis, including potential or implemented source control, new surface water supplies, or other methods. The current permit requirements for these dischargers are presented in **Table 6**.

**Table 6: Summary of Current Permit Requirements for Salinity for Select Central Valley Dischargers.**

| Regulated Entity | NPDES Permit Order No. | Final Effluent Limitations for EC (µmhos/cm) | | | State Water Board Remand Order |
|---|---|---|---|---|---|
| | | Annual Average | Monthly Average | Maximum | |
| City of Tracy | R5-2007-0036 | N/A | 700 (Apr 1 – Aug 31)<br>1,000 (Sep 1 – Mar 31) | N/A | WQ 2009-0003 |
| City of Stockton | R5-2008-0154 | 1,300 | 700 (Apr 1 – Aug 31)<br>1,000 (Sep 1 – Mar 31) | N/A | WQ 2009-0012 |
| City of Manteca | R5-2009-0095 | N/A | 700 (Apr 1 – Aug 31)<br>1,000 (Sep 1 – Mar 31) | N/A | None |
| City of Fresno | 5-01-254 | N/A | N/A | Most stringent of source water flow-weighted 12-month moving average EC plus 500, or 900[a] | None |

Notes:
N/A = Not applicable
a. Summary statistics for the calculations of source water EC plus 500 for each month, based on the most recent 12 months, are included in **Table 5** for the time period indicated.

### a. Compliance Issue: City of Tracy Wastewater Treatment Plant

The City of Tracy WWTP is currently discharging pursuant to Order No. R5-2007-0036 and NPDES Permit No. CA0079154 (CRWQCB, Central Valley Region, 2007). Final effluent limitations for EC consistent with those in the Bay-Delta Plan are delineated in Section IV.A.1.i. of that Order; however, they are only effective if the City of Tracy does not submit a Salinity Plan or fails to implement such a Salinity Plan in a timely manner after it is approved. That is, if the City of Tracy submits and implements an approved Salinity Plan, no enforceable final effluent limitations for EC are specified.

Petitions were filed with the State Water Board requesting review of this Order. In response to some of the objections raised by one of several petitioners (California Sportfishing Protection Alliance (CALSPA)), the State Water Board issued a remand order (Order WQ 2009-0003, dated May 19, 2009) (CSWRCB, 2009a) that addressed, among other issues, the final effluent limitations for EC. This remand order requires the Central Valley Water Board to amend Order No. R5-2007-0036 "to include a final effluent limitation for EC in compliance with the objectives in the Bay-Delta Plan, and, if appropriate, initiate a water quality planning process" to achieve compliance without the need for reverse osmosis. The State Water Board suggested that the following be considered when evaluating "interim" planning options to resolve the salinity problem for the City of Tracy, although it does not comment on the appropriateness of any of these options:

- City of Tracy salt reduction study
- TMDL for EC in Old River
- Site-specific objectives in the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Sacramento-San Joaquin Basin Plan)
- Request to State Water Board for amendment to the Bay-Delta Plan
- Outcomes from CV-SALTS
- Near-term planning options:
  - Variances
  - Site-specific objectives
  - Policy allowing offsets

The State Water Board also suggested that if an interim planning option is pursued, both short- and long-term management strategies should be implemented. In Order WQ 2009-0003, the State Water Board acknowledged that "while salts present a difficult long-term management challenge, they are more amenable to interim planning solutions than bioaccumulative or toxic pollutants" (p. 10, footnote 17). In other words, the water quality impacts associated with salt concentrations tend to be chronic rather than acute and manifest in the long-term rather than the short-term. The implication is that approval of one of the interim approaches suggested above may be easier for salts than for other pollutants.

The City of Tracy contested SWRCB Order No. WQ 2009-0003 in Sacramento County Superior Court. On May 10, 2011, the court issued a Final Statement of Decision requiring the SWRCB to reconsider and revise Order No. WQ 2009-0003. Additionally, a Judgment Granting Peremptory Writ of Mandamus was issued on June 1, 2011 (*City of Tracy vs. State Water Resources Control Board*, 2011). The outcome of the SWRCB's reconsideration and revision is pending. The City of Tracy WWTP monthly average effluent EC and permit limits are presented in **Figure 1**. It can be seen that, although effluent EC levels have decreased during the timeframe shown, all of the monthly average values measured since January 2006 have exceeded the AMEL of 700 µmhos/cm between April 1 to August 31 and 1000 µmhos/cm between September 1 to March 31.

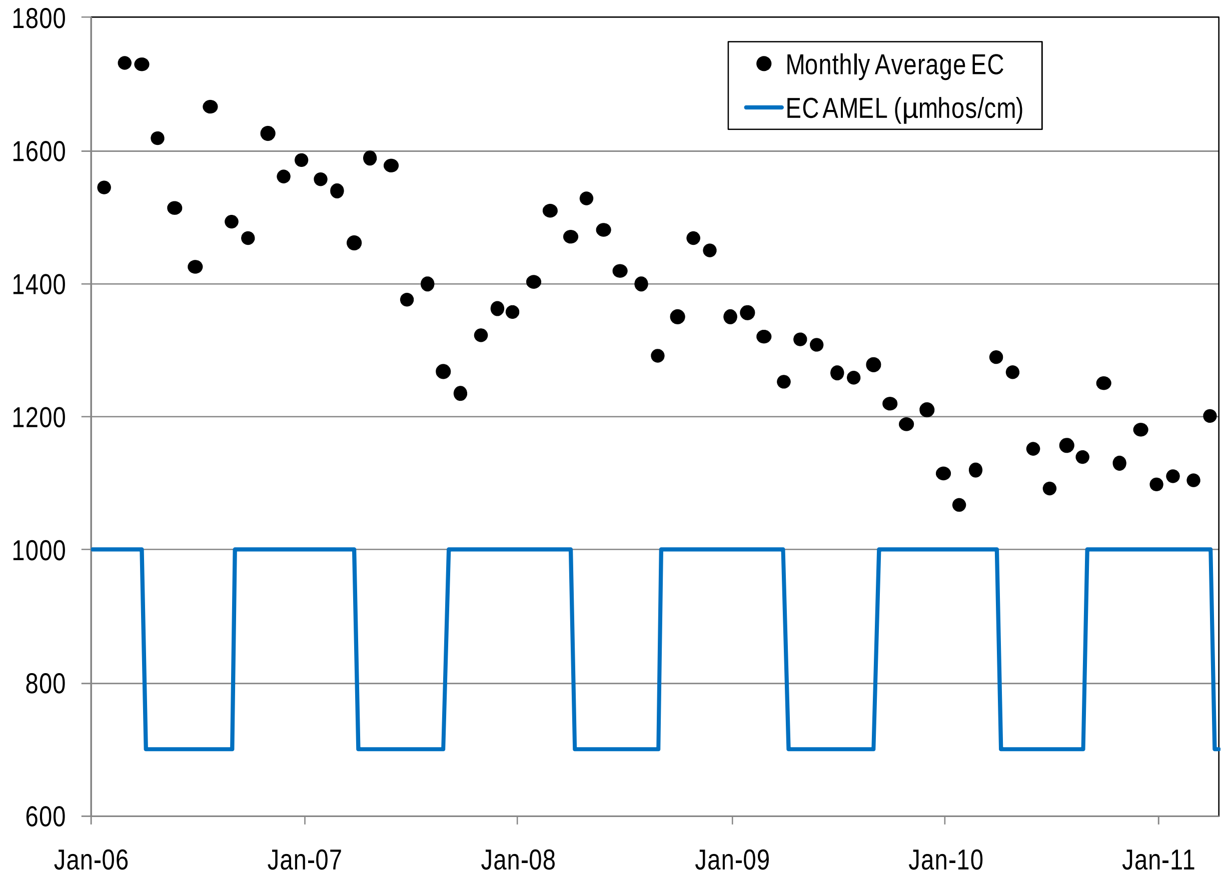


**Figure 1: City of Tracy WWTP: Electrical Conductivity Concentrations and Effluent Limits.**

### b. Compliance Issue: City of Stockton Regional Wastewater Control Facility

The City of Stockton RWCF is subject to waste discharge requirements as promulgated by the Central Valley Water Board in Order No. R5-2008-0154 (CRWQCB, Central Valley Region, 2008). Final effluent limitations for EC consistent with those in the Bay-Delta Plan are delineated in Section IV.A.1.j. of this Order; however, as with Order No. R5-2007-0036 (for the City of Tracy), these limits are only effective if the City of Stockton does not submit a Salinity Plan or fails to implement such a Salinity Plan in a timely manner after it is approved. That is, if the City of Stockton submits and implements an approved Salinity Plan, no enforceable final effluent limitations for EC are specified. The Order also contains a performance-based requirement – an annual average limit of 1,300 µmhos/cm. The City of Stockton is requesting a salinity variance to temporarily suspend the requirement for submittal and implementation of a Salinity Plan and to avoid the requirement to comply with the EC objectives contained in the Bay-Delta Plan.

Petitions were filed with the State Water Board in November 2008 requesting review of this Order. In response, the State Water Board issued a remand order (Order WQ 2009-0012, dated October 6, 2009) (CSWRCB, 2009b) that addressed, among other issues, the final effluent limitations for EC. In the discussion, the State Water Board references Order WQ 2009-0003 (City of Tracy) and reiterates that the manner in which the final effluent limitations were incorporated into both permits was "inappropriate and improper". In response to the City of Stockton's challenge of all provisions regarding EC and salinity reduction, the State Water Board states that reduction of salinity is both appropriate and necessary. The State Water Board also notes that the City of Stockton may be able to comply with the performance-based annual average limit of 1,300 µmhos/cm during the winter. The remand order requires the Central Valley Water Board to revise the final effluent limitation for EC in Order No. R5-2008-0154 "so that they are not contingent on submission of and compliance with a salinity plan". The City of Stockton RWCF monthly average effluent EC and permit limits are presented in **Figure 2**.

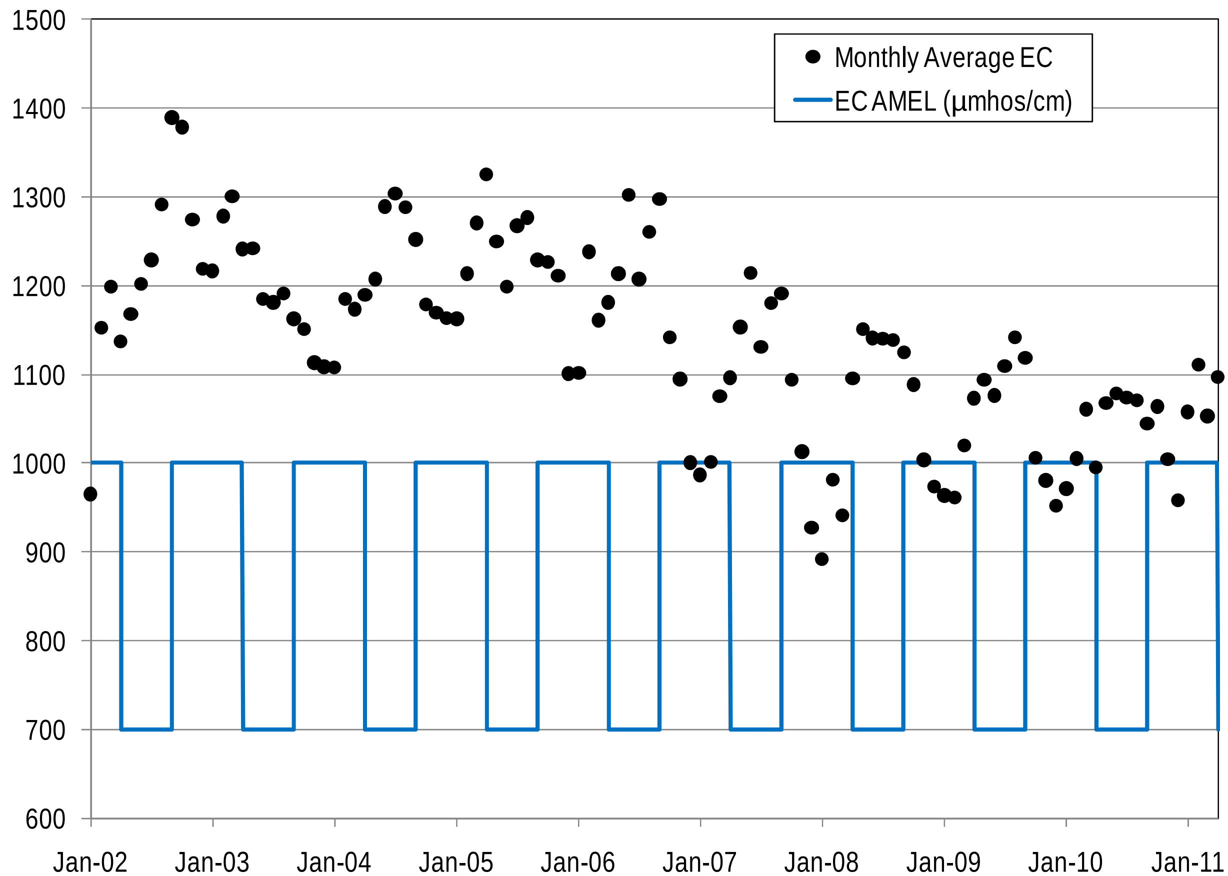


**Figure 2: City of Stockton RWCF: Electrical Conductivity Concentrations and Effluent Limits.**

## c. Compliance Issue: City of Manteca Wastewater Quality Control Facility

The City of Manteca WQCF is subject to waste discharge requirements as promulgated by the Central Valley Water Board in Order No. R5-2009-0095 (CRWQCB, Central Valley Region, 2009). This Order contains final effluent limitations for EC consistent with the salinity objectives in the Bay-Delta Plan for the southern Sacramento-San Joaquin Delta for the protection of agricultural irrigation uses (Order No. R5-2009-0095, Section IV.A.). The final effluent limits vary seasonally from 700 µmhos/cm (April 1 to August 31) to 1000 µmhos/cm (September 1 to March 31). Time Schedule Order No. R5-2009-0096, containing a non-seasonal interim effluent limitation of 1000 µmhos/cm and a time schedule for achieving compliance with the final effluent limitations, was also issued by the Central Valley Water Board.

The City of Manteca filed a Petition for Review with the State Water Board, challenging certain provisions of Order No. R5-2009-0095 and the Time Schedule Order, and concurrently requested a stay of the 700 µmhos/cm seasonal (April 1 to August 31) effluent limit, as well as the Time Schedule Order. The stay was requested to provide time for the State Water Board to act on the petition. The State Water Board denied the stay request on February 26, 2010. The City of Manteca appealed the denial, and the courts upheld the appeal. The State Water Board withdrew its denial of the stay request on December 14, 2010. However, the stay was accepted only for the final effluent limitation of 700 µmhos/cm, not the Time Schedule Order.

In 2005, the State Water Board issued the City of Manteca Order WQ 2005-0005 (SWRCB, 2005), which contained a discussion of the salinity situation. The State Water Board asserts:

> In the present case, the record indicates that the 700 µmhos/cm EC receiving water objective for April through August in the southern Delta frequently is not met, and that requiring the City to comply with an effluent limitation of 700 µmhos/cm EC would not significantly change the EC of water in the southern Delta area. In addition, the State Water Board's 1991 and 1995 Delta Plans, Revised Water Right Decision 1641, and State Water Board Resolution No. 2004-0062 all establish that the intended implementation program for meeting the 700 µmhos/cm EC objective was based primarily upon providing increased flows, possible construction of salinity barriers, and reducing the salt load entering the San Joaquin River from irrigation return flows and groundwater. (p. 13)

The City of Manteca WQCF monthly average effluent EC and permit limits are presented in **Figure 3**.

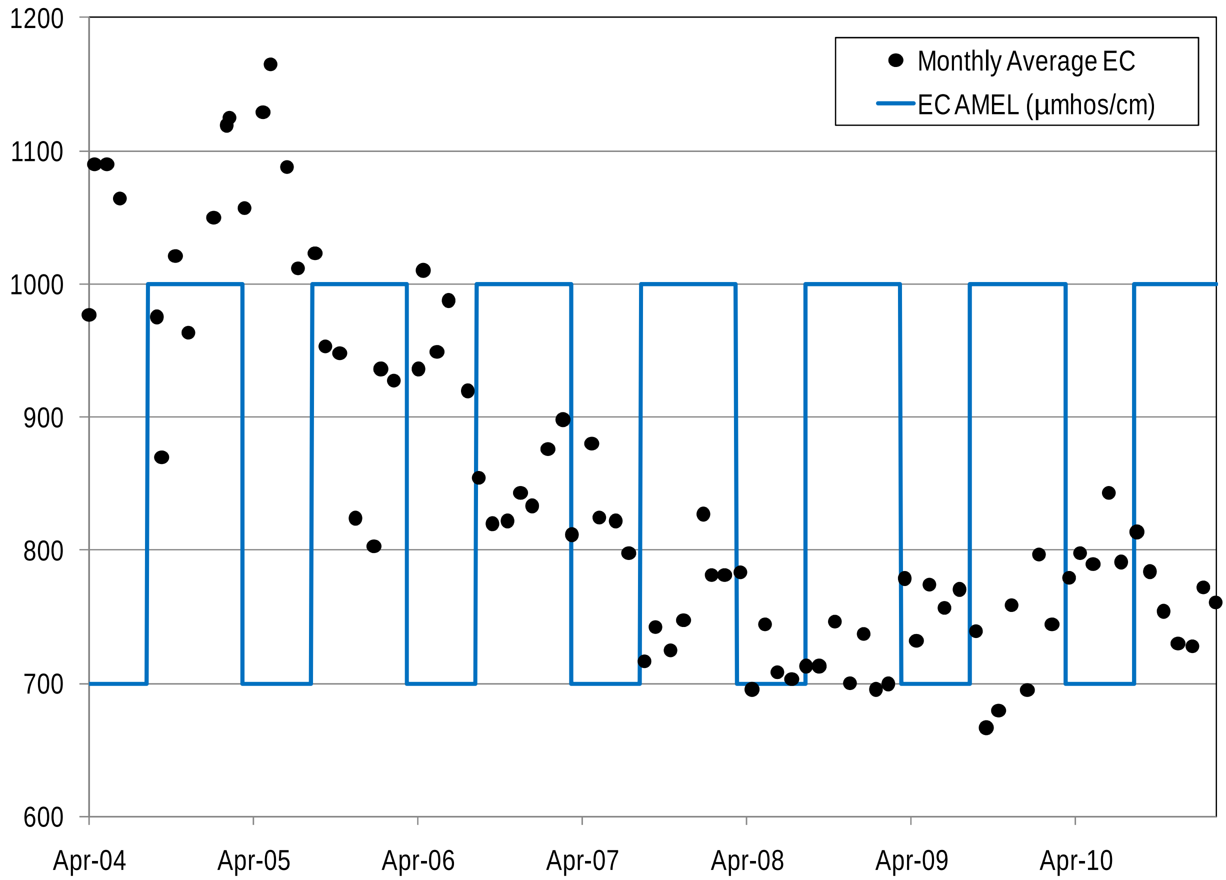


**Figure 3: City of Manteca WQCF: Electrical Conductivity Concentrations and Effluent Limits.**

### d. Compliance Issue: Cities of Fresno and Clovis (Fresno-Clovis) Metropolitan Regional Wastewater Reclamation Facility

The Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility (RWRF) is subject to waste discharge requirements as promulgated by the Central Valley Water Board in Order No. 5-01-254 (CRWQCB, Central Valley Region, 2002). This Order contains both final effluent limits and specifications for discharge to groundwater. Final effluent limitations for EC are as follows:

> The monthly average EC of the discharge, shall not exceed the flow-weighted average EC of the source water plus 500 µmhos/cm, or a maximum of 900 µmhos/cm, whichever is less. The flow-weighted average for the source water shall be a moving average for the most recent twelve months. (Section B.4.)

The specifications regarding discharges from the RWRF to groundwater are as follows:

> G. Groundwater Limitations. Release of waste constituents from any storage, treatment, or disposal component associated with the RWRF shall not, in combination with other sources of the waste constituents, cause groundwater

under and beyond the RWRF and discharge area(s) to exceed any of the following: [ . . . ]

2. Constituent concentrations listed below or natural background concentration, whichever is greater: [EC limitation is specified in table as 990 µmhos/cm.] (Section G.2.)

The Fresno-Clovis Metropolitan RWRF monthly average effluent EC and narrative permit limits are shown in **Figure 4**.

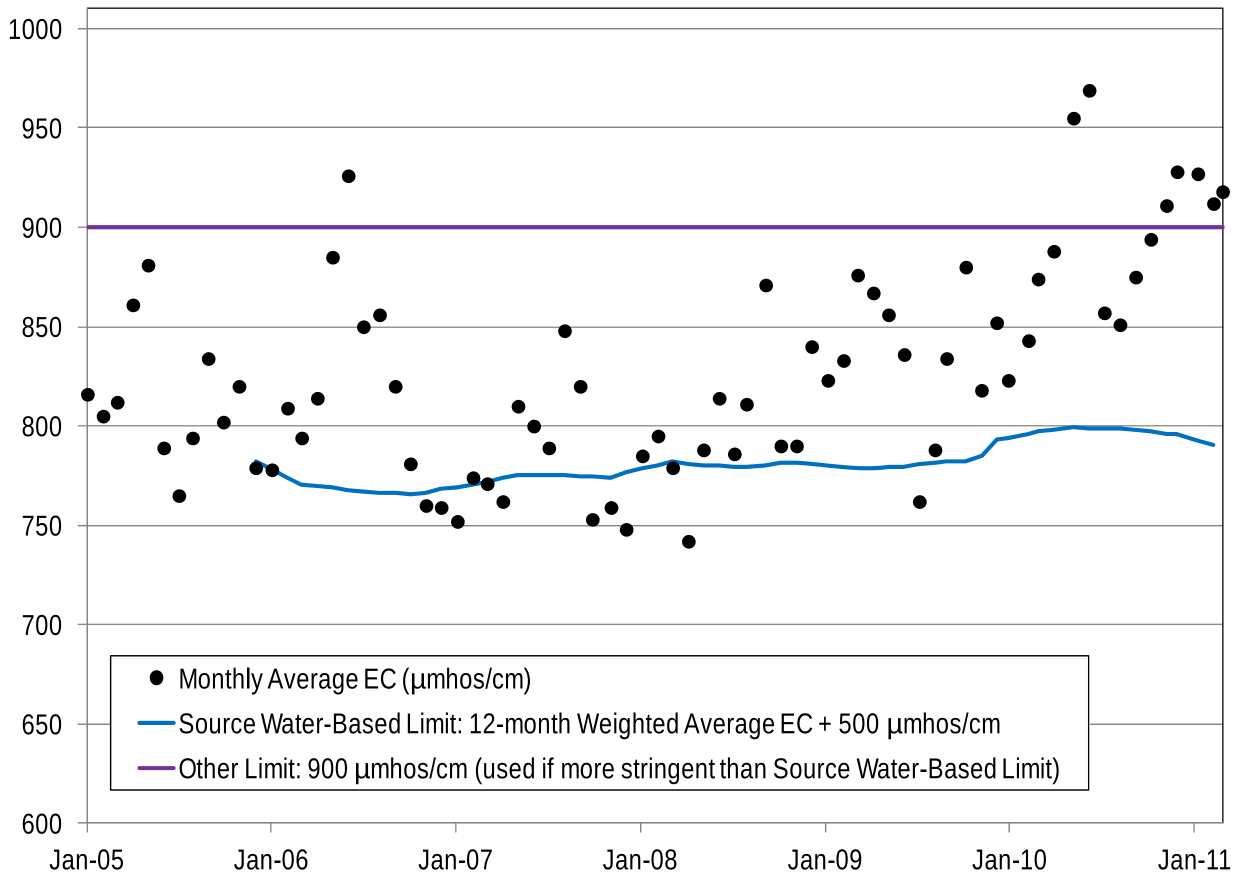


**Figure 4: Fresno-Clovis Metropolitan RWRF: Electrical Conductivity Concentrations and Effluent Limits.**

## IV. SUMMARY OF SOURCE CONTROL PROGRAMS

This section contains a summary of the source control programs that have been implemented and the effectiveness of those programs.

### a. Source Control: City of Tracy Wastewater Treatment Plant

Source control information for the City of Tracy was taken from the memorandum *Infeasibility Analysis and Compliance Schedule Justification in Support of a Time Schedule Order for the City of Tracy Wastewater Treatment Plant and NPDES Permit Modifications*, dated September 20, 2010 (City of Tracy, 2010), and from Steve Bayley, City of Tracy Deputy Director for Public Works (Bayley, 2011).

Concentrations of EC in the WWTP effluent have steadily decreased in recent years due to source control efforts, as shown in **Figure 5**. By implementing changes to water supply and industrial source control practices, the City of Tracy has achieved a 25% reduction in WWTP effluent EC, from average monthly levels of 1580 µmhos/cm prior to 2007, to 1191 µmhos/cm in more recent years (March 2009 – April 2011).

#### *i. Water Supply Source Control*

In the 1980s, the City of Tracy recognized that the continued use of increasingly mineralized native groundwater was degrading the quality of potable water delivered to its customers. The City Council adopted a policy in 1993, as part of the City's General Plan, stating that use of the native groundwater was to be reduced and the groundwater reserved for emergency purposes. At the same time, City staff evaluated the possibility of utilizing Sierra snowmelt water as a potable water source. In 1995, the City Council approved participation in the water supply project, in conjunction with the South San Joaquin Irrigation District and three other participating cities. This project included the construction of a drinking water treatment plant and approximately 40 miles of pipeline. The project cost was approximately $150 million. The City of Tracy's portion of this cost was $50 million. The City of Tracy funded the project through increased water rates and assessment districts.

In 2005, construction of the project was completed and water deliveries commenced. The City of Tracy began heavily utilizing the new water supply because of its high quality. In 2010, native groundwater usage was reduced to 600 acre-feet, or 3% of the potable water supply. Ultimately, substituting the low salinity Stanislaus River snowmelt water (average TDS of 60 mg/L) for the native groundwater (average TDS from 700 to 800 mg/L) has resulted in a significant reduction in the salinity of the City of Tracy's wastewater effluent.

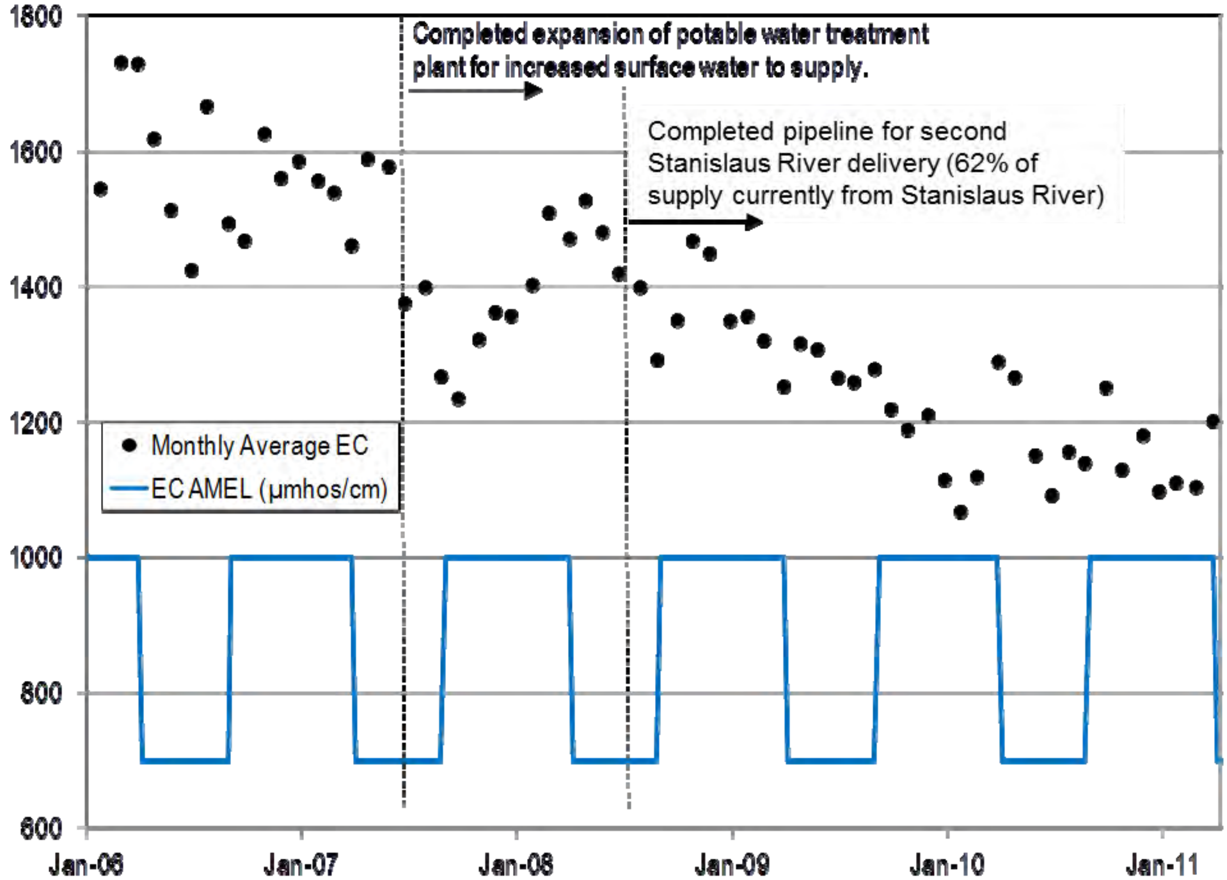


**Figure 5: City of Tracy WWTP EC Control Program Implementation Results.**

The chronology of the City of Tracy's water supply source control actions is as follows:

- **1995:** The City initiated a project to bring South San Joaquin Irrigation District's Stanislaus River water through 40 miles of pipeline to Tracy.
- **2001:** The City entered into long-term agreements to purchase additional surface water from the Delta-Mendota Canal (DMC) to replace groundwater.
- **2002:** The City began designing an expansion to the potable water treatment plant to process the additional DMC surface water.
- **2004:** Surface water from the DMC became available.
- **2005:** Delivery of surface water from the South San Joaquin Irrigation District's Stanislaus River supply commenced in September. A pilot project to store surplus surface water supplies in the Semitropic Water Storage District in Kern County was successful. The City prepared the environmental documentation to allow permanent storage.
- **2007:** The City completed an expansion to the potable water treatment plant to process the additional DMC surface water.

- **2008:** The City completed construction of a transmission pipeline allowing Stanislaus River water deliveries to a second location within Tracy. Sixty-two percent (62%) of the City's water supply is now from Stanislaus River water.
- **2010:** The City completed construction of an Aquifer Storage and Recovery (ASR) well and received approval from the RWQCB in December 2010 to perform pilot tests on injection of drinking water into the groundwater basin.
- **2011:** The City completed Year-1 of the pilot project where it injected into and then extracted from the groundwater basin 250 acre-ft of drinking water. The pumping of native groundwater was limited to 1.7% of the City's total potable water supply (Bayley, 2012).
- **2012:** The City completed Year-2 of the pilot program where it injected 700 acre-ft of drinking water into the groundwater basin, and is currently extracting the last of the injected water. The City prepared, circulated, and adopted a Negative Declaration under the California Environmental Quality Act (CEQA) for a permanent ASR Program.

  In 2012, the City received approval for long-term water storage in the Semitropic Water Storage District. The City is allowed to store up to 10,500 acre-ft and currently has 6,100 acre-ft in storage. The City also approved a second Negative Declaration under CEQA in 2012 for the Tracy Desalination and Green Energy Project. This project is proceeding towards permitting and construction. When operational, the project should reduce total dissolved solids (salinity) in the City's treated wastewater by approximately 80 mg/L from its current concentration.

In 2005, the City of Tracy acquired surface water sources to replace groundwater in their potable water supply system. These sources include the South San Joaquin Irrigation District's Stanislaus River water and water from the Delta-Mendota Canal (DMC) (City of Tracy, 2010). The quality of the DMC water is monitored by the Department of Water Resources Municipal Water Quality Investigations (DWR-MWQI) program at several locations. The average concentrations of EC and TDS are 416 µmhos/cm and 230 mg/L, respectively, as measured between 1994 and 1999 at the DMC water intake at Lindeman Road. More recent EC data collected by the Central Valley Water Board at the DMC off Highway 4 (upstream of Lindemann Road) from March 2009 through February 2010 shows a similar average EC concentration of 423 µmhos/cm (CRWQCB, Central Valley Region, 2010). The quality of the Stanislaus River water is monitored by the United States Geological Survey (USGS) at several locations. The average concentration of EC is 119 µmhos/cm, as measured between 1992 and 2008 in the Stanislaus River at Caswell State Park near Ripon.

The addition of surface water sources has reduced the City of Tracy's groundwater usage from 7,176 acre-feet in 2004 to 314 acre-feet in 2011, resulting in a reduction of approximately 6,800 tons of salt per year (Bayley, 2012). This change has also decreased the need for residential salt-based self-regenerating water softeners that contribute additional salinity to the WWTP. As a result of these efforts, the City has observed a decrease in the salinity of the WWTP effluent and found that as older self-regenerating water softeners fail they are not being replaced by the City's residents due to the high quality of the City's potable water supply (Bayley, 2012).

### *ii. Industrial Source Control/Pretreatment Program*

Leprino Foods Company (Leprino) is the only industrial facility in the City of Tracy WWTP service area. Leprino produces cheese and whey products. The City of Tracy and Leprino have worked together for more than 30 years on mutually beneficial solutions to wastewater treatment challenges, including reducing salinity loadings. Between 2006 and 2008, Leprino's TDS daily loading to the WWTP was reduced by approximately 20% through source loading reductions. Leprino has achieved source reductions by implementing numerous best management practices in its plant operations, all of which are designed to make efficient use of incoming raw materials, ingredients, and cleaning chemicals, thus minimizing discharges to the wastewater collection system. In 2008, Leprino contributed approximately 10% of the total TDS influent loading to the WWTP. As the quality of the City of Tracy's water supply improves, further reductions in the TDS/EC contributions from the Leprino plant effluent are expected (City of Tracy, 2010).

## b. Source Control: City of Stockton Regional Wastewater Control Facility

Source control information for the City of Stockton was taken from the *City of Stockton Regional Wastewater Control Facility Salinity Plan*, in the section "Source Control Estimates and Methods of Load Reduction" (RBI, 2009).

### *i. Water Supply Source Control*

The City of Stockton's current water supply has three sources: groundwater from wells owned by the City of Stockton, groundwater delivered by California Water Service Company, and surface water delivered by the Stockton East Water District. The surface water supply originates from the Stanislaus and Calaveras Rivers. The groundwater supply has naturally higher salinity levels than the surface water. In 2009, the groundwater sources had an average TDS concentration of 303 mg/L (City of Stockton wells) and 292 mg/L (California Water Service wells), compared to 82 mg/L in the surface water. Similarly, average EC levels in groundwater were 448 µmhos/cm (City of Stockton wells) and 425 µmhos/cm (California Water Service wells), compared to 132 µmhos/cm in the surface water (RBI, 2009).

In 2008, approximately 63 million gallons per day (MGD) of water were delivered from the three sources: 9 MGD from City of Stockton wells (14%), 8 MGD from California Water Service wells (13%), and 46 MGD from Stockton East Water District surface water (73%). The total load contributed by the water supply varies seasonally, according to the proportion of each water supply source used. A summary of the characteristics of the City of Stockton's water supply is provided in **Table 7**.

The City of Stockton recently completed construction of the Delta Water Supply Project (DWSP) as a new, supplemental water supply. The DWSP will augment local groundwater and existing surface water supplies to meet the City's water demands. The DWSP's surface water component includes a new water intake facility on the San Joaquin River. The DWSP's groundwater component includes injecting treated Delta surface water into the groundwater aquifer for later extraction during periods of restricted surface water supply.

**Table 7: Characteristics of the City of Stockton Water Supply (RBI, 2009).**

| Supply Source | Average EC (µmhos/cm) | Average TDS (mg/L) | Average Flow (2008, MGD) | Average TDS Load (lbs/day) |
|---|---|---|---|---|
| City of Stockton Wells | 448 | 303 | 9 | 23,471 |
| California Water Service Wells | 425 | 292 | 8 | 19,804 |
| Stockton East Water District (surface water) | 132 | 82 | 46 | 31,462 |
| Weighted average | 216 | 141 | N/A | N/A |
| **Total** | N/A | N/A | **63** | **74,737** |

Note:
N/A = Not applicable

Phase 1 of the DWSP (2012-2015) is designed to meet the water supply needs of full development anticipated to occur by the year 2015 under the City of Stockton's current 1990 General Plan. Phase 1 of the DWSP became operational in June 2012 and will provide approximately 27% of Stockton's water supply. The second and third phases of the DWSP (2015-2030 and 2031-2050) will involve expansions of the Water Treatment Plant, increased DWSP pumping and water use to meet increased City of Stockton Metropolitan Area (COSMA) demands, and groundwater injection and recovery.

The chronology of the COSMA water supply source control actions is as follows:

- **2008-2012:** 73% of COSMA's water supply is from surface water sources and the remaining 27% is from groundwater sources (RBI, 2009).
- **2012-2015:** Phase I of the DWSP. During Phase I, the aim will be to source as much water supply from surface waters as possible, with up to 27% of the total supply sourced from the SWSP diverted surface waters and 73% of the total supply from other surface water sources. Groundwater use will be minimized during Phase I, so as to allow the aquifers to recharge (RBI, 2009).
- **2015-2030:** Phase II of the DWSP. During Phase 2, the amount of groundwater contributing to the overall supply will gradually increase (RBI, 2009).
- **2031-2050:** Phase III of the DWSP. By 2050, it is estimated that approximately 21% (during wet years) to 35% (during dry years) of the total water supply will be sourced from groundwater (RBI, 2009).

Average salinity levels in DWSP raw water are expected to be lower than the average levels in existing COSMA groundwater supplies. San Joaquin River/Stockton Deep Water Ship Channel data collected by the City of Stockton shows that the average wet water year (WY) type TDS concentration was 173 mg/L (WY 2005-2006) and the average dry water year type TDS concentration was 196 mg/L (WY 2004). During WYs 2007 and 2008, both critical dry years, the average TDS concentration was 203 mg/L. These concentrations are lower than the average 2008 TDS concentrations in the City of Stockton's groundwater wells and the California Water

Service groundwater wells of 303 mg/L and 292 mg/L, respectively. Therefore, operation of the DWSP is expected to reduce water supply salinity contributions to the RWCF (RBI, 2009).

#### *ii. Industrial Source Control/Pretreatment Program*

The City of Stockton provides discharge permits to Significant Industrial Users (SIUs) through its industrial pretreatment program to regulate and control the discharge of salinity to the RWCF. Discharge permits for new SIUs contain an interim TDS concentration limit of 1000 mg/L as a daily maximum and an interim loading limit in pounds per month. The loading limit is based on an average TDS concentration limit of 800 mg/L and the permitted flow for that SIU (RBI, 2009).

#### *iii. Facility Processes*

The City of Stockton has replaced alum with polyaluminum chloride at the RWCF as a means to reduce the need for caustic during the treatment process. Some caustic is still used on occasion to optimize performance of nitrifying biotowers. These adjustments have led to an overall slight reduction in effluent EC levels, as described by the City of Stockton RWCF Chief Plant Operator (Garcia, 2012).

### c. Source Control: City of Manteca Wastewater Quality Control Facility

Source control information for the City of Manteca was taken from the *Electrical Conductivity Pollution Prevention Plan for the City of Manteca Wastewater Quality Control Facility*, in the section "Source Control Feasibility, Strategies, and Reductions" (LWA, 2010), and from a telephone conversation with Phil Govea, City of Manteca Public Works Deputy Director – Engineering (Govea, 2011).

Concentrations of EC in the WQCF effluent have decreased in recent years due to source control efforts, as shown in **Figure 6**. By implementing changes to water supply and industrial source control practices, the City of Manteca has achieved an approximate 32% reduction in WQCF monthly average effluent EC. The mean of the monthly average effluent EC values prior to 2005 was approximately 1100 µmhos/cm, and this has been reduced to 749 µmhos/cm for the period September 2007 – March 2011 (City of Manteca, 2009b). The average influent EC concentration in 2009 (used as the current influent concentration in Manteca's Pollution Prevention Plan (PPP) (LWA, 2010) was 733 µmhos/cm.

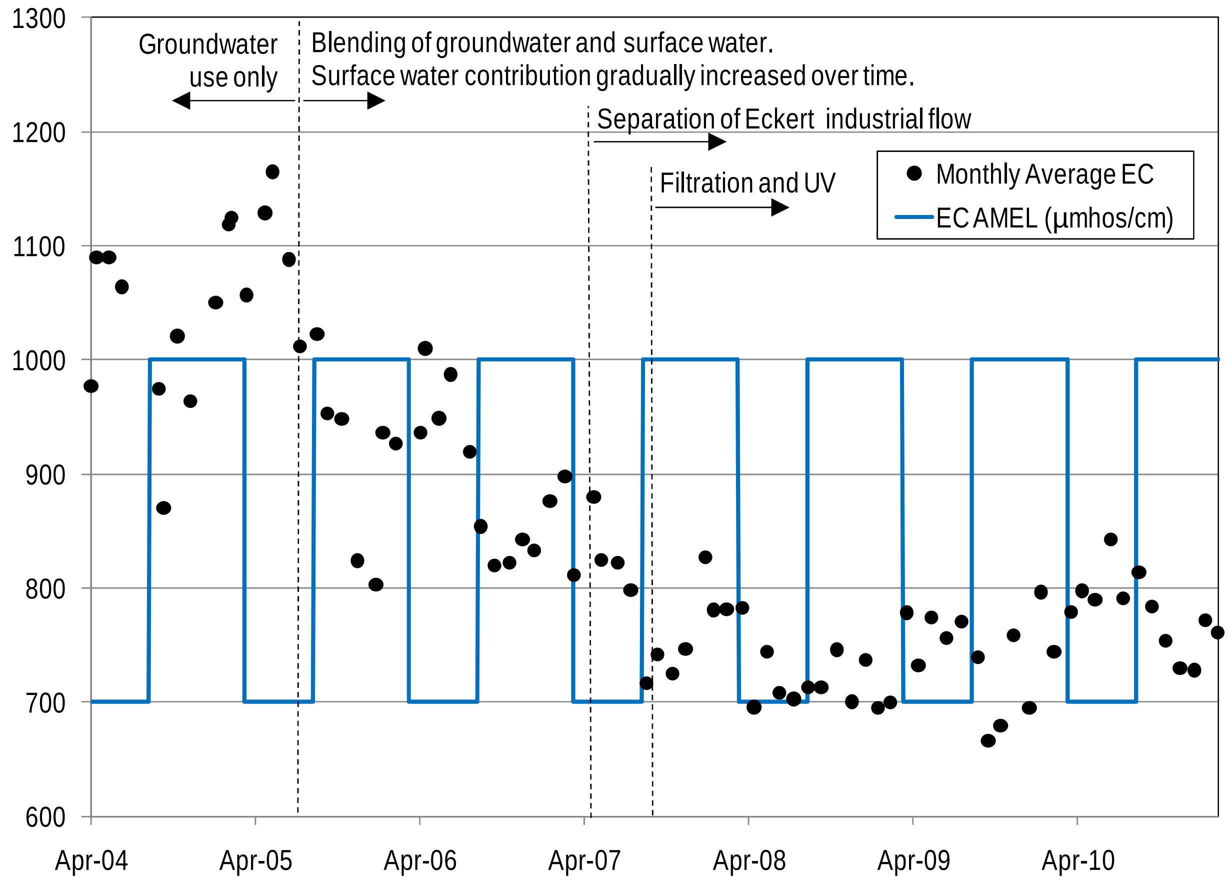


**Figure 6: City of Manteca WQCF EC Control Program Implementation Results.**

### *i. Water Supply Source Control*

The decrease in WQCF effluent EC levels is largely due to the City of Manteca's commitment to improve the WQCF effluent quality through a series of operational changes and a significant investment in a new water supply. The City of Manteca participated in the water supply project with the City of Tracy, in conjunction with the South San Joaquin Irrigation District and two other participating cities. The project cost was approximately $150 million. The City of Manteca was responsible for about 40% of this cost (approximately $60 million). The City of Manteca funded the project through the sale of bonds. In 2005, construction of the project was completed, and water deliveries commenced.

Over the past seven years, the City of Manteca has reduced the overall percentage of groundwater used as source water by replacing a portion of the water supply with surface water (LWA, 2012). The groundwater has naturally higher levels of salinity (283 – 378 mg/L TDS and 397-561 µmhos/cm EC) than surface water supplies (71-186 mg/L TDS and 117 – 172 µmhos/cm EC) (City of Manteca, 2012). The chronology of the City of Manteca's water supply source control actions is as follows:

- **2004:** Prior to 2005, 100% of the City of Manteca's source water was supplied by groundwater (LWA, 2012).

- **July 2005:** The City of Manteca began substituting a portion of its groundwater supply with surface water from the South San Joaquin Irrigation District water plant. In 2005, 25% of the City's water supply was sourced from surface water; 75% of total supply was sourced from groundwater (LWA, 2012).
- **2005-2009:** The proportional contribution of surface water to the City of Manteca's water supply steadily increased to 50% (LWA, 2012).
- **2009:** 50% of total water supply came from surface water (LWA, 2012). This proportion is expected to remain constant (City of Manteca, 2009b).

Due to constraints in its existing distribution system and in the operation of groundwater wells, the City cannot yet use its entire allotment of SSJID surface water. In the future, as the City grows and the water distribution system expands with it, the City will use more of its allotted surface water, but the current ratio of approximately 50% surface water and 50% groundwater is expected to remain unchanged in the near-term (LWA, 2010).

### *ii. Industrial Source Control/Pretreatment Program*

The City of Manteca constructed the Industrial Pipeline System to eliminate EC (salinity) discharged to the WQCF by the City of Manteca's largest industrial discharger, Eckert Cold Storage (Eckert). The Industrial Pipeline System has been fully operational since April 2007. It diverts Eckert's food-processing wastes to direct application on agricultural fields (City of Manteca, 2009b). Other food-processing industries are most likely the largest industrial sources of EC (salinity). If current industrial loads were reduced by 90% through the pretreatment program and no other source control measures were enacted, the projected average influent EC levels would be reduced to 725 μmhos/cm. Based on the small contribution to total influent loading from current industrial sources, even a 90% reduction is insufficient to achieve the seasonal AMEL of 700 μmhos/cm (LWA, 2010).

### *iii. Pollution Prevention Program*

The City of Manteca developed a PPP that contains an effectiveness evaluation for pollution prevention strategies aimed at limiting and/or reducing EC levels in the WQCF influent (LWA, 2010). These strategies are specifically aimed at residential brine-discharging water softeners. Banning new brine-discharging water softeners could potentially result in an influent EC decrease of 3 μmhos/cm, from 733 to 730 μmhos/cm. That ban in combination with an upgrade of existing brine-discharging water softeners to higher efficiency models could result in an influent EC decrease to 720 μmhos/cm. The ban and encouragement to remove existing brine-discharging water softeners could result in an influent EC decrease to 716 μmhos/cm. None of these source control activities would result in EC levels below the 700 μmhos/cm seasonal AMEL. A survey of water softener use would be conducted before any of these actions are implemented by the City.

It was shown in the PPP that if the industrial pretreatment program reduced industrial sources by 90%, the pollution prevention program banned new brine-discharging water softeners and 50% of existing brine-discharging water softeners were removed, and commercial dischargers responsible for above-average contributions of EC were required to implement BMPs (after a commercial source identification study), the resulting average influent EC concentration would still be greater than the 700 μmhos/cm seasonal AMEL, at 708 μmhos/cm (LWA, 2010).

### *iv. Facility Upgrades*

The City of Manteca replaced the WQCF's existing chlorine contact tank with tertiary filtration and UV disinfection, which appeared to contribute to a slight reduction in effluent EC levels; however, this reduction was not considered significant, nor was it distinguishable from the normal variability observed in the concentrations of this parameter in the City's effluent (City of Manteca, 2009b).

## d. Source Control: Fresno-Clovis Metropolitan Regional Wastewater Reclamation Facility

Source control information for the City of Fresno was taken from the *Fresno/Clovis Regional Wastewater Reclamation Facilities' Best Practicable Treatment and Control Comprehensive Evaluation* report, in the section "Source Control for Reduction of RWRF Influent Salinity" (Carollo, 2009).

### *i. Water Supply Source Control*

The City of Fresno plans to bring a new 70 MGD surface water treatment plant (SWTP) online by 2014 and also double the capacity of the existing SWTP. This would increase the City of Fresno's surface water supply from 30 MGD (current capacity) to 140 MGD by 2025. Available surface water has lower salt concentrations than local groundwater, and the increased use of surface water will lower the total amount of salt that enters the RWRF (Carollo, 2009) because average TDS concentration in the surface water supply is generally less than 15 mg/L compared with 218 mg/L in groundwater (Lau-Staggs, 2012).

The chronology of the City of Fresno's water supply source control actions is as follows:

- **2008:** Surface water provided 12% of Fresno's potable water demand. Average concentrations of salinity measured in municipal supply water were 309 µmhos/cm as EC and 219 mg/L as TDS (City of Fresno Water Division, 2009).
- **Current:** The TDS concentration of the surface water supply is 15 mg/L compared with 218 mg/L in groundwater (Lau-Staggs, 2012). The City of Fresno's water supply system receives treated surface water from water delivered directly from the Sierra to the Surface Water Treatment Facility (SWTF). Precipitation and snow melt from the Sierra Nevada Mountains run into the Kings and San Joaquin rivers. These water sources are available through the City of Fresno's federal Central Valley Project contract and Fresno Irrigation District entitlements. Water from either of these surface water supply sources is currently delivered to the SWTF via the Enterprise Canal, a 25-mile circuitous, open channel that runs through agricultural and urban areas. The SWTF supplies Fresno with about 20 MGD. During peak demand, the SWTF provides approximately 15% of Fresno's potable water. During low demand, the SWTF provides over 30% of Fresno's potable water (City of Fresno, 2011).
- **Near Future:** Construction of a 5-mile pressurized pipeline directly from the Friant-Kern canal to the SWTF is planned. The pipeline will provide raw water quality enhancements, additional public health protection, and adequate hydraulic head to operate the SWTF without supplemental lift. After the pipeline is completed, the Enterprise Canal will become a secondary source of surface water supply for the City (City of Fresno, 2011).

- **2014:** The City of Fresno plans to bring a new 70 MGD surface water treatment plant (SWTP) online and double the capacity of the existing SWTP.
- **2025:** The new SWTP will increase the City of Fresno's surface water supply from 30 MGD (current capacity) to 140 MGD. The increased use of surface water in place of groundwater will lower the total amount of salt that enters the RWRF.

### *ii. Industrial Source Control/Pretreatment Program*

In 1996, the RWRF staff developed and implemented an "EC Source Control Program" for industrial users to voluntarily reduce or maintain current levels of electrical conductivity. Salt audits were performed at all permitted industrial user facilities to determine which process areas could undergo waste minimization or process changes to reduce the amount of salt discharged to the RWRF. Facilities using water softeners were required to ensure the most efficient use of salt-containing products. Facilities replacing water softeners were asked to install salt-free or on-demand systems. Industrial users are regularly informed of current salinity issues in the Central Valley.

In 2008, the City of Fresno updated the Fresno Municipal Code to provide legal authority to require Best Management Practices (BMPs) implementation by industrial and commercial dischargers. BMPs can reduce the quantity of salt discharged during internal operations. Additionally, the City of Fresno has the authority to impose a numeric local limit on one or more salinity constituents through its industrial Pretreatment Program. Instituting a local limit on salinity would involve several steps and could take five to ten years to be fully implemented, assuming all facilities were in compliance (Carollo, 2009).

### *iii. Residential Source Control*

Residential discharges contain lower salt concentrations than industrial discharges; however, residential flow is much higher, resulting in larger salt loadings to the RWRF. Salt reduction from residential sources requires public education on the impacts salt-producing products and actions such as detergents, soaps, salt-based water softeners, other household cleaners, and food-processing habits.

The City of Fresno's salinity outreach program, which began in 2007, promotes residential waste minimization through the "Salt is Serious" campaign. This campaign aims to reduce the domestic use of water, salt-containing products, and water softeners. In May 2008, the City of Fresno was selected by the National Association of Clean Water Agencies as a recipient of its National Environmental Achievement Award for Public Information Education in recognition of the campaign, which has included television commercials in English and Spanish on local and cable television channels (aired until October, 2007), radio spots in English, Spanish, and Hmong, distribution of promotional material at the local Home and Garden Show, and an insert in residential utility bills urging homeowners to disconnect their water softeners. Newspaper inserts are planned for the future.

Controlling the discharge of sodium from self-regenerating water softeners (SRWS) would reduce salinity in the RWRF effluent. Based on typical data gathered from other California cities, residential use of SRWS is estimated to account for approximately 7% of the TDS influent load to the RWRF (Carollo, 2009). If all SRWS in the City of Fresno were eliminated, RWRF influent salinity levels could be reduced by approximately 35 mg/L of TDS, or 65 µmhos/cm of EC (Carollo, 2009).

A voluntary, incentive-based SRWS removal program would cost approximately $15 million if accomplished through a rebate program where residents were paid $500 each to disconnect their SRWS. The City of Fresno could also update its building code to prohibit builders from installing plumbing connections for water softeners in new homes unless specifically requested by the homebuyer. In these cases, it is likely that the maximum possible salinity reduction would not be realized for 12 or more years, based on the useful life of SRWS and the time needed to implement programs targeting residential audiences (Carollo, 2009). Increasing the percentage of surface water in the water supply will act to reduce the need for SRWS.

### e. Source Control Summary

By implementing changes to water supply and industrial source control practices, two entities have achieved reductions in effluent EC concentrations. The City of Tracy has achieved a 25% reduction in WWTP effluent EC, from average monthly levels of 1580 µmhos/cm prior to 2007, to 1191 µmhos/cm in more recent years (March 2009 – April 2011). The City of Manteca has achieved an approximate 32% reduction in WQCF monthly average effluent EC.

The City of Stockton recently completed construction of the Delta Water Supply Project (DWSP) as a new, supplemental surface water supply. The DWSP will augment local groundwater and existing surface water supplies to meet the City of Stockton's water demands. Phase 1 of the DWSP became operational in June 2012 and will provide approximately 27% of Stockton's water supply. Average salinity levels in DWSP raw water are expected to be lower than the average levels in existing groundwater supplies; therefore, operation of the DWSP is expected to reduce water supply salinity contributions to the City of Stockton RWCF (RBI, 2009). By implementing changes to water supply and industrial and residential source control practices, the City of Fresno also expects to reduce salinity levels in RWRF effluent; however, no specific percent reduction has been estimated.

## V. WATER QUALITY IMPACTS ANALYSIS

This section contains a description of the water quality impacts associated with implementation of either a variance for three Delta communities (Tracy, Stockton and Manteca) or a case-by-case exception for the City of Fresno. In each case, the water quality impact would be a delay in water quality changes in downstream receiving water quality (three (Delta communities) and any other Delta surface water discharges), or down-gradient groundwater quality (City of Fresno). The incremental water quality changes described in this section represent the difference between current ambient water quality and a future condition that would occur if the communities in question implemented reverse osmosis (RO) treatment of a portion of their total discharge (at full permitted discharge capacity) as a means to meet final effluent limits for EC in their current permits.

### a. Effect of Establishing Variance Policy and Granting Variance for Three Delta Communities

If a water quality standards variance was implemented for the three Delta communities described in the preceding sections, the net effect would be to delay further action to design and construct new RO treatment facilities to achieve compliance with existing final effluent limits for EC. This would produce an associated delay in any change in ambient water quality in the Delta associated with the discharge from the three communities. Given the fact that variances are approved in five-year increments as part of the NPDES permitting process, the probable minimum delay in question would be five years. However, given the pace and complexity of the ongoing efforts to re-examine and potentially modify the EC water quality objectives in the Delta, it is plausible to project up to a ten-year period to resolve the uncertainty regarding these objectives. This timeline is consistent with the master SNMP covering the entire Central Valley (CV-SNMP) that is being developed by CV-SALTS for Central Valley Water Board review in May 2014. The CV-SNMP is anticipated to be adopted as a Basin Plan Amendment in 2015. Local-scale management of salinity would then follow in subsequent years according to the guidelines established in the CV-SNMP. As a result, the temporary delay in a change in ambient water quality associated with the implementation of a salinity objective variance in the Delta is projected to be in the range of five to ten years.

Although adding RO treatment systems to each of the facilities would result in higher quality final effluent, doing so is not likely to result in a measurable improvement (i.e., lowering) of EC levels in the receiving water, as reported by a 2007 DWR study. A modeling evaluation was completed for the City of Tracy and Mountain House Community Services District that examined impacts of discharges from these facilities on receiving water EC concentrations (DWR, 2007). The Department of Water Resources (DWR) Delta Simulation Model 2 (DSM2) model was used to predict the resulting effluent volume fractions, and the receiving water and effluent volume fractions were each weighted with the appropriate EC concentration, thus allowing the change in EC (from upstream to downstream of the discharge) to be estimated. It was concluded that, in the worst-case scenario, the City of Tracy WWTP discharge "made up a small portion of the difference between actual measured EC upstream and downstream of the discharge, so it was assumed that the remainder of the increases must have been caused by 'other sources' of EC (e.g., agricultural activities, shallow groundwater discharge to receiving waters)", and increases due to the City of Tracy WWTP discharge "were about an order of magnitude less than the 'other sources'" (DWR, 2007). In addition, RO or other salt removal technologies necessary to meet potential water quality based effluent limits (WQBELs) for EC were considered. It was concluded that "requiring WQBELs, compared to limiting the discharge to current levels, did not provide substantial reductions in [receiving water] EC" (DWR, 2007).

### *i. Surface Water Quality Impact Calculations*

#### *i.1 Cities of Stockton and Manteca*

The near-field[1] water quality impacts assessment evaluates the effect of a short-term variance from meeting final effluent limits for EC, as compared to a future condition where the communities treat a portion of their total discharge with RO in order to meet final effluent limits. Because each treatment facility currently produces treated effluent having unique EC and TDS concentrations (see **Section II**) based on the levels of these parameters present in their influents and the particular treatment processes employed by each facility, each treatment plant would need to treat a different percentage of their total discharge with a split-stream RO treatment process in order to meet final effluent limits for EC. Near-field effects of the implementation of RO treatment on receiving water quality will occur at a relatively short distance (1 -2 miles) downstream of a discharger's outfall where treated effluent and ambient river water are reasonably well-mixed. Downstream receiving water EC levels without RO implementation (i.e., current condition) are calculated to estimate the future (five to ten years) ambient water quality with the granting of a salinity variance. Comparing estimated future water quality with RO treatment to water quality that would result from the granting of a salinity variance – in essence, no change from the current condition – shows the impact of granting a variance for a five to ten year period.

Near-field water quality impacts for EC are estimated for the cities of Stockton and Manteca using the following four parameters which characterize treatment plant effluent and receiving water quality:

1. Treatment plant effluent EC concentration with and without RO treatment;
2. Average upstream receiving water EC concentration;
3. Permitted treatment plant effluent flow rate at build-out;
4. Average upstream receiving water flow.

The estimated near-field water quality impacts were calculated using the following mass balance equation:

$$C_{downstream} = \frac{\left((C_{upstream})(Q_{upstream})\right) + \left((C_{eff})(Q_{eff} \times 1.55)\right)}{\left(Q_{upstream} + (Q_{eff} \times 1.55)\right)}$$

[1] Near-field water quality impacts refer to localized impacts just downstream of the discharge that occur before effluent and receiving water are completely mixed.

Where: $C_{downstream}$ = Downstream receiving water EC concentration

$C_{upstream}$ = Upstream receiving water EC concentration

$C_{eff}$ = Treatment plan effluent EC concentration

$Q_{upstream}$ = Upstream receiving water flow (cfs)

$Q_{eff}$ = Treatment plant effluent flow (MGD)

### *i.2 City of Tracy*

Near- field and regional water quality impacts due to the implementation of RO treatment for the City of Tracy's discharge were calculated using the methodology developed in the DWR DSM2 modeling evaluation of the City of Tracy and Mountain House Community Services District (MHCSD) discharges to the south Delta (DWR, 2007). In the original DWR study, the DSM2 model was used to estimate daily average wastewater volume fractions at 14 south Delta locations for Tracy and MHCSD. In the current analysis, modeled volume fraction data for four south Delta locations were used in the following equation to estimate the increase in ambient receiving water EC concentration at a specific location due to the City of Tracy's effluent:

$$C_{downstream} = (C_{eff} - C_{upstream})\left(\frac{Volume\ Fraction}{100}\right)\left(\frac{Q_{eff\ actual}}{Q_{eff\ total}}\right)$$

Where: $C_{downstream}$ = Downstream receiving water EC increase above upstream EC concentration

$C_{eff}$ = Treatment plan effluent EC concentration

$C_{upstream}$ = Upstream receiving water EC concentration

$Q_{eff\ actual}$ = Treatment plant effluent flow under specific discharge scenario (MGD)

$Q_{eff\ total}$ = Treatment plant effluent flow at permitted capacity (MGD)

In addition to assessing the near-field change in EC just downstream of the Tracy discharge with implementation of RO treatment, the above equation was also used to estimate changes in ambient EC concentrations at the following regional Decision 1641 (D-1641) salinity compliance locations:

- Old River at Tracy Road Bridge
- Old River at Middle River
- San Joaquin River at Brandt Bridge

### *i.3 WQ Impact Calculation Assumptions*

Current average effluent EC concentration from April 1 through August 31 and future effluent EC concentration with RO treatment (designed to meet the final EC effluent limit of 700 µmhos/cm) were used to estimate existing and future impacts, respectively, of treatment plant effluent on downstream receiving water quality. A treatment plant's average effluent EC concentration from April 1 through August 31 was used in the analysis because it is greater than the average effluent EC concentration observed from September 1 through March 31, and the former concentration would be used as a design criterion for the proper sizing of a RO treatment facility. Average upstream receiving water EC concentrations were calculated using data collected at a treatment plant's RSW-001 monitoring location. The average is used for the receiving water because the analysis is strictly based on evaluating the change in receiving water quality. Ambient RSW-001 concentrations serve as the basis for comparing the magnitude of future change in receiving water quality due to the granting of a salinity variance as compared to implementation of RO treatment. The current permitted capacities of the Stockton (55 MGD average dry weather flow (ADWF)) and Manteca (17.5 MGD ADWF) facilities were used for estimating water quality impacts because impacts would be greatest at these flow rates, and hence represent a worst case condition when the facilities discharge at their permitted capacities. For the City of Tracy water quality impacts analysis, $Q_{eff\ actual}$ and $Q_{eff\ total}$ were both set to 16 MGD (ADWF) as this flow rate would be the permitted capacity of the facility at a future point in time when RO treatment would be implemented.

### *ii. Results and Analysis*

The incremental, near-field water quality changes in ambient EC concentrations estimated to occur with implementation of partial RO treatment at the cities of Tracy, Stockton, and Manteca are shown in **Table 8**. These estimates are described as "Future Baseline with RO" as they describe a future ambient water quality condition with implementation of RO by the three Delta communities. Also shown in **Table 8** are estimates of future ambient water quality with the granting of a salinity variance. These estimates are described as "Future WQ with Variance". Regional or far-field changes in ambient EC concentrations estimated to occur with implementation of partial RO treatment at the Tracy WWTP and the granting of a salinity variance for the City are presented in **Table 9**.

With regard to near-field changes in EC concentrations in receiving waters downstream of the three subject discharges (see **Table 8**), they are estimated to range from 0.31 percent (Manteca WQCF during dry/below normal water years) to 2.68 percent (Tracy WWTP under high Delta exports). These slight increases in near-field ambient EC concentrations associated with the granting of a salinity variance are not significant, but are above those calculated for each of the Delta communities with construction and operation of RO facilities to achieve compliance with an EC objective of 700[2] µmhos/cm. Note that this analysis presumes that the existing water quality objective of 700 µmhos/cm, and the effluent limits derived from such an objective will be retained in the future. As detailed elsewhere, this outcome is uncertain. The future ambient water quality estimated to occur as the result of granting a salinity variance represents a delayed minor improvement in water quality as estimated for the future condition with implementation of RO.

The incremental, far-field water quality changes presented in **Table 9** show that the benefit of RO treatment of a portion of the Tracy WWTP discharge to lower EC levels in the receiving water is quickly diminished beyond a short distance downstream of the WWTP outfall. The DWR DSM2 modeling evaluation assumed that the South Delta Improvement Project's (SDIP) permanent flow control structures (gates) would be in place at several locations in the south Delta by the time the WWTP was granted a permitted capacity of 16 MGD (ADWF). With the

[2] Note that RO treatment will be designed to meet 700 µmhos/cm effluent limitation using a 25% safety factor to address the range of influent EC concentrations observed at the treatment facility.

permanent gates in place, no WWTP effluent is anticipated to reach the D-1641 salinity compliance locations in Middle River at Mowery Bridge or the San Joaquin River at Brandt Bridge. As such, the DMS2 model estimates no change (0.00%) in ambient EC concentrations at these two locations, as shown in **Table 9**. This information suggests that the RO treatment of the City of Tracy's discharge to meet a final EC effluent limit of 700 µmhos/cm will have only a slight localized effect on Old River EC concentrations and will have no impact on the control of salts in the south Delta.

**Table 8: Summary of Incremental, Near-Field Water Quality Changes Associated with the Implementation of Partial RO Treatment and the Granting of a Salinity Variance for Three Delta Dischargers.**

| | Average Upstream Receiving Water EC (µmhos/cm) | Receiving Water Flow (cfs) | Average Facility Effluent EC (µmhos/cm) | Facility Discharge (MGD) | Estimated Downstream Receiving Water EC (µmhos/cm) | Estimated % Change in Downstream EC(1) |
|---|---|---|---|---|---|---|
| **TRACY WWTP** | | | | | | |
| ***Low Delta Export*** | | | | | | |
| Future Baseline with RO | 688(2) | (3) | 700 | 16 | 689 | |
| Future WQ with Variance | 688 | (3) | 1,223(4) | 16 | 706 | **2.44%** |
| ***High Delta Export*** | | | | | | |
| Future Baseline with RO | 688 | (3) | 700 | 16 | 689 | |
| Future WQ with Variance | 688 | (3) | 1,223 | 16 | 708 | **2.68%** |
| **STOCKTON RWCF** | | | | | | |
| Future Baseline with RO | 521(5) | 3076(6) | 700 | 55 | 526 | |
| Future WQ with Variance | 521 | 3076 | 1,111(7) | 55 | 537 | **2.06%** |
| **MANTECA WQCF** | | | | | | |
| ***Dry/Below Normal WY*** | | | | | | |
| Future Baseline with RO | 424(8) | 1250(9) | 700 | 17.5 | 430 | |
| Future WQ with Variance | 424 | 1250 | 763(10) | 17.5 | 431 | **0.31%** |
| ***Critical Water year*** | | | | | | |
| Future Baseline with RO | 424 | 600(9) | 700 | 17.5 | 436 | |
| Future WQ with Variance | 424 | 600 | 763 | 17.5 | 439 | **0.62%** |

Notes:
1. Change resulting from implementation of RO and compliance with 700 µmhos/cm final effluent limit.
2. Old River upstream EC is the average of data collected at the Tracy WWTP R-1 station from 2007 to 2010.
3. Downstream ambient concentrations were calculated using the DSM2 model completed for the City of Tracy and Mountain House CSD (DWR, 2007), high export and low export scenarios, summer (August) assumption.
4. Tracy WWTP effluent EC is the average of data collected from 2009 to 2010, summer months only (April-August).
5. San Joaquin River upstream EC is the average of data collected at the Stockton WQCF R-1 station from 2007 to 2011.
6. San Joaquin River harmonic flow from USGS gauge 11304810 – San Joaquin River at Garwood Bridge (near Stockton) from March 1998 – March 2009.
7. Stockton WQCF effluent EC is the average of data collected from 2007 to 2011, summer months only (April-August).
8. San Joaquin River upstream EC is the average of data collected at the Manteca WQCF R-1 station from 2010 to 2011.
9. San Joaquin River flow near Manteca is taken from the City of Manteca Thermal Plan Exception Analysis Final Report (LWA, 2006).
10. Manteca WQCF effluent EC is the average of data collected from 2008 to 2011, summer months only (April-August).

**Table 9: Summary of DWR DSM2-Modeled, Incremental, Far-Field Water Quality Changes Associated with Implementation of Partial RO Treatment at the Tracy WWTP and the Granting of a Salinity Variance.**

| | Low Delta Export | | | High Delta Export | | |
|---|---|---|---|---|---|---|
| | Estimated Ambient EC | | Est. % EC Change | Estimated Ambient EC | | Est. % EC Change |
| Location (moving downstream) | Baseline with RO | With Variance | | Baseline with RO | With Variance | |
| D/S of Tracy WWTP Discharge | 689 | 706 | 2.44 | 689 | 708 | 2.68 |
| Old River at Tracy Rd. Bridge | 688 | 699 | 1.47 | 688 | 689 | 0.08 |
| Old River at Middle River | 688 | 688 | 0.00 | 688 | 688 | 0.00 |
| SJR at Brandt Bridge | 688 | 688 | 0.00 | 688 | 688 | 0.00 |

DSM2 Model input:
- Effluent permitted flow: 16 MGD
- Current effluent EC level: 1223 μmhos/cm
- Current ambient EC level: 688.23 μmhos/cm
- River flows were determined through modeling.

The estimated percent change in EC concentrations in downstream receiving waters presented in **Table 8** and **Table 9** were calculated based on each discharger providing RO treatment to only a portion of its discharge to produce a blended effluent that would meet a final EC effluent limit of 700 μmhos/cm. If the dischargers were to treat their entire effluent flow with RO, the resulting estimated changes in downstream ambient EC concentrations would still be small, ranging for 3.63 percent (Manteca WQCF during dry/below normal water years) to 7.27 percent (Manteca WQCF during critical water years), as shown in **Table 10**.

Because the methodologies, assumptions, and available data used in estimating changes in downstream EC concentrations with implementation of RO treatment varied for each of the three Delta dischargers, further discussion of the underlying information used in these analyses is warranted as a means to explain how the estimated water quality impacts relate to broader salinity concerns in the Delta.

**Table 10: Summary of Incremental, Near-Field Water Quality Changes Associated with the Implementation of Full RO Treatment and the Granting of a Salinity Variance for Three Delta Dischargers.**

| | Average Upstream Receiving Water EC (µmhos/cm) | Receiving Water Flow (cfs) | Average Facility Effluent EC (µmhos/cm) | Facility Discharge (MGD) | Estimated Downstream Receiving Water EC (µmhos/cm) | Estimated % Change in Downstream EC(1) |
|---|---|---|---|---|---|---|
| **TRACY WWTP** | | | | | | |
| ***Low Delta Export*** | | | | | | |
| Future Baseline (with RO) | 688(2) | (3) | 39(4) | 16 | 667 | |
| Future WQ with Variance | 688 | (3) | 1,223(5) | 16 | 706 | **5.52%** |
| ***High Delta Export*** | | | | | | |
| Future Baseline (with RO) | 688 | (3) | 39(4) | 16 | 665 | |
| Future WQ with Variance | 688 | (3) | 1,223(5) | 16 | 708 | **6.06%** |
| **STOCKTON RWCF** | | | | | | |
| Future Baseline (with RO) | 521(6) | 3076(7) | 36(4) | 55 | 508 | |
| Future WQ with Variance | 521 | 3076 | 1,111(8) | 55 | 537 | **5.40%** |
| **MANTECA WQCF** | | | | | | |
| ***Dry/Below Normal WY*** | | | | | | |
| Future Baseline (with RO) | 424(9) | 1250(10) | 25(4) | 17.5 | 416 | |
| Future WQ with Variance | 424 | 1250 | 763(11) | 17.5 | 431 | **3.63%** |
| ***Critical Water year*** | | | | | | |
| Future Baseline (with RO) | 424 | 600(9) | 25(4) | 17.5 | 407 | |
| Future WQ with Variance | 424 | 600 | 763 | 17.5 | 439 | **7.27%** |

Notes:

1. Change resulting from implementation of RO and compliance with 700 µmhos/cm final effluent limit.
2. Old River upstream EC is the average of data collected at the Tracy WWTP R-1 station from 2007 to 2010.
3. Downstream ambient concentrations were calculated using the DSM2 model completed for the City of Tracy and Mountain House CSD (DWR, 2007), high export and low export scenarios, summer (August) assumption.
4. Average effluent EC with RO treatment of a facility's entire discharge is based on percent salt rejection of the RO process and average TDS concentration of the facility from April through August.
5. Tracy WWTP effluent EC is the average of data collected from 2009 to 2010, summer months only (April-August).
6. San Joaquin River upstream EC is the average of data collected at the Stockton WQCF R-1 station from 2007 to 2011.
7. San Joaquin River harmonic flow from USGS gauge 11304810 – San Joaquin River at Garwood Bridge (near Stockton) from March 1998 – March 2009.
8. Stockton WQCF effluent EC is the average of data collected from 2007 to 2011, summer months only (April-August).
9. San Joaquin River upstream EC is the average of data collected at the Manteca WQCF R-1 station from 2010 to 2011.
10. San Joaquin River flow near Manteca is taken from the City of Manteca Thermal Plan Exception Analysis Final Report (LWA, 2006).
11. Manteca WQCF effluent EC is the average of data collected from 2008 to 2011, summer months only (April-August).

### *ii.1 Tracy WWTP WQ Impacts Analysis*

The current water quality impacts analysis performed for the City of Tracy WWTP (**Table 8, Table 9**) was based on the 2007 DSM2 model evaluation performed by DWR (DWR, 2007). The 2007 evaluation was overseen by a stakeholder group that included representatives from the City of Tracy, MHCSD, South Delta Water Agency, California Sportfishing Protection Alliance, DWR, and the Central Valley Water Board. The stakeholder group selected modeling assumptions and input parameters that would represent appropriate and reasonable worst-case water quality scenarios in the south Delta when running the DSM2 model. These assumptions and input parameters included:

- 1985 tide data from the south Delta that included two neap tides in the tidal cycle in August, which would represent a worst-case condition when flows are critically low and agricultural use in very high. The low flushing affect of neap tides causes agricultural return water and wastewater flows to build up in south Delta channels resulting in elevated salinity.
- High and low export pumping scenarios:
  - High Export Pumping: SWP = 6,800 cfs, CVP = 4,600 cfs
  - Low Export Pumping: SWP = 1,500 cfs, CVP – 1,000 cfs
- San Joaquin River flow rate of 1,000 cfs at Vernalis.
- SDIP permanent gates in place to represent future conditions.

Based on the above assumptions and input parameters, the results of the 2007 DWR model evaluation and the current water quality impacts analysis are conservative. Percent change in near-field and far-field receiving water EC concentrations under less critical conditions would be smaller than those presented in **Table 8** and **Table 9** for the City of Tracy WWTP discharge. **Table 8** and **Table 9** were used to create **Figure 7** through **Figure 10**, in which the estimated near- and far-field changes in downstream receiving water EC concentrations under low and high Delta export conditions with implementation of partial RO treatment at the WWTP are shown. The estimated changes in EC with RO treatment represent slight decreases (0.0% - 2.66%) in EC levels as compared to those estimated for the future with variance condition.

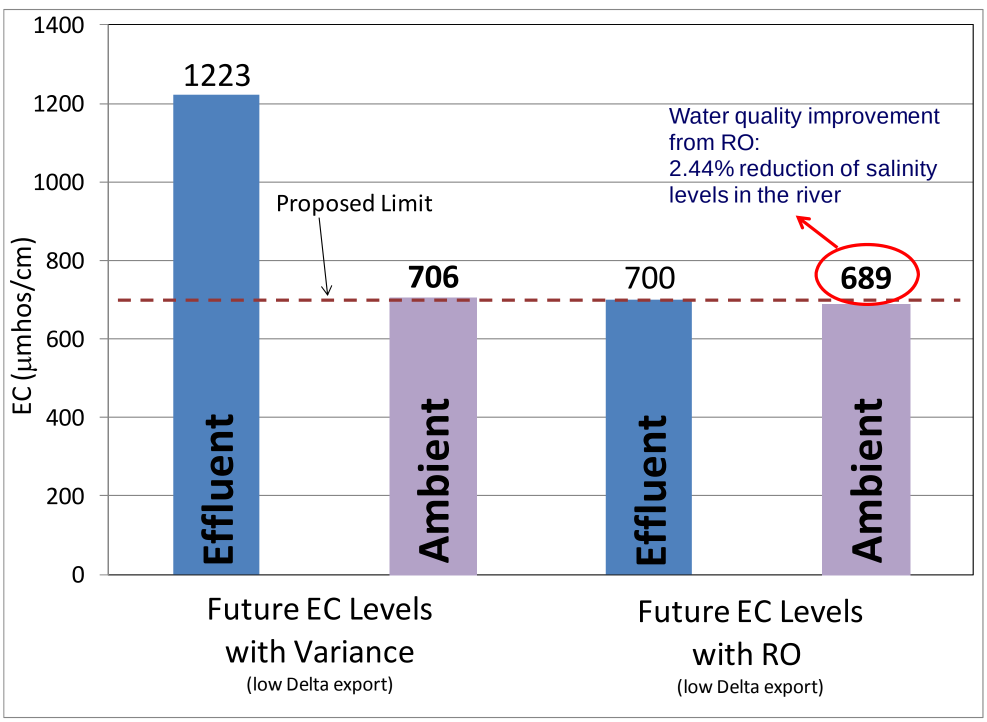


**Figure 7: City of Tracy WWTP – Future Incremental Near-Field Water Quality Changes Associated with Implementation of RO Treatment under Low Delta Export Conditions.**

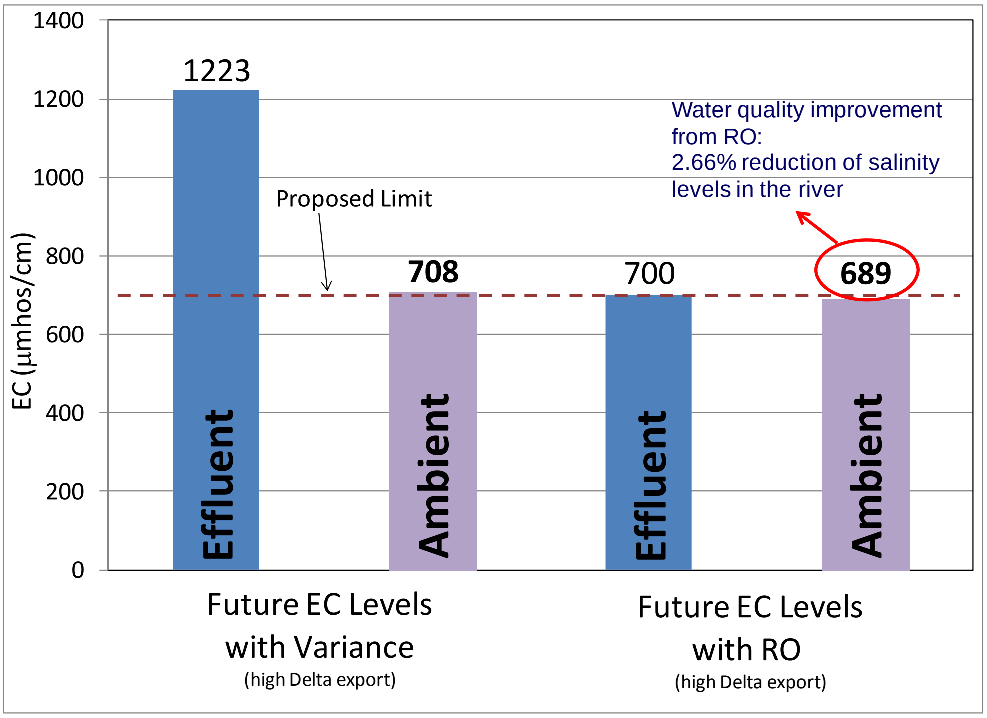


**Figure 8: City of Tracy WWTP – Future Incremental Near-Field Water Quality Changes Associated with Implementation of RO Treatment under High Delta Export Conditions.**

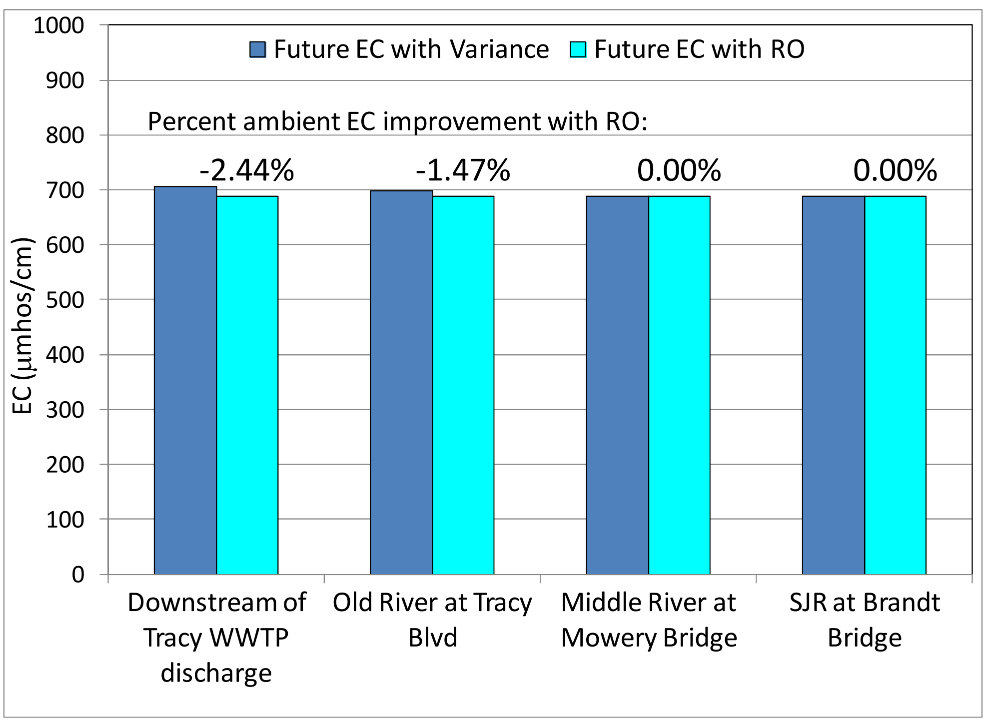


**Figure 9: City of Tracy WWTP – Future Incremental Far-Field Water Quality Changes Associated with Implementation of RO Treatment under Low Delta Export Conditions.**

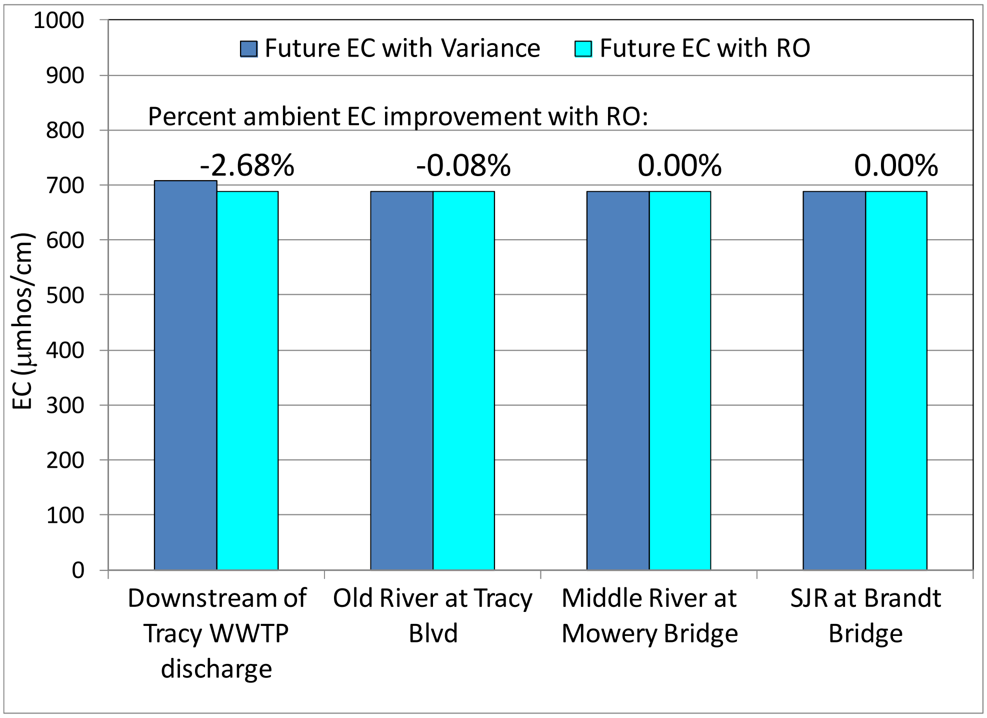


**Figure 10: City of Tracy WWTP – Future Incremental Far-Field Water Quality Changes Associated with Implementation of RO Treatment under High Delta Export Conditions.**

### *ii.2 Stockton RWCF WQ Impacts Analysis*

The near-field water quality impacts estimated for the City of Stockton RWCF with implementation of partial RO treatment of the City's discharge and the granting of a salinity variance are based on a simple mass balance equation. The Stockton analysis used a less conservative receiving water flow rate than used for the Tracy and Manteca's analyses. However, the San Joaquin River harmonic mean flow (March 1998 – March 2008[3]) used in the Stockton analysis is arguably a more appropriate flow rate to use than a critical low flow, for example, as it represents a long-term average flow condition that should be used when estimating water quality impacts of pollutants whose long-term, cumulative mass loadings create impacts on downstream water quality, such as salts. The harmonic mean flow is used by the Central Valley Water Board to evaluate long-term dilution of wastewater discharges. The harmonic mean estimates the average dilution ratio (i.e., 1/flow) of a stream. Very high flows provide high dilution of wastewater effluent, but doubling the flow reduces the effluent concentrations in the river by a factor of 2. The harmonic mean discounts the dilution value of very high flows, and emphasizes periods of lower flow when effluent concentrations are relatively high. The estimated, near-field percent change in EC concentration (2.06% decrease) calculated for the San Joaquin River downstream of the WQCF discharge with implementation of partial RO treatment at the WWQF is shown in **Table 8** and **Figure 11**. The 2.06% change represents a slight decrease in EC levels as compared to those estimated for the future with variance condition.

[3] The period March 1998 through March 2008 did include three Wet water years, two Above Normal water years, three Dry water years, one Below Normal water year, and two Critical water years.

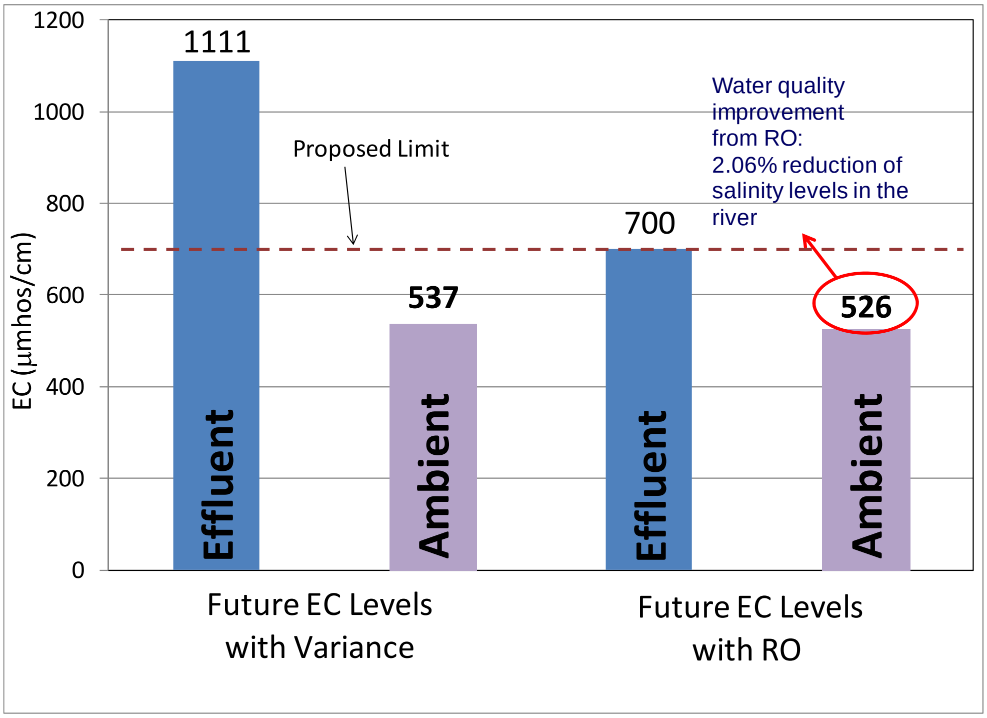


**Figure 11: City of Stockton RWCF – Future Incremental Near-Field Water Quality Changes Associated with Implementation of RO Treatment.**

### *ii.3 Manteca WQCF WQ Impacts Analysis*

Similar to the Stockton analysis described above, the near-field water quality impacts estimated for the City of Manteca WQCF with implementation of partial RO treatment of the City's discharge and the granting of a salinity variance are based on a simple mass balance equation. However, due to the availability of San Joaquin River at Vernalis flows estimated for critical (600 cfs) and dry/below normal (1250 cfs) water year types (LWA, 2006), these more conservative flow rates were used in the current water quality impacts analysis. The use of these more conservative flow rates parallels the use of the 1985 flow data used in the DWR DSM2 modeling evaluation of the Tracy WWTP discharge. Similar to the Tracy analysis, the percent change in near-field receiving water EC concentrations for the City of Manteca under less critical flow conditions would be smaller than those presented in **Table 8** and **Figure 12** and **Figure 13** for the WQCF discharge. Because the percent change in EC concentrations estimated using the more conservative San Joaquin River at Vernalis flow rates ranged from 0.31% (dry/below normal water years) to 0.62% (critical water years), the use of a long-term average flow rate, such as the harmonic mean, would provide an even smaller, future, incremental, near-field percent change in downstream receiving water EC concentration with implementation of partial RO treatment when compared to a future with variance condition.

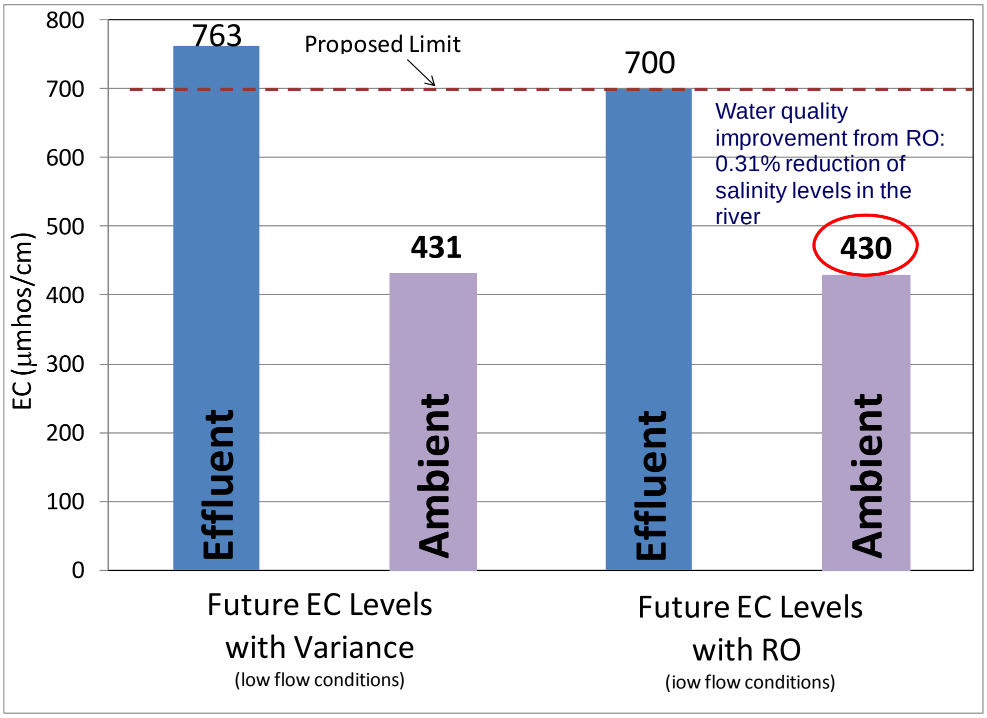


**Figure 12: City of Manteca WQCF – Future Incremental Near-Field Water Quality Changes Associated with Implementation of RO Treatment under Dry/Below Normal Water Year Conditions.**

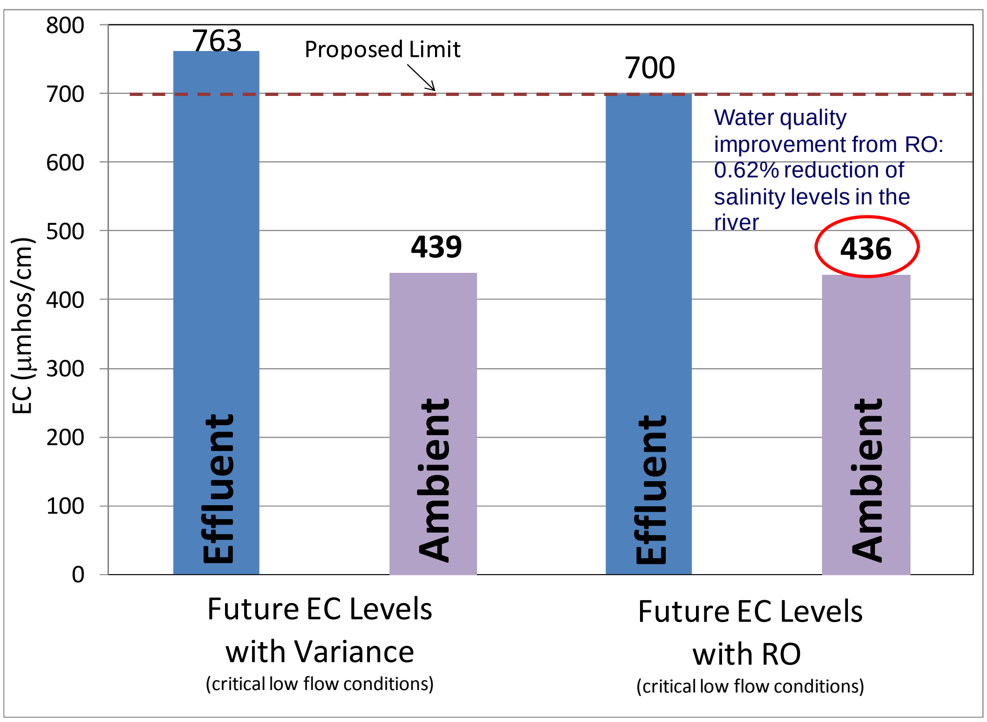


**Figure 13: City of Manteca WQCF – Future Incremental Near-Field Water Quality Changes Associated with Implementation of RO Treatment under Critical Water Year Conditions.**

### *iii. Assessment of Variance Effects on San Joaquin River Flow Requirements*

Under State Water Board Decision 1641, the United States Bureau of Reclamation (USBR) is obligated to meet salinity objectives in the San Joaquin River at Vernalis. The salinity objectives at Vernalis are seasonal, with a 1000 µmhos/cm 30-day running average of mean daily EC from September 1 through April 29, and a 700 µmhos/cm 30-day running average of mean daily EC from April 30 through August 31. The primary tool used by USBR for meeting salinity objectives at Vernalis is the release of water from New Melones Reservoir into the Stanislaus River to affect salinity conditions at Vernalis.

The concern exists that salinity changes in the Delta resulting from a variance from salinity effluent limits for the communities of Tracy, Stockton and/or Manteca will impact flow releases by the USBR. The issue is twofold: (a) whether, in the absence of a variance, USBR could reduce the amount of flow it releases to meet salinity objectives, or (b) whether the variance would allow increased levels of salinity in the Delta which would increase the obligations of the USBR to release more water.

At issue is whether the releases by USBR are driven by salinity levels at Vernalis (at the rim of the Delta and outside the influence of the wastewater discharges) or by salinity levels at interior locations in the Delta.

In April 2011, the USBR released a report titled “Special Study: Evaluation of Dilution Flow to Meet Interior South Delta Water Quality Objectives” (USBR, 2011). The report was prepared to meet requirements of Water Rights Order 2010-002 issued by the SWRCB in January 2010. The Order required the Department of Water Resources (DWR) and USBR to study the feasibility of controlling salinity through various measures, including increasing flows in the San Joaquin River. The purpose of the April 2011 report was to evaluate the feasibility of meeting interior south Delta water quality objectives through increased San Joaquin River flows.

The evaluation documented in the April 2011 report occurred in three phases: (1) exploration of the relationship between salinity at Vernalis on the San Joaquin River and salinity at the locations in the south Delta where salinity objectives exist, (2) evaluation of the range of additional San Joaquin River flows at Vernalis that would be needed to meet the interior south Delta salinity objectives, and (3) an evaluation of the availability of those additional flows.

As stated on page 8 of the report: “Reclamation has been operating the Central Valley Project (CVP) to meet the Vernalis salinity objective since the mid 1990’s. The report continues, “…the 30-day running average of salinity at Vernalis is calculated every day and operations are conducted to meet the 30-day running average that is lower than the objective. This operation uses a “salinity buffer” – an operational salinity goal at Vernalis that is lower than the salinity objective in order to ensure compliance with the objective.” (USBR, 2011).

The report examined the history of compliance with south Delta salinity objectives for the water years 2000 through 2010. The locations for the south Delta objectives are:

- San Joaquin River at Vernalis (Station C-10)
- Old River at Middle River (Union Island; Station C-8)
- San Joaquin River at Brandt Bridge (Station C-6)
- Old River at Tracy Road Bridge (Station P-12)

As shown in Table 1 on page 10 of the report, the compliance history (in terms of percent exceedance on a monthly basis) at each location for the period examined was: (a) San Joaquin River at Vernalis (0%); (b) Old River at Middle River (37%); (c) San Joaquin River at Brandt Bridge (14%); and (d) Union Island (13%) (USBR, 2011). This information shows that USBR has been very effective in its management of salinity at Vernalis through flow releases to the San Joaquin, but that such management has not resulted in compliance with salinity objectives at interior locations of the Delta.

In Table 9 on page 32 of the report, USBR determined the salinity levels at Vernalis that would be required to consistently achieve the existing salinity objectives at the three interior south Delta locations. As shown in the table, achievement of salinity objectives at Old River at Tracy Road Bridge is the controlling condition. The table indicates that compliance with the 700 µmhos/cm objective during the irrigation season at that location would require a salinity level of 298 µmhos/cm at Vernalis. Compliance with the 1000 µmhos/cm objective at that location would require a salinity level of 531 µmhos/cm at Vernalis. After examining the magnitude of San Joaquin River flows required to achieve these salinity levels at Vernalis, the USBR analysis suggests that such an approach would require an unreasonable amount of water (in the range of 1 to 2 million acre-feet in dry years)(page 46). The USBR analysis shows that the largest volumes or water are required during the driest seasons and years when it is least likely to be available (page 40) (USBR, 2011).

The SWRCB has not issued a formal response to the April 2011 USBR report. Given the conclusions of the report, it appears unlikely that a shift from the current practice of using the Vernalis station and Vernalis objectives as the basis for San Joaquin flow requirements will occur. Unless such a change were to occur, the effect of minor salinity changes in the interior Delta associated with implementation of a salinity variance for wastewater discharges is not expected to have an effect on San Joaquin River flow requirements impacting the USBR and its users.

Information provided in a February 2012 report prepared by the SWRCB titled *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives* supports a finding that the management of wastewater effluent discharges will not have a significant effect on South Delta salinity conditions (CSWRCB, 2012). On page 4-7 of the subject report, it is stated that:

> "Salinity levels in the southern Delta are affected primarily by the salinity of water flowing into the southern Delta from the SJR near Vernalis and evapoconcentration of salt in water that is diverted from and discharged back into the southern Delta channels for agricultural purposes. Point sources of salt in the southern Delta have a small overall salinity effect." (CSWRCB, 2012).

On page 4-10 of the same report, it is noted that:

> "DSM2 modeling was conducted by a stakeholder group including DWR in 2007 to better understand the salinity impacts of the new and expanded discharges from the City of Tracy and Mountain House Community Services District wastewater treatment plants. The model analysis concluded that the City of Tracy discharge under reasonable worst case conditions has limited impacts on the salinity problem in the southern Delta as compared to other sources of salinity in the area…" (CSWRCB, 2012)

Combined with the water quality impact analysis provided above, and the findings of the April 2011 USBR report which point to continued reliance on salinity at Vernalis for USBR operations, it is reasonable to conclude that the implementation of a variance for Delta communities will not affect San Joaquin River flow requirements that exist for the USBR under Decision 1641 or other State Water Board authorities.

### b. Effect of Granting a Case-by-Case Effluent Limit Exception for the City of Fresno

As with the Delta communities, if a case-by-case effluent limit exception was granted for the City of Fresno, the net effect would be to delay further action to design and construct new RO treatment facilities to achieve compliance with existing final effluent limits for EC. This would produce an associated delay in any change in groundwater quality down-gradient of the percolation ponds.

The temporary delay in improvement to ambient water quality associated with the granting of a case-by-case effluent limit exception is projected to be in the range of five to ten years. This time period is reasonable given the pace and complexity of the ongoing efforts to develop a comprehensive Salt and Nutrient Management Plan (SNMP) for the Central Valley (see Appendix A). Currently, a master SNMP covering the entire Central Valley (CV-SNMP) is being developed for Central Valley Water Board review in May 2014, with anticipated adoption as a Basin Plan Amendment in 2015. Local-scale management of salinity would then be determined at this future time according to the guidelines established in the CV-SNMP.

#### *i. Groundwater Quality Impact Calculations*

A simple spreadsheet batch-reactor mixing model was used to estimate resulting EC concentrations over a 10-year period in a subsection of the aquifer underlying the Fresno-Clovis Metropolitan RWRF percolation ponds due to contribution of RWRF discharges based on (1) current effluent EC concentrations and (2) EC concentrations from effluent treated to the 766 µmhos/cm effluent limit using microfiltration (MF) and RO. The 766 µmhos/cm target effluent limit was derived from the City's source water EC plus 500 µmhos/cm EC effluent limit, where average EC concentration in the City's source water was estimated to be 266 µmhos/cm.

A mass balance was computed based on background groundwater flow through a representative cross-sectional area of influence and total effluent flow discharged from the RWRF. Volumes were assumed to be fully and evenly mixed over one-year periods, which is consistent with travel times and mixing volumes discussed in Appendix M of the Fresno BPTC Evalution (Carollo, 2009). This approach results in steady-state conditions, meaning that for each one-year mixing period, background groundwater and effluent EC concentrations are assumed to remain constant.

The aquifer underlying the percolation ponds is approximately 275 feet thick, with a thick confining layer present at 275 feet below ground surface (ft bgs) (Appendix M of the Fresno BPTC Evaluation (Carollo, 2009)). Past reports indicate that effluent does not likely migrate downwards below this confining layer. Depth to water is approximately 40-50 ft bgs.

Predicted groundwater impacts from wastewater discharges were calculated using the following equation:

$$C_{GWdown} = (V_{GW} * C_{GWup} + V_{RWRF} * C_{RWRF}) / (V_{GW} + V_{RWRF})$$

Where: $C_{GWdown}$ = Average EC Concentration in Upper Aquifer down-gradient of RWRF percolation ponds (µmhos/cm)

$V_{GW}$ = Volume of groundwater flow beneath RWRF area of influence (L/yr)

$C_{GWup}$ = Average EC Concentration in up-gradient (background) groundwater (µmhos/cm)

$V_{RWRF}$ = Volume of pond effluent discharge (L/yr)

$C_{RWRF}$ = Average EC Concentration in pond effluent discharge (µmhos/cm)

For the purpose of this analysis, mixing is assumed to be confined to the upper, saturated 225 feet of the aquifer, which is divided into two layers based on typical screened intervals of monitoring wells in the vicinity of the RWRF ponds:

- Layer A – 50 to 100 ft bgs
- Layer B – 100 to 275 ft bgs

The total groundwater flow into the study area ($V_{GW}$) was calculated using Darcy's Equation and appropriate hydraulic parameters for the study site, as summarized below and in **Table 11**.

Darcy's Equation:

$$Q = KAi$$

Where: $Q = V_{GW}$ = total subsurface flow mixing with the effluent ($ft^3$/yr)

$K$ = Upper Aquifer hydraulic conductivity (ft/yr)

$A$ = cross-sectional area of mixing ($ft^2$)

$i$ = hydraulic gradient (ft/ft)

**Table 11: Groundwater Flow Parameters Used in the Mixing Model**

| Parameter | Units | Value |
|---|---|---|
| Hydraulic Conductivity, *K* | ft/day | 131 |
| Cross-sectional Area, *A* | $ft^2$ | 7,164,000 |
| Hydraulic Gradient, *i* | ft/ft | 0.005 |

**Hydraulic Conductivity (K)**: Given a transmissivity ($T$) and a saturated thickness of an aquifer ($b$), hydraulic conductivity ($K$) can be calculated using the equation $T = Kb$ (Freeze and Cherry, 1979). Representative values for transmissivity ($T$) and saturated thickness ($b$) in Layers A and B were calculated by Kenneth D. Schmidt and Associates (KDSA) and documented in the memo titled *Fresno Clovis RWRF BPTC Legacy Issues*, dated 11/20/2007, and included as Appendix M of the Fresno BPTC Evaluation (Carollo, 2009). On page 7 of the memo, KDSA assumed a transmissivity ($T$) of 55,000 gallons per day (gpd) for the shallow zone (Layer A) (i.e. $b$=50 ft), and a transmissivity ($T$) of 145,000 gpd for the deep zone (Layer B) (i.e. $b$=175 ft). Using the equation $T$=$Kb$, the hydraulic conductivities for Layer A and Layer B were calculated to be 147 ft/day and 114 ft/day, respectively. As an approximation of the overall hydraulic conductivity for flow moving laterally through Layers A and B, the arithmetic average was computed (131 ft/day) and used in the mixing model (see **Table 11)**. Note that the mixing model assumes vertical mixing through Layers A and B is complete and instantaneous.

**Cross-sectional area (A):** Groundwater flows predominantly to the southwest in the Kings River groundwater basin (DWR-Bulletin 118, 2003) and in the vicinity of the RWRF with an area of elevated groundwater levels underneath the percolation ponds (see **Figure 14**). It is conservatively assumed (based on water level contours and plume boundary estimates in ) that the majority of the effluent mixes within a 1.5 mile area of influence on either side of the percolation ponds perpendicular to the southwest groundwater flow direction. Thus the cross-sectional area (*A*) perpendicular to groundwater flow was calculated assuming a 225 ft saturated thickness of the aquifer (i.e. saturated thickness of Layers A and B combined) by a 1.5 mile radius on either side of the percolation ponds (which extend approximately 3 miles perpendicular to the southwest groundwater flow direction). The cross-sectional area used in the mixing model (see **Table 11)** was calculated as follows:

$$\begin{aligned} \text{Cross-sectional area } (A) &= 225\ ft * (1.5\ mile + 3\ mile + 1.5\ mile) \\ &= 225\ ft * (7920\ ft + 16{,}000\ ft + 7920\ ft) \\ &= 225\ ft * 31{,}840\ ft \\ &= 7{,}164{,}000\ ft^2 \end{aligned}$$

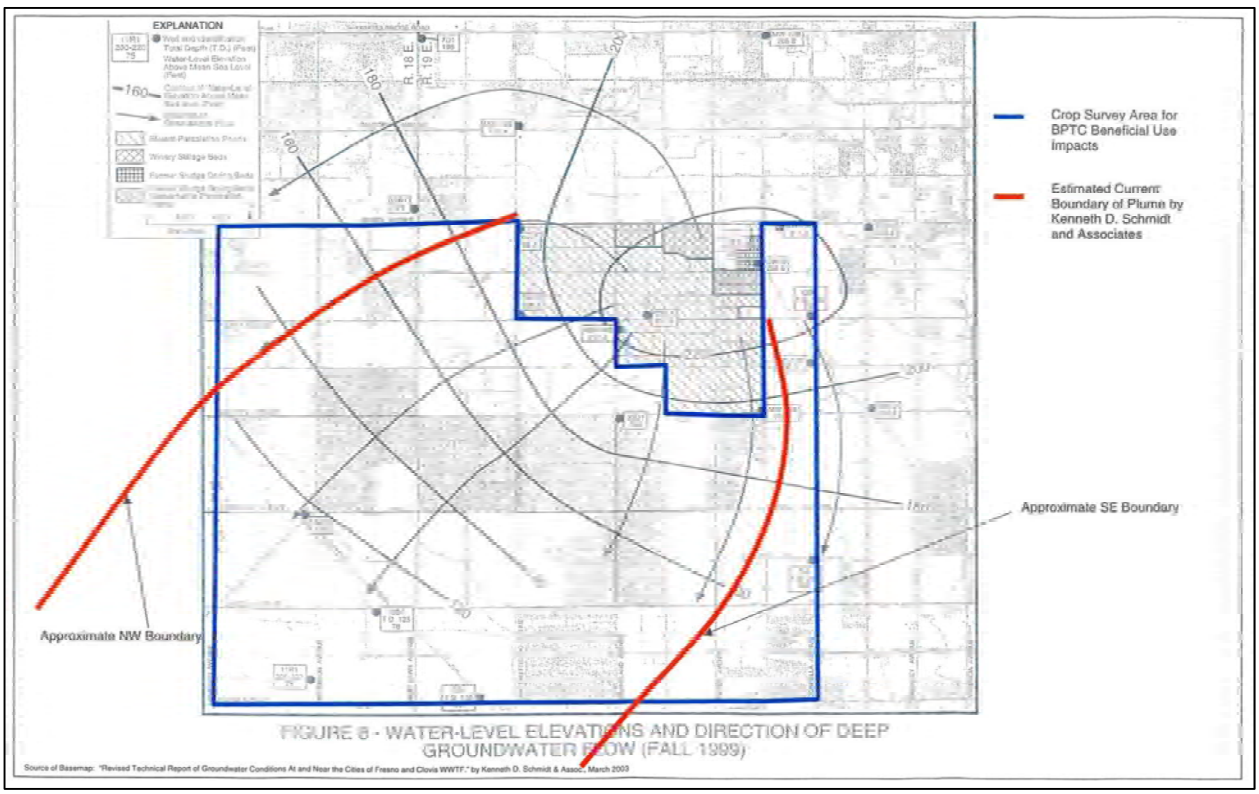


**Figure 14: Groundwater Level Elevations and Flow Direction in the Vicinity of the Fresno-Clovis Metropolitan RWRF (Carollo, 2009).**

**Hydraulic Gradient (i):** Average lateral hydraulic gradients beneath the percolation ponds are given for the shallow (Layer A) and deep (Layer B) aquifer zones on page 6 of the memo by Kenneth D. Schmidt and Associates (KDSA), titled *Fresno Clovis RWRF BPTC Legacy Issues*, dated 11/20/2007, and included as Appendix M of the Fresno BPTC Evaluation (Carollo, 2009). The average hydraulic gradient for Layer A is given in the memo as 20 feet per mile, which corresponds to 0.004 ft/ft. The average hydraulic gradient for Layer B is given in the memo as 30 feet per mile, which corresponds to 0.006 ft/ft. For purposes of this analysis, the average hydraulic gradient between Layer A and Layer B (0.005 ft/ft) was used in the mixing model (see **Table 11**).

The change in groundwater concentrations due to effluent discharge ($C_{GWdown}$) was evaluated for the upper 225 feet of the aquifer underlying the percolation ponds for two scenarios:

1. A simulation representing conditions if a portion of effluent is treated with MF/RO.
2. A simulation representing projected conditions if the case-by-case effluent limit exception were granted (i.e. no treatment with MF/RO)

For both simulations, the current influent flow to the RWRF of 70 MGD was used to represent $V_{RWRF}$, and is assumed to remain constant over the 10-year simulation time.[4] Although about 5% of the total effluent outflow is applied as irrigation water to nearby fields, and about 12% of effluent discharged to the percolation ponds is lost to evaporation (Resolution No. R5-2002-0254-A01 Amending WDR Order No. R5-2001-254 for Fresno-Clovis Metropolitan RWRF), this analysis conservatively assumes that all mass discharged from the RWRF percolates to groundwater. In the irrigation areas, salts tend to concentrate in the shallow aquifer due to evapoconcentration in the soil root zone and subsequent leaching. In the percolation ponds, a small portion of salts may precipitate out before infiltration into the subsurface though this effect is minimized due to high percolation rates. Additional dilution that could result from precipitation is considered negligible and is not incorporated into the mixing model.

The following assumptions were made in this analysis:

- The only sources of EC into the groundwater system are from background groundwater flow and discharge from the RWRF.
- Concentrations are constant during each one-year mixing period.
- The simulation was run for 10 consecutive one-year mixing periods.
- Mass inputs from the RWRF mix fully and completely through the upper saturated 225 feet of the aquifer.
- Apparent degradation in background groundwater concentrations is incorporated into the mixing model.
- Evaporation and precipitation are not incorporated into the mixing model.

---

[4] The average influent flow between March 2010 and February 2011 at the RWRF was 67 MGD, measured as monthly total flow divided by the number of days per month. It is assumed that the influent flow is equivalent to the effluent flow.

### *i.1 Effluent Concentrations ($C_{RWRF}$)*

The recent history of salinity concentrations and loadings for the Fresno-Clovis Metropolitan RWRF is shown in **Figure 15**.

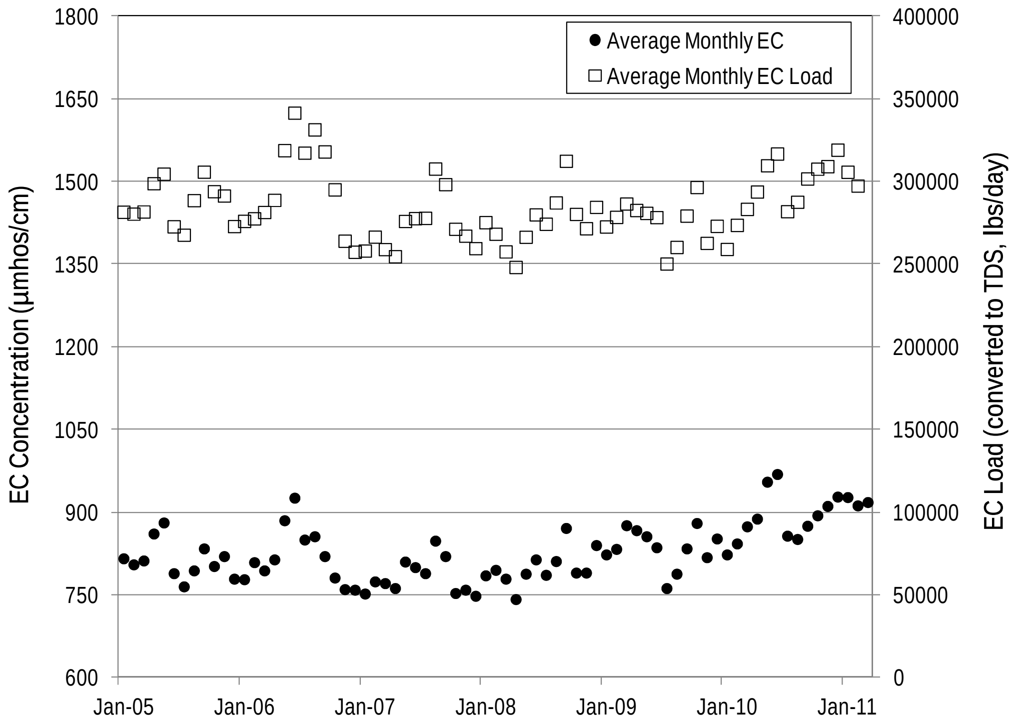


**Figure 15: Fresno-Clovis Metropolitan RWRF – EC Concentrations and Equivalent TDS Loadings (Jan 2005 – Feb 2011).**

Average effluent concentrations ($C_{RWRF}$) for each scenario are provided in **Table 12**. From December 2005 through February 2011, effluent concentrations ranged from 742 to 969 µmhos/cm, with an average of 827 µmhos/cm. For the scenario in which a portion of the effluent is treated with MF/RO, it is assumed that an appropriate portion of effluent will be treated with MF/RO to meet a target EC concentration of 766 µmhos/cm.

**Table 12: Average Effluent EC Concentrations and Corresponding Volume of Effluent Requiring MF/RO Treatment to Reach 766 µmhos/cm Effluent Limitation.**

| Scenario | Average Effluent EC (µmhos/cm) |
|---|---|
| Conditions with a portion of effluent treated with MF/RO | 766 |
| Conditions if the case-by-case effluent limit exception were granted (i.e. no treatment with MF/RO) | 827 (1) |

Note:

1. These averages were derived from Fresno-Clovis Metropolitan RWRF effluent data (December 2005 – February 2011).

### *i.2 Background Groundwater Concentrations ($C_{GWup}$)*

Two sets of up-gradient monitoring wells are monitored regularly: MW-10A and 10B and MW-16A and 16 B (see **Figure 16**). Though previous reports on the study area considered MW-16A and MW-16B to be up-gradient wells, these wells exhibit concentrations much higher than the other up-gradient wells, indicating that MW-16A and MW-16B may be in the area of influence of the RWRF Ponds.

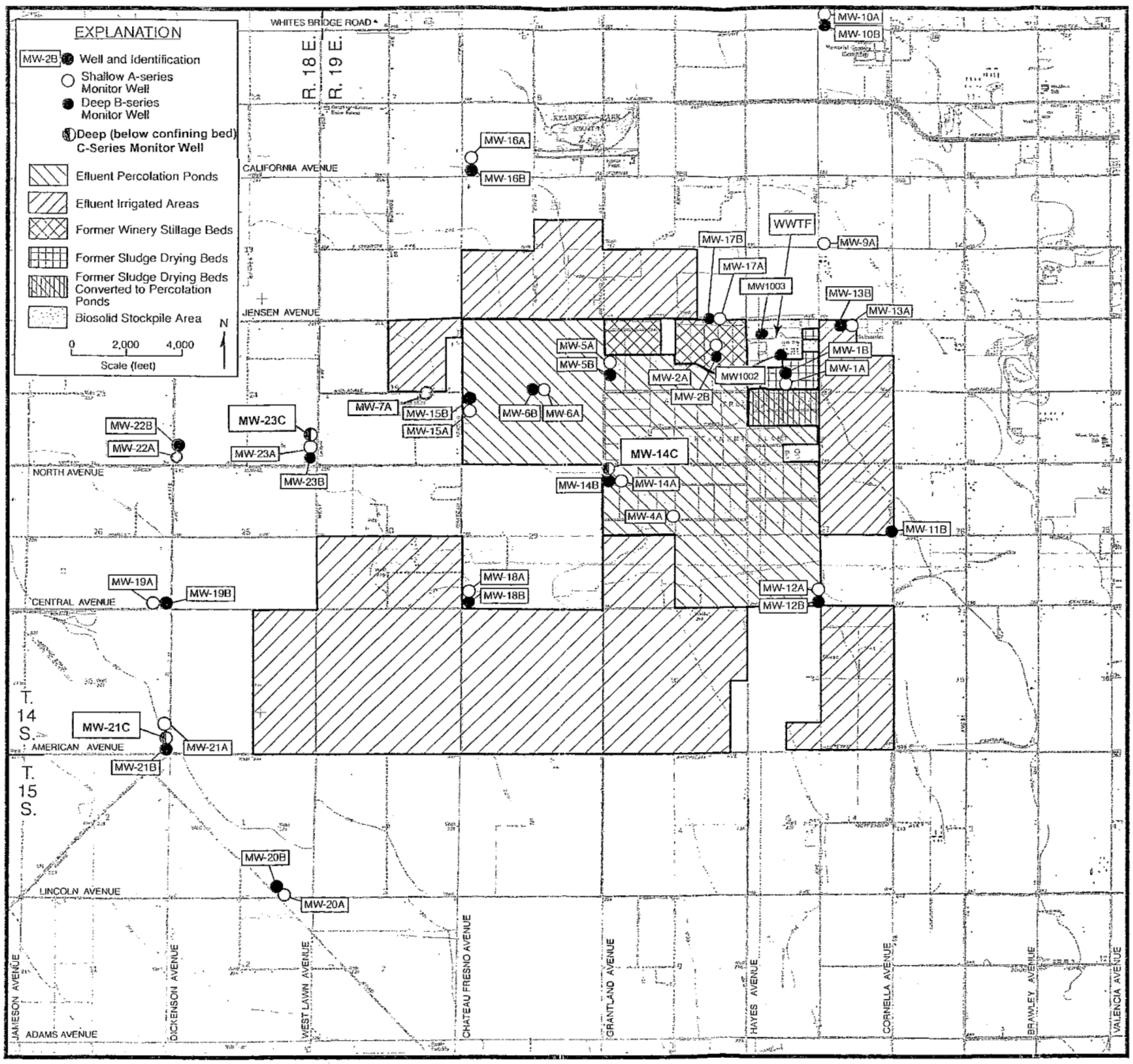


**Figure 16: Fresno-Clovis Metropolitan RWRF Facilities and Monitoring Well Network (taken from Appendix I of the Fresno BPTC Evaluation (Carollo, 2009)).**

Background groundwater EC levels ($C_{GWup}$) were thus derived based on observed concentrations (provided by the City of Fresno) in the two wells furthest up-gradient from the RWRF (MW-10A and MW-10B). Well MW-10A is screened from 74 – 94 ft bgs and is assumed to represent the shallowest groundwater concentrations in layer A (less than 100 ft bgs) whereas MW-10B is screened from 148 – 168 ft bgs and is assumed to represent deeper concentrations in layer B (100 – 275 ft bgs). Based on data from up-gradient wells MW-10A and MW-10B, background groundwater EC concentrations appear to be increasing with time, with strong linear trends evident in both shallow and deep up-gradient wells (see **Figure 17** and **Figure 18**).

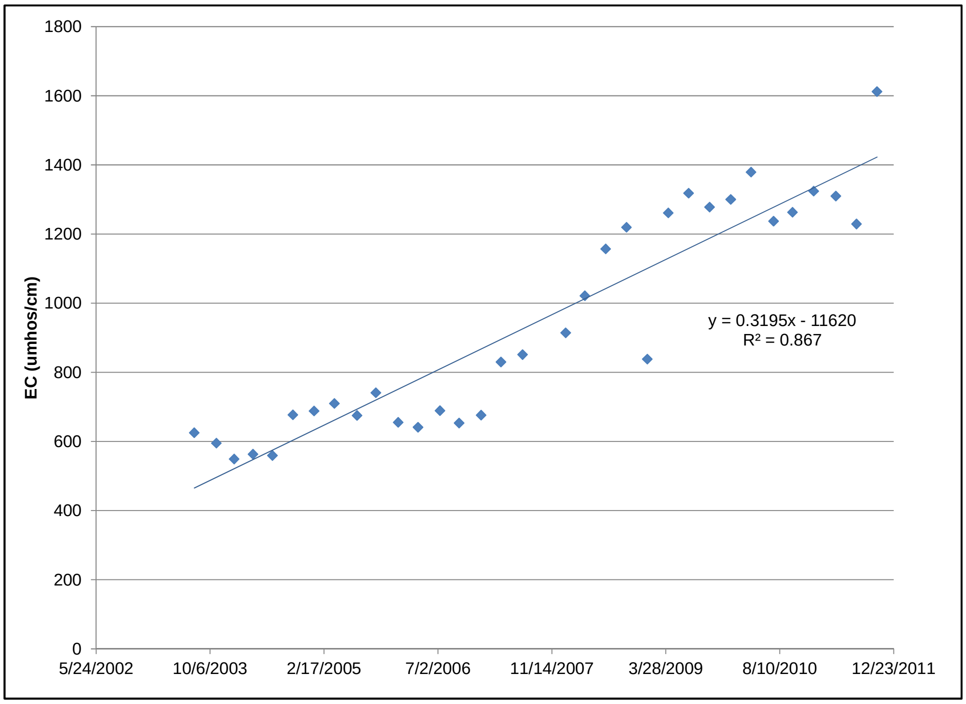


**Figure 17: Layer A (< 100 ft bgs) Up-gradient Groundwater Concentrations, 2003 – 2011 (MW-10A).**

Though groundwater quality in the Layer B up-gradient well (MW-10B) appears to be degrading, current EC concentrations in this well still fall within the low range of typical EC levels of the Kings Groundwater Sub-basin (DWR-Bulletin 118, 2003) and are less than RWRF effluent concentrations. In contrast, shallow up-gradient wells in Layer A (MW-10A) exhibit EC concentrations that are greater than the maximum RWRF effluent concentrations.

The degradation of the up-gradient groundwater quality and the high shallow up-gradient EC concentrations indicate that there are likely additional salinity sources contributing to degradation to overall groundwater quality in the basin. Degradation of background groundwater in the vicinity of the RWRF due to other sources such as nearby irrigated agricultural lands, or existing and past dairy operations, has been documented (Appendix M of the Fresno BPTC Evaluation (Carollo, 2009); Resolution No. R5-2002-0254-A01 Amending WDR Order No. R5-2001-254 for Fresno-Clovis Metropolitan RWRF). Due to the presence of these other salinity sources, the City of Fresno WDR indicates that the RWRF discharge shall not, in combination with other sources of salinity, cause the groundwater down-gradient of the discharge area to exceed an interim groundwater objective (990 µmhos/cm) or the natural background concentration, whichever is greater.

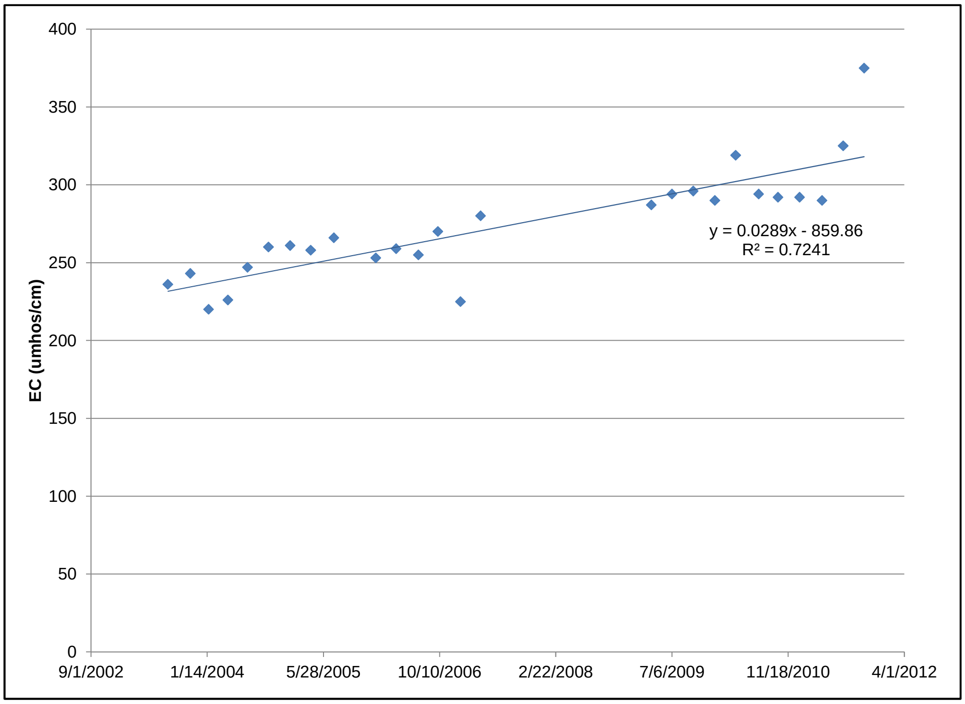


**Figure 18: Layer B (100 – 275 ft bgs) Up-gradient Groundwater Concentrations, 2003 – 2011 (MW-10B).**

For this reason, an approximation of the trend in background concentrations was incorporated into the mixing model. Based on the trend of degradation, the linear regression equations shown in **Figure 17** and **Figure 18** were used to estimate future background groundwater concentrations over the next 10 years. Overall background quality is estimated via a weighted average of concentrations in layers A and B. Background groundwater concentrations for each future one-year mixing period considered in the analysis are provided in **Table 13**. Though it is not known if the degradation rate observed in these two wells is representative of the overall trend of background groundwater degradation in the vicinity of the RWRF, this analysis incorporates the best available information on background quality and allows for evaluation of the impacts of discharge from the RWRF in combination of other sources of salinity in the vicinity.

**Table 13: Projected Background Groundwater EC Concentrations from 2011 through 2021.**

| Time Period | Background EC[1] (µmhos/cm) |
|---|---|
| 1 Year | 566 |
| 2 Year | 600 |
| 3 Year | 635 |
| 4 Year | 669 |
| 5 Year | 703 |
| 6 Year | 737 |
| 7 Year | 771 |
| 8 Year | 806 |
| 9 Year | 840 |
| 10 year | 874 |

Note:
1. Overall background concentrations estimated via a weighted average of concentrations in upper aquifer layers A and B.

## *ii. Results and Analysis*

### *ii.1 Resulting Groundwater Quality Due to RWRF Discharge*

Projected, future, down-gradient groundwater quality assuming partial MF/RO treatment versus projected, future, down-gradient groundwater quality assuming the case-by-case exception is granted is summarized in **Table 14**.

**Table 14: Projected Future Down-gradient Groundwater Quality (1)**

| Time-Period | Projected DG GW Quality with MF/RO Treatment (µmhos/cm)(2) | Projected DG GW Quality if Case-by-Case Exception is Granted (µmhos/cm)(3) | % Increase in DG GW Quality If Case-by-Case Exception is Granted |
|---|---|---|---|
| Year 1 | 699 | 740 | +6% |
| Year 2 | 711 | 751 | +6% |
| Year 3 | 722 | 763 | +6% |
| Year 4 | 734 | 774 | +6% |
| Year 5 | 745 | 786 | +5% |
| Year 6 | 756 | 797 | +5% |
| Year 7 | 768 | 808 | +5% |
| Year 8 | 779 | 820 | +5% |
| Year 9 | 791 | 831 | +5% |
| Year 10 | 802 | 843 | +5% |

Note:
1. Assumes effluent volume of 70 MGD for both scenarios and all mixing periods
2. Assumes that a portion of effluent will be treated with MF/RO to result in average EC effluent concentrations of 766 µmhos/cm for all mixing periods.
3. Assumes no MF/RO treatment; average effluent quality is assumed to be equal to the 5-year average, i.e., 827 µmhos/cm for all mixing periods.

If the case-by case exception is granted, down-gradient groundwater concentrations over the next five years are projected to range between 740 and 786 µmhos/cm. Due to projected degradation in background groundwater (see **Table 13**), concentrations in down-gradient groundwater are expected to increase to 843 µmhos/cm after 10 years. Granting of a case-by-case effluent limit exception is estimated to result in a 5-6% increase in EC concentrations in groundwater down-gradient of the percolation ponds compared to down-gradient groundwater concentrations that are estimated to result from implementation of MF/RO. Note that if the effluent volume were to increase at later times up to the design capacity of 88 MGD, the resulting concentrations for each scenario would differ by less than 1%.

### c. Water Quality Impacts Analysis Conclusions

#### *i. Delta Communities*

Requiring the cities of Tracy, Stockton, and Manteca to meet a final EC effluent limit of 700 µmhos/cm that is contained in each of their NPDES permits would provide little to no reduction in EC concentrations measured in downstream receiving waters. The analyses above show that implementation of RO treatment to remove salts from a portion of a discharger's effluent in order to meet a final EC effluent limit of 700 µmhos/cm would reduce near-field downstream receiving water EC concentrations from 0.31% (City of Manteca WQCF during a critical water year) to 2.66% (City of Tracy WWTP during high Delta exports). With regard to the City of Tracy, the one discharger where far-field water quality impacts were able to be evaluated, the benefit to the receiving water of removing salts from the WWTP effluent rapidly diminishes with distance from the discharge point. Whereas it is estimated that partial RO treatment of Tracy's effluent would result in a small 2.44% (low Delta export condition) to 2.68% (high Delta export condition) lowering in EC levels just downstream of the WWTP outfall, implementation of the same level of RO treatment would only impart a 0.08% (high Delta export condition) to 1.47% (low Delta export condition) decrease in receiving water EC concentrations in Old River at Tracy Road Bridge (a D-1641 salinity compliance station), a location approximately 4.25 miles downstream of the Tracy discharge. The DWR DSM2 model estimates that there would be no change in EC at two other D-1641 salinity compliance locations – Old River at Middle River and San Joaquin River at Brandt Bridge – due to the assumed permanent installation of SDIP salinity control gates that would prevent Tracy WWTP effluent from reaching these far-field locations.

The water quality impacts analyses performed for all three Delta dischargers show that wastewater treatment controls (RO treatment of a portion of a facility's effluent) will only have very limited localized impacts on the reduction of salts in receiving waters and will not act to appreciably lower salts in the south Delta due to the relatively large salinity inputs contributed by the San Joaquin River and the evapoconcentration affect that agricultural practices have on water withdrawn from and returned to the south Delta. Conversely, the granting of a salinity variance for each of the Delta communities would have only have very limited localized impacts on the addition of salts to receiving waters. In effect, the granting of a salinity variance represents a delay in the slight improvement in water quality that would occur with future implementation of RO treatment as a means to comply with a final EC effluent limit of 700 µmhos/cm.

Requiring wastewater treatment plants to provide RO treatment for a portion of their discharge will not achieve the April 1 through August 31 700 µmhos/cm Bay-Delta Plan water quality objective for EC in the south Delta. With regard to the City of Tracy discharge, even full RO treatment of its effluent would not be sufficient to bring ambient EC concentrations in the south Delta into compliance with the 700 µmhos/cm EC objective because the City's contribution to the overall salt load is too small to affect a change in regional EC concentrations. The Stockton RWCF and Manteca WQCF are situated at the periphery of the south Delta and discharge treated effluent to the San Joaquin River at locations where the ambient receiving water EC concentration typically meets the April 1 through August 31 700 µmhos/cm EC objective as a 30-day running average (refer to the average upstream and estimated downstream receiving water EC concentrations for the two facilities listed in **Table 10**. The addition of full RO treatment at these two facilities would have a small positive impact on near-field salt concentrations, but would not affect regional ambient receiving water compliance with the April 1 through August 31 700 µmhos/cm Bay-Delta Plan water quality objective for EC in the south Delta.

Furthermore, as stated in the 2011 USBR report, the effect of minor salinity changes in the interior Delta associated with implementation of a salinity variance for wastewater discharges is not expected to have an effect on San Joaquin River flow requirements impacting the USBR and its users. Salinity levels in the south Delta are largely driven by the salinity of water in the San Joaquin River near Vernalis that flows into the south Delta and the salts contributed by agricultural practices within the region. Point source impacts from wastewater treatment facilities contribute little to the salinity levels measured in the south Delta.

#### *ii. City of Fresno*

Results from the water quality impacts analysis indicate that granting a case-by-case effluent limit exception to the City of Fresno RWRF is not expected to result in significant impacts to groundwater quality. Granting of the case-by-case effluent limit exception is estimated to result in an increase of just 4 – 6% in down-gradient groundwater quality over the baseline scenario, which assumes treatment of a portion of effluent with MF/RO to achieve a final effluent quality for EC of 766 µmhos/cm.

## VI. 40 CFR 131.10(G) ANALYSIS

### a. 40 CFR 131.10(g) Background

To gain approval for a water quality standards variance for a discharge to surface waters, USEPA guidance states that a showing should be made that the variance is consistent with 40 CFR 131.10(g).

The 40 CFR 131.10(g) analysis contained herein considers three Central Valley NPDES permittees as case studies. The City of Tracy WWTP, the City of Stockton RWCF, and the City of Manteca WQCF all discharge treated effluent to the Sacramento-San Joaquin Delta and are all subject to NPDES permit waste discharge requirements as promulgated by the Central Valley Water Board, including final effluent limitations for EC derived from water quality objectives contained in the Bay-Delta Plan.[5] These NPDES permittees cannot consistently meet these EC (salinity) limitations. All three facilities have implemented significant salinity source control efforts, including obtaining additional surface water supplies and/or requiring industrial source control and pretreatment, which have resulted in decreases in effluent EC concentrations over time as compared to historic levels. However, as described in this memorandum, these efforts are not projected to be adequate to result in consistent compliance with final effluent limitations for EC for any of the three communities.

United States Environmental Protection Agency (USEPA) guidance indicates that a water quality standards variance has been and can be used to provide a mechanism by which NPDES permits can be written where discharger compliance with the effluent limits derived from underlying water quality standards is demonstrated to be infeasible at the present time within the meaning of 40 CFR 131.10(g). For NPDES permittees, USEPA guidance notes that a variance provides a "bridge" if additional data or analysis is needed before the state or tribe can make a determination whether the designated use or water quality standard is not attainable and should be modified (U.S. EPA, 1994). A variance can also provide a mechanism that bridges the gap between time schedules allowed under state laws and compliance schedules allowed under federal laws.

To make the case for a variance, USEPA guidance indicates that a demonstration is needed that compliance with effluent limits derived from water quality standards is infeasible due to at least one of the following six factors:

> Sec. 131.10 Designation of uses. [ . . . ] (g) States may remove a designated use which is not an existing use, as defined in Sec. 131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:
>
> (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
>
> (2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent

[5] 700 µmhos/cm from April 1 to August 31 and 1,000 µmhos/cm from September 1 to March 31, as a monthly average

discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact. (40 CFR 131.10(g))

This analysis addresses two of the above six factors for the case study communities. Those are the third factor ((40 CFR 131.10(g)(4)), i.e., that human caused conditions prevent the attainment of the use and cannot be remedied by actions by the case study communities, and the sixth factor ((40 CFR 131.10(g)(6)), i.e., controls more stringent that otherwise required under the Clean Water Act by the case study communities would result in substantial and widespread economic and social impact.

## b. Approach to Analysis

Each of the two 40 CFR 131.10(g) factors addressed in the current salinity variance analysis require an individual examination to demonstrate that compliance with effluent limits derived from water quality standards is infeasible for the three Delta communities. The Factor 3 analysis requires an explanation as to why human caused conditions prevent the attainment of the use (via non-compliance with water quality standards), whereas the Factor 6 analysis requires a demonstration that compliance with water quality standards would result in substantial and widespread economic and social impacts in a community. The Factor 6 analysis requires use of USEPA economic guidance to make the substantial and widespread determination.

USEPA developed and periodically updates guidance on how to determine if the capital and operations and maintenance (O&M) costs of pollution control will have a substantial and widespread economic impact on a community (U.S. EPA, 1995). The 1995 *Interim Economic Guidance for Water Quality Standards – Workbook* (USEPA Economic Guidance) was used in the Factor 6 analysis as a means to consider the cost of implementing RO treatment at the three Delta wastewater treatment facilities under study and estimating the change in socioeconomic conditions in a community that would occur as a result of implementing RO treatment of a portion of a dischargers effluent for the purpose of complying with a final EC effluent limit of 700 µmhos/cm.

The USEPA Economic Guidance describes a series of steps and decision points in a process that leads to the demonstration of substantial and widespread socioeconomic impacts related to implementation of pollution controls necessary to meet water quality standards. The five steps in the USEPA Economic Guidance process used to determine the magnitude of socioeconomic impacts on a community include the following:

- Calculate the annual cost of pollution control
- Calculate total annual pollution control costs per household
- Calculate and evaluate the Municipal Preliminary Screener Score
- Apply the Secondary Test
- Assess where the community falls in the Substantial Impacts Matrix

## c. 40 CFR 131.10(g)(3) (Factor 3) Analysis

The third of the six factors to be considered under 40 CFR 131.10(g) is:

> "Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place"

For the analysis of the third factor under 40 CFR 131.10(g), key questions are (1) whether conditions preventing the attainment of the South Delta agricultural use are human caused, (2) whether those conditions can be remedied to achieve South Delta objectives, and, similarly, (3) whether, as a result of implementing measures to attain water quality-based effluent limits, the South Delta water quality objectives will be attained.

It is acknowledged that various human caused conditions, i.e. the diking of the Delta for agriculture and for development, the modification of flows to the Delta through construction of dams and diversions, construction and operation of the Central Valley Project (CVP) and State Water Project (SWP), agricultural return flows to the Delta, and municipal discharges, all have contributed to the existing salinity condition in the South Delta, to greater or lesser degrees.

### *i. Background to Factor 3 Analysis*

In assessing the past efforts to achieve compliance with water quality objectives for salinity (EC) in the south Delta to protect designated agricultural uses, the following historical background (Kyler, 2011a; Kyler, 2011b) is important.

During a twelve year period from 1958 to 1970, the SWRCB adopted six decisions approving permits for various components of the federal CVP operated by the US Bureau of Reclamation. In those approvals, the State Water Board reserved jurisdiction to revisit water quality requirements, including salinity requirements, in future actions. In 1967, the State Water Board adopted decision D-1275, approving permits for the Department of Water Resources to operate the SWP and conditioning the permits on meeting agricultural salinity standards at several Delta locations. In 1973, the State Water Board (in decision D-1422) approved permits for USBR's New Melones Reservoir on the Stanislaus River. The State Board conditioned the permits on meeting total dissolved solids of 833 µmhos/cm EC at Vernalis on the San Joaquin River.

In 1978, the State Water Board approved decision D-1485, the water quality control plan for the San Francisco Bay/Sacramento-San Joaquin Delta estuary. In that plan, the State Board established the agricultural salinity objectives that are currently in effect in the south Delta. The belief at the time of adoption of the plan was that the construction of physical facilities to provide adequate circulation and substitute supplies would be the practical solution for achievement of south Delta EC objectives. In 1991, the State Water Board adopted a water quality control plan for salinity for the Bay-Delta which established a staged implementation for attainment of the south Delta salinity objectives. The implementation plan acknowledged ongoing negotiations between DWR, USBR and the South Delta Water Agency.

In the period 1995 to 1998, the State Water Board amended the Water Rights permits for DWR and USBR for the SWP and CVP, respectively. The State Water Board required USBR to release water from New Melones Reservoir to comply with the EC objectives at Vernalis. In 2000, the State Board adopted decision D-1641 in which it assigned sole responsibility for meeting the Vernalis EC objectives to USBR and assigned joint responsibility to USBR and DWR to meet the EC objectives at three interior Delta locations. In 2006, the State Water Board adopted the current version of the Bay-Delta Plan, making minimal changes to the salinity provisions of the 1995 Bay-Delta Plan. The State Water Board committed to begin a process to evaluate San Joaquin River flow and south Delta salinity objectives as part of its ongoing process to revise the Bay-Delta Plan.

In October 2011, the State Board released a Technical Report on the Scientific Basis for Alternative San Joaquin River Flow Objectives for the Protection of Fish and Wildlife Beneficial Uses and Water Quality Objectives for the Protection of Southern Delta Agricultural Beneficial Uses and the Program of Implementation for those Objectives for independent peer review (CSWRCB, 2011).

Key facts regarding attainment of the south Delta agricultural objectives for EC are as follows:

(1) The EC water quality objectives for the interior south Delta locations have not been consistently achieved since 1978, when the first version of the objectives was adopted (CSWRCB, 2011).
(2) The State Water Board and other parties have repeatedly acknowledged that the management measures to attain the south Delta EC objectives are a combination of (a) flow releases into the San Joaquin River to attain objectives at Vernalis, (b) installation of physical facilities (pumps and barriers) in the south Delta, and (c) operation of the SWP and CVP projects (CSWRCB, 2011).
(3) The feasibility of attaining the south Delta EC objectives has been the subject of ongoing study and negotiation for over three decades. An April 2011 feasibility study by the USBR addressed this question and concluded that the attainment of EC objectives at interior south Delta locations through increased dilution flows in the San Joaquin River would require an unreasonable, and likely unavailable, volume of water (USBR, 2011). The April 2011 report also showed that USBR has established a consistent record of complying with the EC objectives at Vernalis.
(4) Recent studies sponsored by the State Water Board, including a 2010 report by Hoffman (Hoffman, 2010), indicate that higher salinity objectives than the existing objectives could still be protective of agricultural beneficial uses.
(5) Recent studies by the State Water Board and the USBR indicate that municipal wastewater effluent discharges in the Delta constitute a small percentage of the salt load entering from upstream. A 2007 stakeholder study of the City of Tracy discharge conducted by the Department of Water Resources, the Central Valley Water Board, and

the City of Tracy, concluded that the City's discharge has limited impacts on the salinity problem in the southern Delta (DWR, 2007).

In addition to the above, a major planning effort, the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) must be recognized. CV-SALTS is a strategic initiative to address problems with salinity and nitrates in the groundwater and surface waters of the Central Valley by developing a long-term management plan. See **Appendix A** for a detailed description and summary of the CV SALTS Initiative. CV-SALTS is expected to include regulatory approaches that result in requirements for salinity and nitrates which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities and others. Ultimately, CV-SALTS will determine management strategies for important sources to protect and maintain water quality in the Central Valley. The need exists to set current permit limits at a level that protects water quality but that does not compel the irretrievable commitment of major resources in advance of completion of the CV-SALTS plan.

CV-SALTS is examining various regulatory modifications to be included in a Basin Plan amendment, including establishment of appropriate designated uses in some water bodies and modifications of water quality objectives in other water bodies. CV-SALTS is currently modifying its five-year work plan (CV-SALTS, 2012c) to include such actions. The timing for completion of possible changes in water quality objectives or in salinity management strategies will be 2016, at the earliest.

With both the Basin Plan and Bay-Delta Plan salinity objectives in a state of potential flux, the current effluent limits in NPDES permits for the three communities in question are similarly in flux. If objectives are relaxed from the current levels, the effluent limits would change to reflect those modifications. A plausible future outcome is that changes in water quality objectives and implementation of salinity control activities by dischargers would result in effluent limits that do not require additional salt-specific treatment at a wastewater treatment facility.

#### *ii. Factor 3 Analysis*

As described in the Background section above, efforts to achieve the EC objectives originally established in 1978 and refined in 1995 and 2000 have been intensively examined, but have not yielded a clear solution. Those efforts have focused primarily on flow control in the San Joaquin River at Vernalis as a means to achieve the objectives.

Recent studies (the April 2011 study by USBR and the October 2011 study by the State Water Board) indicate that attainment of the south Delta EC objectives through flow control is not feasible, and that attainment of the existing objectives is likely not required to attain the desired use (i.e. 100 percent yield of salt tolerant crops (dry beans and alfalfa) during essentially all conditions).

An emerging consensus is that the control of wastewater discharges will have little impact on the attainment of south Delta EC objectives, given the small contribution of those discharges to the overall salt loading. The October 2011 State Water Board report supports this consensus.

## d. 40 CFR 131.10(g)(6) (Factor 6) Analysis

Under 40 CFR 131.10(g), one of the six factors that can form the basis for USEPA approval of a variance (Factor No. 6) is if "controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact." Sections 301(b) and 306 of the Clean Water Act impose specific technology-based requirements (e.g., the requirement of secondary treatment for all publicly owned treatment works (POTW)). In essence, this factor describes water quality-based requirements that go beyond the federal secondary requirement. The water quality-based effluent limits for EC represent controls more stringent than secondary treatment.

The following analysis addresses the economic and social impacts of constructing and operating treatment facilities to meet the effluent limits derived from south Delta EC standards. As a preliminary step, the treatment requirements and cost of treatment will be determined. Information is provided in this memorandum that demonstrates that reverse osmosis treatment of a portion of each discharge is the only remaining means to achieve compliance with effluent limits for salinity. Each of the communities in question has already implemented significant steps to control salinity through pollution prevention, source control, and water supply changes.

The approach utilizes information contained in the 1995 USEPA *Interim Economic Guidance for Water Quality Standards* as a basis for the analysis (U.S. EPA, 1995). First, the costs of achieving compliance with existing effluent limits derived from current south Delta EC objectives will be established. The primary screening tool described in the USEPA Economic Guidance document – the Municipal Preliminary Screener – will then be used to assess the affordability of new treatment facilities required to meet water quality-based effluent limits for salinity in the Delta. The outcome of the Municipal Preliminary Screener analysis will be used to determine whether the new treatment costs are substantial in lieu of performing the Secondary Test described in the guidance document. Next, an evaluation will be made of local socioeconomic factors to assess the widespread nature of the economic impact. Finally, as allowed under USEPA guidance, the environmental benefit associated with the construction and operation of the new treatment facilities (e.g. changes in ambient water quality and impact on beneficial uses) will be evaluated. This information will be used, in aggregate, to assess whether existing water quality objectives would be attained in the south Delta and whether near-term economic investment in RO treatment by the local communities is warranted.

### *i. Cost of Achieving Effluent Limits*

If the affected NPDES permittees are required to meet effluent limits derived from south Delta EC objectives, the engineering evaluations presented in Section V of this memorandum indicate that RO systems will be needed to treat a portion of each facility's effluent RO treatment technology allows for the consistent removal of inorganic molecules and ions, such as salts and trace minerals, from wastewater that has already been treated using the existing facility processes. A portion of the total effluent flow for each community would be treated using RO and blended with non-RO-treated effluent to reduce the overall salinity of the effluent and thereby meet the specified limit(s). The RO process creates concentrated brine waste (at a magnitude of 15 to 20 percent of the total volume of effluent flow treated) that may require additional treatment prior to disposal. Microfiltration (MF) prior to RO was not considered in the current cost estimates for the Delta surface water dischargers (Tracy, Stockton, Manteca) because existing treatment processes at each of the three subject facilities includes filtration.

Planning level estimates of the capital and O&M costs associated with implementation of RO treatment to meet the more stringent 700 µmhos/cm effluent limit (April 1 – August 31) for electrical conductivity for the three affected NPDES permittees are provided in **Table 15**.

**Table 15: Planning Level Cost Estimates for Reverse Osmosis (RO) Treatment.**

| Discharger | RO Treatment (MGD) required to meet 700 µmhos/cm EC Limit[1] | Cost ($ Million) Capital[2,3] | Annualized Capital[4] | Annual O&M[2] | Total Annual[5] | Present Worth[6,7] |
|---|---|---|---|---|---|---|
| City of Tracy | 11.9 | 67.0 | 4.5 | 6.6 | 11.1 | 166 |
| City of Stockton | 37.5 | 211 | 14.1 | 20.9 | 35.0 | 523 |
| City of Manteca | 7.1 | 40.0 | 2.7 | 3.9 | 6.6 | 99 |

Notes:

1. Effluent flow requiring RO treatment to meet a 700 µmhos/cm EC effluent limitation using a 25% safety factor to address the range of influent EC concentrations observed for the facility.
2. Capital and O&M costs developed using: Memorandum: Modification of Flow Basis for Treatment Train Costs as Previously Presented in the "Advanced Treatment Alternatives for the Sacramento Regional Wastewater Treatment Plant" (Carollo, March 2009). (Carollo, 2010)
3. Treatment costs include engineering, administrative, legal, and contingency. All costs in June 2012 dollars (ENRCCI 9838). The ENRCCI for Sacramento, CA (9838) was estimated by taking the average ENRCCI for the U.S. 20 Cities (i.e., 20-City Average) and the ENRCCI for San Francisco, CA.
4. Annualized capital costs developed using a 30-year amortization period and 5.25 percent interest rate.
5. Total Annual Cost = Annualized Capital Cost + Annual O&M Cost.
6. Present worth represents the summation of the capital construction cost plus the capitalized annual operation and maintenance cost based on a 30-year planning period and 5.25 percent interest rate.
7. Due to the recent bankruptcy of the City of Stockton, it may not be able to receive an interest rate as low as 5.25 percent, and therefore the actual cost of implementing RO treatment may be greater than shown in the above table.

Construction and operation of RO facilities would require a significant amount of capital and long-term O&M costs; the actual cost to each facility will vary depending on the portion of the total flow requiring treatment in order to meet the final effluent limit(s) for salinity. Estimated construction capital costs range from $40 to $211 million, and estimated O&M costs range from $3.9 to $20.9 million. Estimated total annual costs range from $6.6 to $35 million, and present worth values for construction and operation of RO facilities range from $99 to $523 million.

The operation of RO treatment systems would also significantly increase the energy demand for each facility, requiring potentially greater power distribution system capacity, back-up power generating capacity, and/or power grid connection capacity (West Yost Associates, 2011).[6] RO is an extremely energy-intensive process, and increased energy demand would result in a subsequent expansion of greenhouse gas emissions and the carbon footprint of each facility. A summary of the potential increased carbon footprint associated with the operation of RO treatment systems is included in **Table 16**. The greenhouse gas emission estimates provided in **Table 16** are in addition to those emissions currently generated by each facility.

Brine disposal alternatives include crystallization and land disposal, evaporation/containment ponds, piping or trucking liquid brine for off-site disposal, or deep-well injection. For

[6] The cost of expanding local/regional electricity infrastructure due to increased energy demand from a wastewater treatment plant is not considered in the RO treatment cost estimates provided in **Table 15** because the cost of infrastructure expansion would typically be assumed by the power provider and offset by utility rate increases.

communities in the Central Valley, which are located significant distances from the ocean or other suitable disposal sites, liquid brine transport is not cost-effective. The volumes of brine generated at the community level are problematic for deep-well injection. The most viable alternatives are crystallization and disposal (a high energy process) and use of evaporation/containment ponds (a land-intensive option), each of which represent an irretrievable commitment of resources. The RO treatment costs provided in **Table 15** include the cost of thermal brine concentration, crystallization, and land disposal.

**Table 16. Additional Greenhouse Gas Emission Associated with the Operation of RO Treatment Systems.**

| Discharger | Effluent Treated with RO (MGD) | Estimated Daily Electricity Usage for RO Treatment (kWh)[1] | Estimated Daily $CO_2$ Emissions (lbs)[2] per kWh Consumed | Estimated Daily $CO_2$ Emissions (metric tons) | Estimated Annual $CO_2$ Emissions (metric tons) |
|---|---|---|---|---|---|
| City of Tracy | 11.9 | 130,900 | 106,029 | 48.1 | 17,554 |
| City of Stockton | 37.5 | 412,500 | 334,125 | 151.6 | 55,318 |
| City of Manteca | 7.1 | 78,100 | 66,064 | 30.0 | 10,938 |

Notes:
1. Daily power usage based on estimate of 11,000 kWh consumed per million gallons treated with RO (Carollo, 2007).
2. CO2 emissions based on 0.81 lbs of CO2 produced per kWh of electricity consumed (CCAR, 2007).

### *ii. Affordability Analysis of Achieving Effluent Limits*

Once new pollution control costs are estimated for a community, EPA Economic Guidance requires the performance of a preliminary test to determine the affordability of these pollution controls costs to a community to quickly identify costs that are not likely to cause substantial financial impacts to the community. This preliminary test is used to calculate a value called the Municipal Preliminary Screener (MPS). The MPS is calculated by dividing the average total pollution control cost per household by the median household income within a community. The total average pollution control cost per household includes the cost of *existing* wastewater and stormwater control plus the cost of *future* wastewater control due to implementation of additional pollution control measures (i.e., RO treatment to meet final effluent limit for EC). These costs, other pertinent information, and MPS values are provided in **Table 17** for each of the three Delta dischargers.

**Table 17: Municipal Preliminary Screener Values Calculated for Delta Dischargers.**

| Discharger | Current Monthly Sewer Fee | Planning Level Estimated Monthly RO Treatment Fee[(1)] | Monthly Stormwater Control Fee | Avg Annual Total Pollution Control Cost Per Household | Median Household Income[(2)] | Municipal Preliminary Screener |
|---|---|---|---|---|---|---|
| City of Tracy | $34.10[(3)] | $29.77 | $1.20 | $780.85 | $67,105 | 1.164 |
| City of Stockton | $40.67[(3)] | $17.50 | $2.10 | $723.21 | $44,310 | 1.632 |
| City of Manteca | $43.30 | $8.83 | --- | $625.51 | $53,037 | 1.179 |

Notes:

1. Fee based on portion of total RO treatment costs to be paid by residential ratepayers.
2. MHI taken from U.S. Census Bureau, 2011 American Community Survey. Available online at American Fact Finder: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.
3. Current monthly sewer fee includes scheduled near-term fee increase.

EPA Economic Guidance provides three thresholds by which to compare the calculated MPS value: a value less than 1, a value between 1 and 2, and a value greater than 2. A MPS value of less than 1 is interpreted as representing new pollution control costs that will not cause a substantial economic hardship on households in a community. A MPS value between 1 and 2 is interpreted as representing new pollution control costs that are expected to produce mid-range economic impacts on households in the community. Finally, a MPS value greater than 2 is interpreted as representing new pollution control costs that may place an unreasonable financial burden on many of the households within the community. As shown in **Table 17**, the MPS values calculated for the three Delta dischargers are all greater than 1 and indicate that the cost of adding RO treatment to these facilities would produce mid-range economic impacts within each community. The MPS value calculated for each community was used to make a determination that the cost of RO treatment would produce substantial economic hardship to ratepayers in each community in light of existing economic conditions in each city, and more generally, in San Joaquin County and the Central Valley. The current analysis did not employ the Secondary Test for determination of substantial impacts provided in the EPA Economic Guidance. A discussion of current economic conditions in the subject cities and the interrelatedness of their economies is provided in the following subsection.

An important set of numbers presented in **Table 17** is the planning level costs of RO treatment estimated for each city. These monthly RO treatment fees – or salinity reduction costs – range from $8.83 for households in the City of Manteca to $29.77 for households in the City of Tracy. These costs signify *de facto* decreases in the disposable personal income (DPI) available to each household in a community. DPI represents “after tax” income and is available to households for spending and saving. A loss in DPI can affect the health of local and regional economies due to the something called the economic multiplier effect. Multipliers describe the response of an economy to a stimulus that produces an increase (positive stimulus) or decrease (negative stimulus) in demand or production. Every time there is either an injection or removal of demand into the circular flow of commerce within or between economies there is likely to be a multiplier effect. This is because an increase or decrease in spending leads to an increase or decrease in incomes within an economy, whether the spending occurs at the corporate, small business, institutional, or individual levels.

### *iii. Economic Impacts of Achieving Effluent Limits*

The determination that the cost to the three Delta communities to implement RO treatment to meet final EC limits would impose substantial economic impacts on the households in each of the three cities is based on the MPS values calculated for each community, as well as the current economic conditions endured by each city. The Central Valley, which includes San Joaquin County, and within it the cities of Tracy, Stockton, and Manteca, has been one of the hardest hit regions in the State by the *Great Recession*. While official measures define the recession as lasting from December 2007 until June 2009, the Central Valley's economy has struggled well past the technical end date of the economic downturn and continues to lag behind the economies of other regions in the State (PPIC, 2011). **Table 18** presents labor market information for the three Delta communities, San Joaquin County, and California for the month of June 2012. The unemployment rates for Stockton, Manteca, and San Joaquin County exceed the State average of 10.7%. Only the City of Tracy has an unemployment rate less that the State's average.

The Central Valley, along with the Central Coast region, had the highest percentage of families with low incomes before the recession, and continues to maintain this distinction post-recession. Median household income fell 15.6% in the Central Valley from 2006 to 2010 compared to a 10.4% decrease experienced statewide (PPIC, 2011). The depressed economies of Central Valley cities and the associated decreases in household incomes have forced municipal governments to reduce services, while at the same time increase the cost to ratepayers of the services still offered. A prolonged fiscal crisis prompted the City of Stockton to file for bankruptcy on June 28, 2012, as a means to seek protection from its creditors and restructure its debt. The present economic conditions experienced by the residents of the cities of Tracy, Stockton, and Manteca would only be exacerbated by an increase in the total pollution control costs paid by households if these costs were increased to pay for RO treatment. Under these current depressed economic conditions, the financial impact to households required to pay for RO treatment would be substantial.

**Table 18: Unemployment Rates for Select Central Valley Cities and San Joaquin County – June 2012**

| Area | Labor Force | Unemployment | Unemployment Rate (%) |
|---|---|---|---|
| City of Tracy | 33,900 | 3,100 | 9.3 |
| City of Stockton | 129,900 | 23,200 | 17.9 |
| City of Manteca | 28,400 | 3,700 | 12.9 |
| San Joaquin County | 308,300 | 45,700 | 14.8 |
| California | 18,444,600 | 1,972,400 | 10.7 |

Notes:

All data in above table taken from Employment Development Department Labor Market Information web site (http://www.labormarketinfo.edd.ca.gov./), State of California.

The substantial economic impacts that would be endured by cities required to implement RO treatment would also exist as widespread economic impacts due to the interrelated nature of the economies of Central Valley cities. The economic multiplier effect discussed above exists within a local economy and between economies, whether they are at the city, county, or regional level. A decrease in DPI due to increased pollution control costs results in a decrease in spending on goods and services, which results in a decrease in demand for goods and services. A decrease in demand affects employment as fewer workers are needed to meet the decreased demand. A loss or reduction in employment at the household level translates into a further reduction in DPI. A loss, whether in dollars or jobs, is linked to a reduction in DPI due to an increased sewer fee required to pay for RO treatment. All communities possess somewhat unique spending habits as a whole, and a reduction in DPI has different consequences for some economic sectors[7] as compared to others depending on the community in which the reduction in DPI occurs. A substantial economic impact becomes a widespread economic impact when the multiplier or ripple effect of decreased spending occurs within or between economies. Compliance with a final EC effluent limit of 700 µmhos/cm for the cities of Tracy, Stockton, and Manteca would affect economic conditions with each city and would affect the flow of goods and services between these cities and other cities in the Central Valley. For these reasons, the additional pollution control costs and economic impacts associated with RO treatment would be both substantial and widespread for the affected Delta communities.

### *iv. Factor 6 Analysis*

In **Section V** of this memorandum, an analysis is performed to examine the water quality impacts of improved effluent quality by the cities of Tracy, Stockton, and Manteca (i.e. resulting from RO treatment to achieve the effluent limits derived from the existing south Delta salinity objective of 700 µmhos/cm). That analysis demonstrated that those water quality impacts are minor. This outcome is consistent with the 2007 stakeholder study by DWR, Central Valley Water Board, and City of Tracy which determined that the City of Tracy discharge has limited impact on south Delta salinity levels (DWR, 2007). This outcome is also consistent with the findings of a February 2012 report by the State Water Board, which found that wastewater effluent discharges in the south Delta composed only a small percentage of the salts loads that entered the south Delta, and therefore, would not be expected to have a significant impact on ambient salinity levels, if reduced (CSWRCB, 2012).

As shown in **Figure 7** through **Figure 13**, the water quality "benefit" of meeting the existing effluent limits for EC is relatively small in each of the three case examples. The incremental changes shown in these figures are arguably at a level that would not be measured in ongoing EC monitoring in the Delta and would therefore not have an effect on water releases from upstream reservoirs or in Delta export operations, each of which rely on EC measurements in the Delta.

The construction of RO facilities to treat a portion of the effluent flow in each community will result in improved effluent quality in terms of the concentrations of other constituents in the effluent. However, it must be noted that such reductions are not otherwise required under the NPDES permits for each community, and that the benefits associated with the reductions that would occur are not obvious since a receiving water meeting a salinity standard before implementation of RO treatment by a POTW would continue to meet the salinity standard after RO treatment and a water body not meeting a salinity standard before RO treatment would still not meet the salinity standard after RO treatment.

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[7] A sector represents an economic activity that produces goods and/or services. Fruit farming, natural gas distribution, real estate, food service, and medical practices, to name a few, all represent economic activities, and hence sectors in an economy.

In the sections above, information is provided pertaining to (a) the uncertainty of water quality objectives that form the basis for current effluent limitations in NPDES permits and the historical difficulty in meeting those objectives through non-NPDES measures, (b) the incremental ambient water quality changes associated with compliance with those limits for three Central Valley communities, and (c) the resource commitment (i.e., cost, energy, carbon footprint) associated with the RO treatment needed to comply with current effluent limits. In reaching a determination of whether granting a variance would avoid substantial and widespread economic and social impacts, clearly the information in (c) is fundamental. The information provided in (a) and (b) provides context for determining the overall benefit of complying with existing effluent limits.

The "substantial" aspect of the determination relates to the costs (which translate to increased rates to residents of the three communities, and associated socioeconomic impacts of reduced DPI or discretionary income), energy consumption, greenhouse gas emission increases, and potential additional environmental and socioeconomic impacts associated with brine disposal activities. As shown in **Table 15**, the capital and annual costs of the RO facilities needed to comply with existing effluent limits for EC are substantial in each of the three communities that have been evaluated.

The "widespread" aspect of the determination relates to regional and population-level effects of the economic impact. The three example communities considered in the analysis represent a significant portion of the urban development area in the Delta, both in terms of areal extent and population. This regional economic impact is reasonably judged to be widespread due to the size and interconnectedness of these local economies within San Joaquin County. It is likely that other smaller Delta communities (e.g., Mountain House Community Services District, Ironhouse Sanitary District, and the City of Rio Vista) would also deem it appropriate to request approval of a variance to avoid RO treatment requirements. Requiring other communities to implement RO treatment of a portion of their effluent to meet effluent limits for EC would only add to the "widespread" nature of the impact.

### e. 40 CFR 131.10(g) Conclusions

As detailed above, the proposed variance from EC water quality standards is justified under 40 CFR 131.10(g)(3), given the uncertainty of future water quality standards for salinity (i.e., the need for effluent quality improvements) and the inability of the three case study communities to affect attainment of either current or future salinity standards in the south Delta. The three case studies are also useful in supporting a finding that 40 CFR 131.10(g)(6) requirements are fulfilled, given the high capital and O&M costs and energy usage associated with the requisite RO treatment facilities to comply with existing effluent limits for EC, the economic impacts of such added Clean Water Act costs on the case study communities, and the small water quality improvements that would result from RO treatment. The additional pollution control costs for providing RO treatment by the subject communities would cause substantial and widespread economic impacts within each community and within the regional economy.

The case studies are also useful in demonstrating that similar conclusions would be reached for other Central Valley communities, and that a variance from EC water quality standards over the next five to ten years would be appropriate for those dischargers.

## VII. ANTIDEGRADATION ANALYSIS

The Clean Water Act, the Bay-Delta Plan, the Sacramento-San Joaquin Basin Plan, and the Tulare Lake Basin Plan require that actions taken that affect water quality comply with federal and State antidegradation policies. In taking the action of establishing a variance policy and implementing an interim salinity program in the Central Valley, including case-by-case exceptions to effluent limits in WDRs, consistency with these policies must be ensured. An assessment of consistency with federal and State antidegradation policies is provided in this section using the case examples for the three Delta communities (Tracy, Stockton, and Manteca) to assess the effect of implementing the EC water quality standards variance and using the City of Fresno to assess the effects of implementing a case-by-case exception to the Tulare Basin Plan effluent limit provision.

### a. Federal Antidegradation Policy and Guidance

The federal Clean Water Act (CWA) requires states to adopt, with United States Environmental Protection Agency (U.S. EPA) approval, water quality standards applicable to all intrastate waters (33 U.S.C. § 1313). U.S. EPA regulations also require state water quality standard submittals to include an antidegradation policy to protect beneficial uses and prevent further degradation of high quality waters (33 U.S.C. § 1313(d)(4)(B); 40 C.F.R. § 131.12). In general, the federal antidegradation policy emphasizes the maintenance of existing ambient conditions. The federal antidegradation policy considers lowering of water quality to be allowable in some cases, including those where the costs of control would cause widespread and substantial economic and social impacts.

The federal antidegradation policy is designed to protect existing uses and the level of water quality necessary to protect existing uses, and provide protection for higher quality and outstanding national water resources. The federal policy directs states to adopt a statewide policy that includes the following primary provisions.

(1) Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after the full satisfaction of the intergovernmental coordination and public participation provisions of the State’s continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control

(3) Where high quality waters constitute an outstanding National resource, such as water of National and State parks and wildlife refuges and waters

of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with Section 316 of the Act. (40 C.F.R. § 131.12)

Based on guidance developed by U.S. EPA, Region 9 (*Guidance on Implementing the Antidegradation Provisions of 40 C.F.R. § 131.12* (U.S. EPA, 1987) and guidance issued by the State Water Resources Control Board (SWRCB or State Water Board) with regard to application of the Federal Antidegradation Policy (Memorandum from William R. Attwater to Regional Board Executive Officers *Federal Antidegradation Policy* (Attwater, 1987)) application of the federal antidegradation policy is triggered by a lowering, or potential lowering, of surface water quality. Because the salinity variance may potentially lower surface water quality, the federal antidegradation policy applies.

The Sacramento River, the San Joaquin River, Tulare Lake, and the San Francisco Bay/Sacramento-San Joaquin Delta Estuary are not designated outstanding natural resource waters; therefore, the receiving waters are not subject to that portion of the federal policy. The application to other portions of the policy is determined on a constituent-by-constituent basis. For water bodies that do not presently attain water quality standards, permitted discharges must maintain existing water quality.

For waters with water quality that is better than necessary to support beneficial uses, a permitted discharge may not lower water quality unless such lowering is necessary to accommodate important economic or social development. In August 2005, U.S. EPA issued a memorandum discussing antidegradation reviews and significance thresholds (Memorandum from Ephraim S. King, Director, Office of Science and Technology, U.S. EPA, Office of Water to Water Management Division Directors, Regions 1-10 (King, 2005). As discussed in the memorandum, an intent of the policy "is to maintain and protect high quality waters and not to allow for any degradation beyond a *de minimis* level without having made a demonstration, with opportunity for public input, that such lowering is necessary and important" (King, 2005). U.S. EPA has determined that the significance threshold of a 10% reduction in available assimilative capacity is "workable and protective in identifying those significant lowering of water quality that should receive a full . . . antidegradation review, including public participation" (King, 2005). This determination by U.S. EPA is helpful in establishing the magnitude of water quality change that is considered to be of significant interest in the antidegradation analysis.

### b. State Antidegradation Policy and Guidance

The State's antidegradation policy is embodied in SWRCB Resolution 68-16. In general, the State's antidegradation policy emphasizes the protection of high quality waters. Such protection is bounded by actions that are consistent with the maximum benefit to the people of the State and best practicable treatment and control of the discharge.

#### *i. Resolution 68-16*

The State issued its antidegradation policy in 1968 to protect and maintain existing water quality in California. The State's Resolution 68-16 is interpreted to incorporate the federal antidegradation policy and satisfies the federal regulation requiring states to adopt their own antidegradation policies. It states, in part:

> (1) Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water and will not result in water quality less than that prescribed in the policies.
>
> (2) Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality water will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained. (Resolution 68-16)

#### *ii. Administrative Procedures Update 90-004*

SWRCB issued guidance (APU 90-004) to all Regional Water Boards in 1990 regarding the implementation of State and federal antidegradation policies in NPDES permits. Using this guidance, Regional Water Boards are to determine if an NPDES discharge is consistent with the intent and purpose of the State and federal antidegradation policies. APU 90-004 provides Regional Water Boards with guidance on the appropriate level of analysis that may be necessary, distinguishing between the need for a "simple" antidegradation analysis and a "complete" antidegradation analysis. If it is determined that a simple analysis is not appropriate based on the estimated level of impact of a discharge, then a more rigorous analysis – a complete analysis – is appropriate. A primary focus of an antidegradation analysis is the determination of whether and the degree to which water quality is lowered. This determination greatly influences the level of analysis required and the level of scrutiny applied to the "balancing test" – that is, whether the discharge is necessary to accommodate important economic and social development, and whether a water quality change is consistent with the maximum benefit to the people of the State.

An antidegradation analysis must address the following questions stated in SWRCB APU 90-004 to maintain consistency with State and federal antidegradation policies.

- Whether a reduction in water quality will be spatially localized or limited with respect to the water body; e.g., confined to the mixing zone;
- Whether a discharge of treated effluent will produce minor effects which will not result in a significant reduction of water quality;
- Whether a discharge of treated effluent has been approved in a General Plan, or similar growth and development policy document, and has been adequately subjected to the environmental analysis required in an environmental impact report (EIR) required under CEQA; and
- Whether the proposed project is consistent with the maximum benefit to the people of the State.

### c. Approach to Antidegradation Analysis

The antidegradation analysis described in this memorandum evaluates first whether current ambient water quality will be degraded if Tracy, Stockton, Manteca, and Fresno continue current operations. The analysis next evaluates the incremental change in water quality from current ambient conditions that would occur if the same communities installed reverse osmosis treatment facilities to meet effluent limits in their current permits. The analysis also includes an assessment of the economic and greenhouse gas impacts resulting from the treatment required to meet existing effluent limits if a variance policy or case-by-case exception is not granted. This information is included to address whether the implementation of a variance or case-by-case exception would be consistent with the maximum benefit of the people of the State provision of the State non-degradation policy.

### d. Analysis of Changes to Current Ambient Water Quality

Under federal and State antidegradation policies, changes to existing ambient concentration is often the typical concern. For the communities in question, implementation of a variance would not measurably affect current water quality, since the discharges in question currently exist and contribute to the current ambient condition, and the loadings in effluent are not increasing. As an example, the recent history of salinity loadings for the City of Tracy WWTP, City of Stockton RWCF, and the City of Manteca WQCF are shown in **Figure 19** through **Figure 21**, respectively. Since loadings are not projected to increase during the period of the variance, the action to establish and implement the specific variances in question for Tracy, Stockton, and Manteca would not be projected to degrade current ambient water quality. Current ambient water quality downstream of these three dischargers would remain the same under a salinity variance as it is today. For the City of Fresno RWRF, salinity concentrations in effluent have been relatively stable over the last five years as shown in **Figure 15** in **Section V**, and are not projected to increase over the next 10 years. However, since the background groundwater concentrations are increasing (see Figure 17: Layer A (< 100 ft bgs) Up-gradient Groundwater Concentrations, 2003 – 2011 (MW-10A).**Figure 17 - Figure** 18 in **Section V**), it is anticipated that the quality of discharge will become better than the quality of background groundwater and therefore will no longer degrade ambient groundwater quality (**Table 14** in **Section V**).

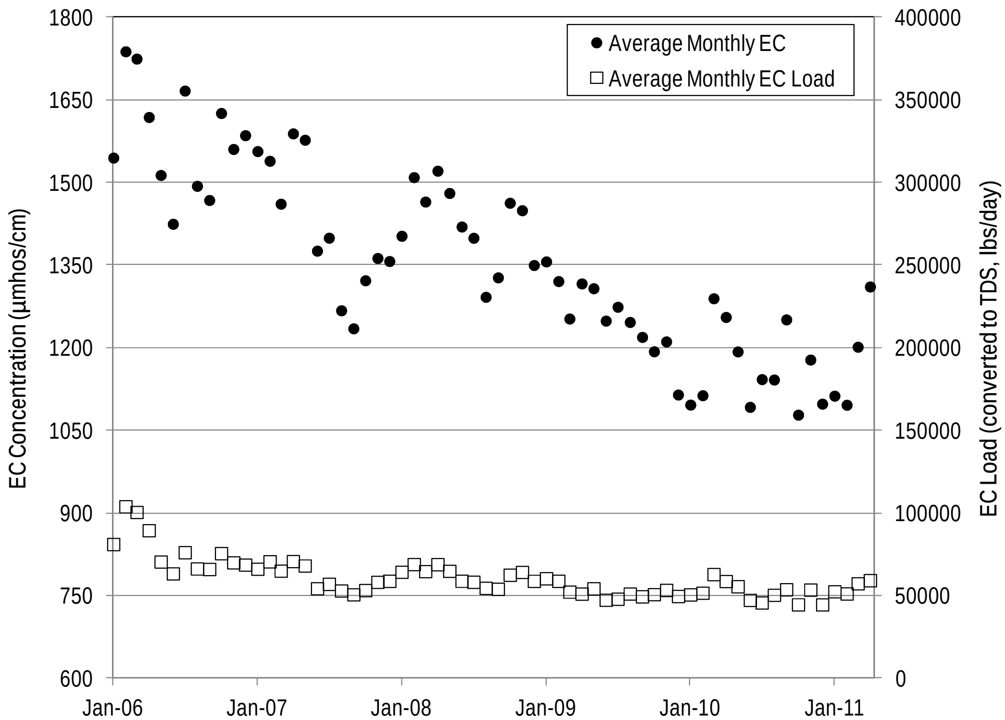


**Figure 19: City of Tracy WWTP: EC Concentrations and Equivalent TDS Loadings.**

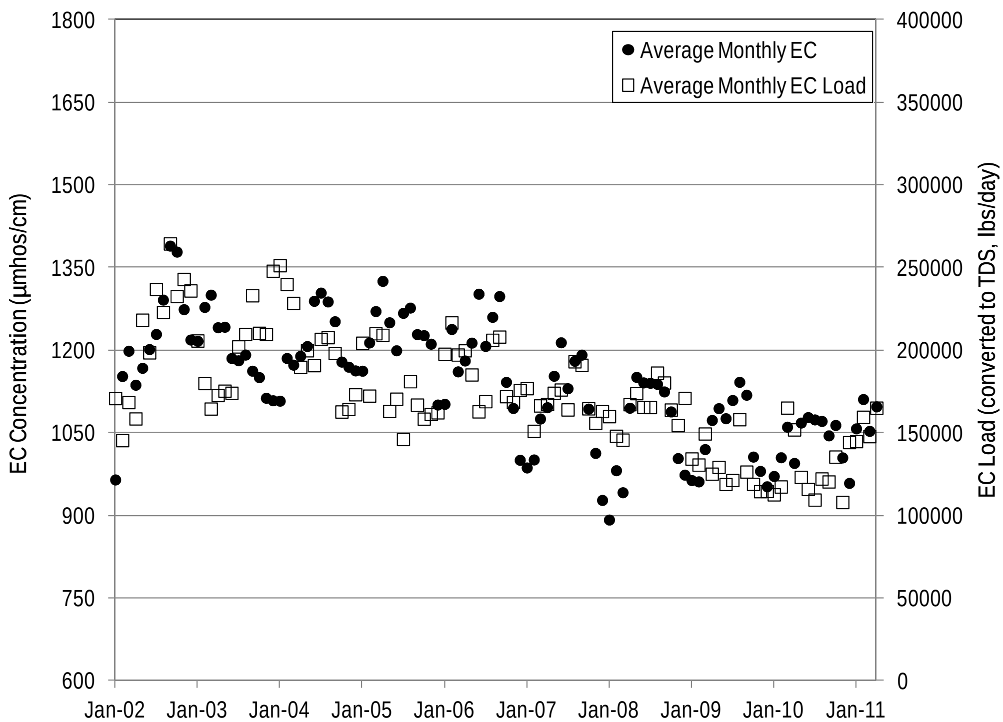


**Figure 20: City of Stockton RWCF: EC Concentrations and Equivalent TDS Loadings.**

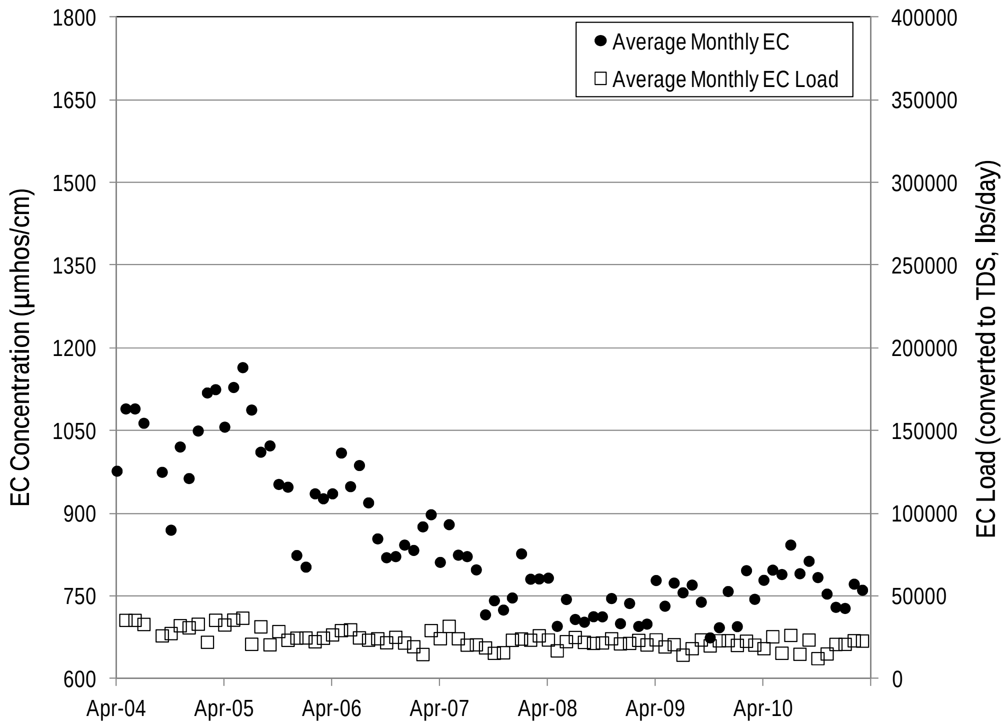


**Figure 21: City of Manteca WQCF: EC Concentrations and Equivalent TDS Loadings.**

As a measure to ensure that current ambient water quality would not be degraded during the period that a variance or case-by-case exception would be implemented, dischargers will be given performance-based effluent limitations for their discharges. **Table 19** contains performance-based effluent limitations for EC and TDS calculated for the three Delta communities and the City of Fresno. These performance-based effluent limitations were calculated using the following rules employed by the Central Valley Water Board in setting performance-based limits in other Central Valley permits:

> "Where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. In situations where the observed maximum effluent concentration (MEC) exceeds the 99.9%, the MEC is used as the interim limit." (Taken from City of Modesto WQCF Order No. R5-2008-0059, page F-60).

In the present analysis, performance-based average monthly effluent limits for electrical conductivity and total dissolved solids were calculated following the above method. The effluent EC and TDS datasets for the cities of Tracy (March 2009 to March 2011), Stockton (October 2006 to April 2011), Manteca (September 2007 to August 2011), and Fresno (January 2005 to March 2011) were compiled and the means and standard deviations calculated. All datasets had more than 10 data points and only one none of the MECs exceeded the calculated limits. The performance-based limits shown in **Table 19** were calculated using available data and could be recalculated, as necessary, using more recent data as they become available.

**Table 19: Performance-Based Average Monthly Effluent Limitations for EC and TDS Calculated for Three Delta Dischargers and the City of Fresno.**

| Parameter | MEC | Mean | Std. Dev. | Number of Samples | Performance-Based AMEL |
|---|---|---|---|---|---|
| *Electrical Conductivity (µmhos/cm)* | | | | | |
| Tracy WWTP | 1418 | 1192 | 98 | 110 | 1495 |
| Stockton WQCF | 1254 | 1059 | 84 | 248 | 1320 |
| Manteca WQCF | 861 | 744 | 51 | 109 | 900 |
| City of Fresno RWRF | 969(1) | 827 | 53 | 75 | 991 |
| *Total Dissolved Solids (mg/L)* | | | | | |
| Tracy WWTP | 856 | 689 | 61 | 111 | 878 |
| Stockton WQCF | 743 | 627 | 54 | 248 | 795 |
| Manteca WQCF | 503 | 446 | 35 | 58 | 555 |
| City of Fresno RWRF | 495(1) | 446 | 24 | 63 | 520 |

Note:

1. Only monthly average data were available, so the MEC is the maximum average monthly value and the number of samples is the number of monthly averages.

## e. Antidegradation Analysis of Implementing Variance and Case-by-case Exception

The water quality baseline examined in this analysis is the ambient water quality that would exist under the current permitted discharges for the case study communities. The current permitted condition presumes compliance with effluent limits at the maximum permitted discharge. In this instance, implementation of a variance may delay, by five to ten years (the anticipated term of a variance or exception), changes in water quality that would otherwise happen if communities installed new RO treatment facilities to achieve existing EC effluent limits. It should be noted that the realization of these impacts presumes that those communities would immediately design and build RO facilities during the five- to ten-year period variance period, rather than exercising their legal rights to question such action. In fact, each of the communities in question has exercised this legal option in reaction to adoption of their current NPDES permits. It should also be noted that no other similarly situated POTWs in the Central Valley or Delta have been required to install reverse osmosis facilities to meet NPDES or WDR requirements for EC.

### *i. Cities of Tracy, Stockton and Manteca – Antidegradation Analysis Applicable to Variance*

The incremental water quality changes associated with the addition of RO treatment facilities for the City of Tracy WWTP, City of Stockton, and the City of Manteca WQCF were assessed in **Section V**. It was determined that the near-field decreases in current ambient water quality associated with the construction and operation of RO treatment facilities to achieve compliance with effluent limits derived from an EC objective of 700 µmhos/cm are not significant, with ambient salinity changes ranging from 0.31% to 2.68% at the locations examined, depending on the water year type or Delta export condition. These larger, near-field, incremental changes are localized; as revealed by the far-field water quality impacts analyses performed for the City of Tracy WWTP. The Tracy far-field analysis estimated changes in EC levels ranging from 0.0% to 1.47% depending on distance downstream from the discharge and Delta export condition. These changes are not significant in magnitude and likely not measurable.

These incremental changes reflect the short-term water quality impact of implementing salinity variances in the Delta in the form of an unrealized beneficial change over the period of the variance. Another way of viewing the slight incremental increases in near-field EC concentrations with the granting of variances is that they represent a short-term delay in achieving a slight improvement in water quality. The actual achievement of a slight improvement in water quality is dependent upon the cities of Tracy, Stockton, and Manteca implementing RO treatment of a portion of their discharge. Until such advanced treatment is implemented, current ambient water quality would not be degraded, nor would current beneficial uses be harmed, with continued discharge from the three facilities under a salinity variance. The very small magnitude of impacts on ambient water quality associated with these municipal discharges are consistent with the recent findings of the State Water Board's February 2012 Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives (page 4-11) (CSWRCB, 2012).

### *ii. City of Fresno – Antidegradation Analysis Applicable to Case-by-Case Exception*

Results from the water quality impacts section were evaluated in conjunction with current groundwater objectives and beneficial uses to determine if granting of a case-by-case effluent limit exception would be consistent with the state groundwater antidegradation policy in Resolution 68-16.

The results from the water quality impacts section indicate that if the case-by case exception is granted, down-gradient groundwater concentrations over the next 10 years are projected to range between 740 and 843 µmhos/cm, which are concentrations that are protective of the most stringent beneficial uses and meet current groundwater quality objectives (see **Table 20**). Granting of the case-by-case exception is estimated to result in a 4 – 6% increase in down-gradient groundwater concentrations as compared to down-gradient concentrations resulting from discharge of effluent partially treated with MF/RO.

Since beans, which are highly sensitive to salts, are not a dominant crop in the vicinity of the RWRF, the site-specific Grattan thresholds are more appropriate for the protection of agricultural uses for the RWRF area than are the Ayers and Westcot thresholds (Corollo, 2009). The WDR interim groundwater objective for EC (990 µmhos/cm[8]) is intended to protect crops sensitive to salinity when using sprinkler irrigation, such as grapes, and was based on maintaining 100 percent yields for crops other than beans (Resolution No. R5-2002-0254-A01 Amending WDR Order No. R5-2001-254 for Fresno-Clovis Metropolitan RWRF).

It should be noted that this 4 – 6% increase in down-gradient groundwater quality does not adversely impact beneficial uses or cause down-gradient groundwater quality to exceed any water quality objectives. Therefore, requiring implementation of MF/RO would be an extremely

[8] The interim groundwater objective was calculated by applying a 10 percent concentration factor to the maximum EC effluent limit of 900 µmhos/cm

costly (see next section) treatment measure that would be unlikely to result in significant improvements to groundwater quality or beneficial uses in the vicinity of the RWRF.

**Table 20: Beneficial Uses and Groundwater Objectives in the Tulare Basin.**

| Source | Beneficial Use | EC Objective (μmhos/cm) |
|---|---|---|
| WDR Interim Groundwater Objective | AGR | 990 |
| Ayers and Westcot (1985) | AGR(1) | 700 |
| | AGR(2) | 700 – 3,000 |
| Grattan Site-Specific Thresholds (2005) | AGR | 1,400 |
| Title 22 | MUN | 900, 1600(3) |

Notes:

1. No restrictions on use.
2. Slight to moderate restrictions on use.
3. Secondary MCLs: recommended and upper limits.

CV Salts is currently developing a Central Valley-wide Salt and Nutrient Management Plan that will provide policy guidance for salt management in the Central Valley. As part of this valley-wide management plan, revised antidegradation requirements or guidance for determining case-by-case exceptions may be developed to best manage future salt loading in the Tulare Basin sometime within the next 10 years.

As this analysis has shown, the degradation associated with granting a case-by-case effluent limit exception is consistent with the requirements of Resolution 68-16, and it is thus recommended that, until new guidelines are developed by CV Salts for management of salts in Tulare Basin, a case-by-case effluent exception should be granted to the City of Fresno RWRF.

### *iii. Socioeconomic Impacts of Not Granting Variances*

The EPA Economic Guidance referenced earlier in **Section V** addresses antidegradation specifically and requires that a project proponent demonstrate that important economic or social development would be prevented unless lower water quality is allowed. The guidance also states that an economic analysis must demonstrate that (a) the discharger would face substantial financial impacts due to the costs of the necessary pollution controls (i.e., a demonstration of “substantial impacts”), and (b) the affected community will bear significant adverse impacts if the discharger is required to meet existing or proposed water quality standards (i.e., a demonstration of “widespread impacts”). An important point to make regarding the granting of a salinity variance for the three Delta communities is that the granting of variances will not degrade current water quality conditions in the Delta, rather such a granting will delay a future slight water quality improvement that would be achieved when the dischargers add RO treatment to their existing facilities to meet final effluent limits for EC contained in their NPDES permits. Furthermore, socioeconomic impacts within the affected communities will result not from the granting of variances, but from the cost of adding RO treatment. To this end, the affected communities will experience socioeconomic impacts as a result of not granting a variance.

The first component of an antidegradation analysis, the assessment of projected water quality impacts due to a proposed action, is presented in **Section V**. The second component of an antidegradation analysis, an assessment of the costs and benefits of maintaining existing water quality in receiving waters is presented in **Section VI** as part of the CFR 131.10(g) analysis. Planning level estimates of the capital and operations and maintenance (O&M) costs associated with implementation of RO treatment to meet the more stringent 700 µmhos/cm effluent limit (April 1 – August 31) for electrical conductivity for the three affected surface water dischargers is provided in **Table 21**.

**Table 21: Planning Level Cost Estimates for Implementation of Reverse Osmosis (RO) Treatment by Three Delta Dischargers.**

| Discharger | RO Treatment (MGD) required to meet 700 µmhos/cm EC Limit[1] | Cost ($ Million) | | | | |
|---|---|---|---|---|---|---|
| | | Capital[2,3] | Annualized Capital[4] | Annual O&M[2,3] | Total Annual[5] | Present Worth[6] |
| City of Tracy | 11.9 | 67.0 | 4.5 | 6.6 | 11.1 | 166 |
| City of Stockton | 37.5 | 211 | 14.1 | 20.9 | 35.0 | 523 |
| City of Manteca | 7.1 | 40.0 | 2.7 | 3.9 | 6.6 | 99 |

Notes:

1. Effluent flow requiring RO treatment to meet a 700 µmhos/cm EC effluent limitation using a 25% safety factor to address the range of influent EC concentrations observed for the facility.
2. Capital and O&M costs developed using: Project Memorandum: Modification of Flow Basis for Treatment Train Costs as Previously Presented in the "Advanced Treatment Alternatives for the Sacramento Regional Wastewater Treatment Plant" (Carollo, March 2009). (Carollo, 2010)
3. Treatment costs include engineering, administrative, legal, and contingency. All costs in June 2012 dollars (ENRCCI 9838). The ENRCCI for Sacramento, CA (9838) was estimated by taking the average ENRCCI for the U.S. 20 Cities (i.e., 20-City Average) and the ENRCCI for San Francisco, CA.
4. Annualized capital costs developed using a 30-year amortization period and 5.25 percent interest rate.
5. Total Annual Cost = Annualized Capital Cost + Annual O&M Cost.
6. Present worth represents the summation of the capital construction cost plus the capitalized annual operation and maintenance cost based on a 30-year planning period and 5.25 percent interest rate.

Construction and operation of RO facilities would require significant capital and long-term costs; the actual cost to each facility will vary depending on the portion of the total flow requiring treatment in order to meet the final effluent limit(s) for salinity. Estimated construction capital costs range from $40.0 to $211 million, and estimated O&M costs range from $3.9 to $20.9 million. Estimated total annual costs range from $6.6 to $35.0 million, and present worth values from construction and operation and maintenance of these facilities range from $99 to $523 million.

As discussed earlier in **Section VI**, the operation of treatment systems that include RO processes would significantly increase the energy demand for each facility, requiring potentially greater power distribution system capacity, back-up power generating capacity, and/or power grid connection capacity. Because RO is an extremely energy-intensive process, increased energy demand would result in a subsequent expansion of greenhouse gas emissions and the carbon footprint of each facility. A summary of the potential increased carbon footprint associated with the operation of these treatment systems is included as **Table 22**.

**Table 22: Additional Greenhouse Gas Emission Associated with the Operation of RO Treatment Systems for Three Delta Dischargers.**

| Discharger | Effluent Treated with RO (MGD) | Estimated Daily Electricity Usage (kWh)[1] | Estimated Daily $CO_2$ Emissions | | Estimated Annual $CO_2$ Emissions (metric tons) |
|---|---|---|---|---|---|
| | | | lbs/day[2] | metric tons/day[2] | |
| City of Tracy | 11.9 | 130,900 | 106,029 | 48.1 | 17,554 |
| City of Stockton | 37.5 | 412,500 | 334,125 | 151.6 | 55,318 |
| City of Manteca | 7.1 | 78,100 | 66,064 | 30.0 | 10,938 |

Notes:
1. Daily power usage based on estimate of 11,000 kWh consumed per million gallons treated with RO (Carollo, 2007).
2. CO2 emissions based on 0.81 lbs of CO2 produced per kWh of electricity consumed (CCAR, 2007).

The RO treatment costs provided in **Table 21** include the cost of thermal brine concentration, crystallization, and land disposal in a traditional landfill. However, if additional treatment of brine waste is needed to accommodate disposal in a traditional landfill, then ultimate RO treatment costs could exceed those presented in **Table 21**. To this end, the costs of advanced treatment presented in **Table 21** represent a low end estimate of the actual financial impacts potentially endured by communities required to implement advanced treatment of their wastewater because the costs do not include the cost of any additional advanced treatment that might be required to render brine waste suitable for disposal in a traditional landfill. As discussed in **Section VI**, these financial impacts are determined to be “substantial” for each affected community.

As discussed in **Section VI**, the current economic conditions experienced by Central Valley communities as a result of the national economic downturn caused by the Great Recession has left these communities more economically challenged than many other areas of the state (see **Table 18**). The additional pollution control costs associated with RO treatment needed to meet final effluent limits for EC included in current NPDES permits would only add to the financial burdens of all households within these communities. Due to the interrelated nature of economies within and between communities in a region, a reduction in disposable personal income (DPI) that would result from higher sewer rates needed to pay for the cost of RO treatment would have a ripple effect on the demand for goods and services within and between communities. A reduction in DPI would cause a change in the spending habits of households within communities that would lead to losses in income and employment. For this reason, requiring communities to construct and operate RO facilities to achieve compliance with EC objectives would constitute a “widespread” economic impact.

The difference in south Delta water quality that would result from the granting of a salinity variance for three Delta surface water dischargers compared to water quality that would be achieved with the implementation of RO treatment to meet final effluent limit objectives for EC is essentially *de minimis*. Furthermore, the granting of a variance would not result in a lowering of current ambient water quality. The granting of a variance would only act to delay a future slight improvement in south Delta water quality by a five- to ten-year period. Therefore, the critical comparison to be made between the granting of a variance and requiring the implementation of RO treatment is a balancing of the slight improvement – at whatever point in time it occurred – in south Delta water quality against the environmental impacts (energy consumption and greenhouse gas emissions) and socioeconomic impacts of RO treatment. The estimated magnitude of the improvement in south Delta water quality as a result of RO treatment does not justify the environmental or socioeconomic expense of achieving such an improvement in water quality. The most beneficial outcome would be the implementation of regulatory approaches that result in requirements which are consistent with the management plans being developed under CV-SALTS and in the State Water Board's Bay-Delta Plan and which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities.

#### *iv. Socioeconomic Impacts of Not Granting a Case-by-Case Exception*

The granting of a case-by-case effluent limit exception for the City of Fresno's land discharge does not require the City to consult the EPA Economic Guidance and demonstrate that important economic or social development would be prevented unless lower water quality is allowed because the granting of a case-by-case exception for a land discharge is not subject to the 40 CFR 131.10(g) requirements that must be met to gain approval for a water quality standards variance for a discharge to surface waters. However, it is important to discuss that the City would endure economic hardships if it was required to implement MF/RO treatment of its effluent to meet final effluent limits for EC contained in its WDR. Similar to the granting of salinity variances for surface water dischargers described above, the granting of a case-by-case exception for the City of Fresno will not degrade current groundwater quality conditions, rather it will delay a future slight groundwater quality improvement that would be achieved when the City added MF/RO treatment to its existing facility to meet the final effluent limit for EC in its WDR. Additionally, socioeconomic impacts to the City of Fresno will not occur with the granting of a case-by-case exception, rather such impacts will occur if the City is required to implement MF/RO treatment of its effluent.

Similar to the socioeconomic impacts analyses conducted for the three Delta surface water dischargers, planning level estimates of the capital and operations and maintenance (O&M) costs associated with implementation of MF/RO treatment to meet the City's source water EC plus 500 µmhos/cm EC effluent limit were calculated and are presented in **Table 23**. It was determined that the City would need to meet a 766 µmhos/cm EC effluent limitation and this figure was used to estimate MF/RO treatment capacity needed to treat a portion of RWRF flow that would produce a blended effluent that would meet the EC effluent limitation. As shown in **Table 23**, construction and operation of MF/RO facilities would require significant capital and long-term costs to meet the City's final effluent limit for salinity. The estimated construction capital cost is $363 million, with an annual O&M cost of $27.5 million. The repayment of loans to fund construction of MF/RO facilities would result in an annualized capital cost of $24.3, for a total annual cost of $51.8 million to be paid by RWRF ratepayers.

**Table 23: Planning Level Cost Estimates for Implementation of Microfiltration (MF) and Reverse Osmosis (RO) Treatment at the Fresno-Clovis RWRF.**

| Discharger | MF/RO Treatment (MGD) required to meet 766 µmhos/cm EC Limit[1] | Cost ($ Million) | | | | |
|---|---|---|---|---|---|---|
| | | Capital[2,3] | Annualized Capital[4] | Annual O&M[2,3] | Total Annual[5] | Present Worth[6] |
| City of Fresno | 34.6 | 363 | 24.3 | 27.5 | 51.8 | 774 |

Notes:

1. The Fresno-Clovis RWRF currently does not include filtration in its treatment process, and therefore the costs presented above include the costs of both microfiltration and reverse osmosis. Effluent flow requiring MF/RO treatment designed to meet a 766 µmhos/cm EC effluent limitation using a 25% safety factor to address the range of influent EC concentrations observed for the facility.
2. Capital and O&M costs developed using: Project Memorandum: Modification of Flow Basis for Treatment Train Costs as Previously Presented in the "Advanced Treatment Alternatives for the Sacramento Regional Wastewater Treatment Plant" (Carollo, March 2009). (Carollo, 2010)
3. Treatment costs include engineering, administrative, legal, and contingency. All costs in June 2012 dollars (ENRCCI 9838). The ENRCCI for Sacramento, CA (9838) was estimated by taking the average ENRCCI for the U.S. 20 Cities (i.e., 20-City Average) and the ENRCCI for San Francisco, CA.
4. Annualized capital costs developed using a 30-year amortization period and 5.25 percent interest rate.
5. Total Annual Cost = Annualized Capital Cost + Annual O&M Cost.
6. Present worth represents the summation of the capital construction cost plus the capitalized annual operation and maintenance cost based on a 30-year planning period and 5.25 percent interest rate.

As discussed above for the three Delta surface water dischargers, the operation of energy intensive treatment processes, such as MF and RO, dramatically increases the carbon footprint of a wastewater treatment facility. **Table 24** presents estimates for daily electricity usage and $CO_2$ emissions that would occur with implementation of MF/RO treatment at the Fresno-Clovis RWRF. It is estimated that an additional 51,040 metric tons of $CO_2$ would be emitted by the RWRF on an annual basis with operation of MF/RO facilities. The estimates shown in **Table 24** are in addition to the electricity usage and $CO_2$ emissions already occurring with operation of existing RWRF treatment facilities. As discussed earlier, increased energy demand by a wastewater treatment facility can potentially require parallel expansion of power distribution systems. While the costs of utility infrastructure expansion are often absorbed by the energy provider, these costs are offset by rate increases to ratepayers.

**Table 24: Additional Greenhouse Gas Emission Associated with the Operation of MF/RO Treatment Systems at the Fresno-Clovis RWRF.**

| Discharger | Effluent Treated with MF/RO (MGD) | Estimated Daily Electricity Usage | | Estimated Daily $CO_2$ Emissions | | Estimated Annual $CO_2$ Emissions (metric tons) |
|---|---|---|---|---|---|---|
| | | MF Treatment (kWh)[1] | RO Treatment (kWh)[2] | lbs/day[3] | metric tons/day[3] | |
| City of Fresno | 34.6 | 3,460 | 380,600 | 308,286 | 139.8 | 51,040 |

Notes:

1. Daily power usage based on estimate of 100 kWh consumed per million gallons treated with MF (AWWARF, 2008).
2. Daily power usage based on estimate of 11,000 kWh consumed per million gallons treated with RO (Carollo, 2007).
3. CO2 emissions based on 0.81 lbs of CO2 produced per kWh of electricity consumed (CCAR, 2007).

The MF/RO treatment costs provided in **Table 23** include the cost of thermal brine concentration, crystallization, and land disposal in a traditional landfill. However, if additional treatment of brine waste is needed to accommodate disposal in a traditional landfill, then ultimate MF/RO treatment costs could exceed those presented in **Table 23**. To this end, the costs of advanced treatment for the City of Fresno presented in **Table 23** represent a low end estimate of the actual financial impacts potentially endured by City if required to implement advanced treatment of its wastewater because the costs do not include the cost of any additional advanced treatment that might be required to render brine waste suitable for disposal in a traditional landfill.

The City of Fresno has experienced economic hardships in recent years similar to those experienced by other Central Valley communities, and these communities have been hit harder by the Great Recession than many other areas in the state. In line with the labor force information provided in **Table 18** for the three Delta dischargers, the City of Fresno posted a 14.3% unemployment rate for the month of June 2012, which was one percentage point lower than that of Fresno County[9]. The additional pollution control costs associated with MF/RO treatment needed to meet final effluent limits for EC included in the City's current WDR would only add to the financial burdens of all households within the community. Due to the interrelated nature of economies within and between communities in a region, a reduction in disposable personal income (DPI) that would result from higher sewer rates needed to pay for the cost of MF/RO treatment would have a ripple effect on the demand for goods and services within the City of Fresno and between communities in the region. A reduction in DPI would cause a change in the spending habits of households within the City that would lead to losses in income and employment.

The difference in groundwater quality that would result from the granting of a case-by-case exception to EC limits for the City of Fresno compared to groundwater quality that would be achieved with the implementation of MF/RO treatment to meet final effluent limit objectives for EC is essentially *de minimis*. Furthermore, the granting of a case-by-case exception would not result in a lowering of current ambient groundwater quality. The granting of a case-by-case exception would only act to delay a future slight improvement in groundwater quality by a five- to ten-year period. Therefore, the critical comparison to be made between the granting of a case-by-case exception and requiring the implementation of MF/RO treatment is a balancing of the slight improvement – at whatever point in time it occurred – in groundwater quality against the environmental impacts (energy consumption and greenhouse gas emissions) and socioeconomic impacts of MF/RO treatment. The estimated magnitude of the improvement in groundwater quality as a result of MF/RO treatment does not justify the environmental or socioeconomic expense of achieving such an improvement in groundwater quality. The most beneficial outcome would be the implementation of regulatory approaches that result in requirements which are consistent with the management plans being developed under CV-SALTS which are commensurate with the water quality benefits that can be achieved through reasonable management actions by Central Valley communities.

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[9] Data obtained from Employment Development Department Labor Market Information web site (http://www.labormarketinfo.edd.ca.gov./), State of California.

### f. Antidegradation Analysis Conclusions

The following findings are derived from the analysis presented above.

- No ambient water quality effects would result from implementation of an EC water quality standards variance in the Delta or a case-by-case exception to the Tulare Lake effluent limits. Small, incremental changes in water quality associated with compliance with existing effluent limits would be delayed through implementation of a variance policy and/or case-by-case exception. The magnitude of the delays and the water quality changes are not sufficient to cause consistency issues with the federal and State antidegradation policies.
- No change in the attainment of beneficial uses would occur with implementation of the proposed variances or case-by-case exceptions.
- Significant costs would be required to comply with existing effluent limits for EC, leading to widespread and substantial economic effects in affected communities, as described in **Section VI**.
- Construction and operation of RO treatment facilities to meet EC limits is a poor investment of resources, given the lack of water quality improvement that would result and the uncertainty regarding the future water quality standards and Basin Plan provisions that would support such limits.
- For the short period of effect of a variance or case-by-case exception, it is to the maximum benefit to the people of the State to implement such proposed actions, in lieu of forcing construction and operation of RO treatment facilities.

The above findings support a conclusion that establishment and implementation of a variance from EC water quality standards or a case-by-case exception to the EC effluent limits specified in the Tulare Lake Basin Plan are consistent with the federal and State antidegradation policies.

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# Appendix A: Summary and Description of CV-SALTS Initiative

This appendix contains a summary and description of the Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) initiative, including goals and objectives, actively involved stakeholders, accomplishments to date, the proposed schedule, and sources of funding. Information in this appendix is sourced from CV-SALTS 2012a, CV-SALTS 2012b, and CV-SALTS 2012c. Additional information can be found online at the CV-SALTS web-site: http://cvsalinity.org/.

## a. Summary of CV-SALTS Goals and Objectives

The CV-SALTS initiative is a stakeholder-led process to establish a long-term policy framework for salt and nitrate management for the Central Valley, to be developed and implemented through amendments to the three water quality control plans within the Central Valley Water Board's jurisdictional area: the Sacramento-San Joaquin Basin Plan, the Tulare Lake Basin Plan, and the Bay-Delta Plan. The effort focuses on a Central Valley Water Board basin plan amendment process that will result in the development of a Salt and Nitrate Management Plan for the Central Valley, as well as other changes to the basin plans (e.g., beneficial uses, standards, implementation plans). Per the *CV-SALTS – Strategy and Framework* document *CV-SALTS, 2012b), the basin plan amendment process will establish:

- A revised regulatory structure (Beneficial Uses [BU] and Water Quality Objectives [WQO]) and policies to facilitate salt and nitrate management;
- Policies and procedures to evaluate compliance with Basin Plan uses and objectives and provide the regulatory flexibility needed to make salt and nitrate management decisions at the appropriate geographic or management scale; and
- The basis for short and long-term management of salt and nitrate across the Central Valley at appropriate geographic scales.

The CV-SALTS initiative is the primary mechanism by which the Central Valley Water Board will conduct the necessary studies, research and develop technical and scientific reports to develop all components of the basin plan amendment, and implement the Central Valley Salt and Nitrate Management Plan once it is adopted. The necessary work includes data collection, database development, modeling, monitoring, research, studies, and pilot project study programs.

## b. Actively Involved CV-SALTS Stakeholders

The Central Valley Salt and Nitrate Management Plan is being developed through a stakeholder process. Due to the complexity and far-reaching impacts of the Salt and Nitrate Management Plan, the Central Valley Water Board has determined that any and all users of Central Valley waters, within and outside of the Central Valley Water Board's jurisdictional area, are considered to be stakeholders for this Salt and Nitrate Management Plan. The Central Valley Water Board believes all stakeholders should be closely involved in the development of basin plan amendments that could affect the use designation and quality of Central Valley waters.

The Central Valley Salinity Coalition (CVSC) is a non-profit coalition of public agencies, businesses, associations, and other members which was formed in July 2008 to integrate and augment the efforts of the CV-SALTS Initiative. A Memorandum of Agreement and standing rules describe the working commitments of the Central Valley Water Board, State Water Board, and CVSC in the development and implementation of CV-SALTS. The purpose of the organization is to govern and organize the efforts needed to plan, develop and implement the Central Valley Salt and Nitrate Management Plan (Central Valley Salinity Coalition, 2009).

CVSC currently consists of 667 members, including, but not limited to, the following (*denotes Board of Directors participation):

- California League of Food Processors*
- California Rice Commission*
- California Association of Sanitation Agencies*
- Central Valley Clean Water Agencies*
- City of Manteca*
- City of Modesto*
- City of Stockton*
- City of Tracy*
- City of Vacaville*
- City of Fresno*
- County of San Joaquin*
- Discovery Bay CSD
- East San Joaquin Water Quality Coalition*
- Iron House Sanitary District
- LA County Sanitation District
- Pacific Water Quality Association
- Sacramento Regional County Sanitation District*
- San Joaquin River Group Authority*
- San Joaquin Valley Drainage Authority*
- Stockton East Water District*
- The Wine Institute*
- Tulare Lake Drainage and Water Districts*
- Western Plant Health Association*
- Western United Dairymen

## c. Overview of CV-SALTS Accomplishments

Since its inception, CV-SALTS has accomplished several tasks, either as stakeholder committee projects or as contracted elements. Stakeholder-driven efforts have included the following:

- Knowledge Gained Subcommittee review of two salt source identification and interaction studies, the Salinity Source Pilot Study and the Turlock Basin Salinity Study, comprising 14% of the Central Valley (i.e., the Sacramento, San Joaquin, and Tulare Basins);
- Knowledge Gained Subcommittee Guidance for future Salinity Identification Studies;
- Interim and Subsequent Salinity Project Funding Plan;
- Management Practices Subcommittee Guidance for Development of a Salt and Nitrate BMP Toolbox;
- Technical recommendations regarding use of modeling tools to develop site specific salinity objectives;
- Scoped salinity and nitrate water quality criteria review for stock watering; and
- Draft revised Chapter 18 (Salt and Salinity Management) for the California Water Plan.

In addition, contract-supported efforts have included the following:

- GIS database and beneficial use maps for the Central Valley and Delta;
- Scoped salinity and nitrate water quality criteria review for aquatic life; and
- Improved functionality of the CV-SALTS website.

During 2010-2011, the CV-SALTS Executive Committee has focused on the development of a more robust project policy and framework, as well as retooling the initial project scope and Work Plan accordingly. This work builds off of the projects completed to date and is a critical element to guide future CV-SALTS activities. Discussions have been focused on appropriate beneficial use designation in both surface and groundwater (primarily for municipal/domestic supply and agricultural irrigation/stock watering), with future meetings scheduled to review appropriate salt and nitrate water quality objectives related to beneficial uses, consideration of the antidegradation policy, and options available to amend current basin plan language.

### d. CV-SALTS Draft Timeline for Completion of Work

The deadline for development of the Central Valley Salt and Nitrate Management Plan is May 14, 2014, which satisfies the State Water Board’s Recycled Water Policy. In February 2012, CV-SALTS approved a 5-Year Work Plan and strategy framework.

The current schedule for the Basin Plan amendment process and the development of the Central Valley Salt and Nitrate Management Plan (CV-SNMP) is as follows:

- **September 2012 – March 2013:**
    - Policy discussions on beneficial uses and appropriate water quality objectives, including criteria for “incidental” MUN, default values for crop protection and leaching fractions for use with salinity models, and guidance for determining the most limiting crop within a sub-basin
    - Complete initial conceptual model (ICM) of salt and nitrate source/interaction
    - Begin Phase 2 of CV-SNMP

  - Complete upgrades to Central Valley beneficial use and water quality objective geospatial database

- **April 2013 – May 2014:**
  - Complete Phase 2 and Phase 3 of Central Valley SNMP
  - Complete technical studies for archetypes
  - Identify management alternatives
  - CEQA scoping session(s); Finalize CEQA Equivalent Documentation; hold Public Meetings
  - Finalize and submit Central Valley Salt and Nitrate Management Plan (CV-SNMP)
  - Initiate draft basin plan amendment language

- **June 2014 – May 2015:** Final regulatory approval process, Prepare Final CV-SNMP, Board Adoption of Final CV-SNMP
- **May 2015 – Future:** Long-term CV-SNMP regional implementation

### e. Sources of CV-SALTS Funding and Expenditures

On March 17, 2009, the State Water Board adopted a resolution allocating $1.2 million from the Cleanup and Abatement Account to the Central Valley Water Board in support of the development of a salinity and nutrient management plan for the Central Valley. This funding will be used to support a Salinity and Nitrate Objective and Beneficial Use Study Project, which will establish a model using existing, reliable, and usable data from regions and water bodies within the Central Valley. This model will then be used to establish beneficial uses and objectives for regions where little or no data exists. Of the $1.2 million in Cleanup and Abatement Account funding provided through Resolution #2009-0023, all funding has been obligated to contracts. As of September 2011, $250,000 has been expended.

An additional $3.8 million in Cleanup and Abatement funding will be available to support continued tasks in the implementation of the CV-SALTS work plan. Funding is also provided through CVSC member contributions and various in-kind services contributions. CVSC members have provided over $1 million in financial contributions through membership fees. CVSC members and other organizations have also provided studies, grants and other support for the CV-SALTS effort totaling more than $570,000.

# Appendix B: Summary of Alternative Regulatory Approaches

USEPA and Central Valley Water Board staff requested a summary of the advantages and disadvantages of alternative regulatory approaches to variance program to resolve the current NPDES permitting dilemma concerning salinity in the Central Valley. Several alternatives were previously assessed within a document entitled “Preliminary Evaluation of Alternative Regulatory Options”, submitted May 13, 2010, to the Central Valley Water Board as an attachment to the document, “NPDES and Waste Discharge Requirement Permitting Dilemma regarding Effluent Limits for Salts in the Central Valley”. The preliminary conclusion drawn from the evaluation was that variances may offer the best near-term option to address the current permitting dilemma.

One of the NPDES permittees in question, the City of Tracy WWTP, is subject to waste discharge requirements as promulgated by the Central Valley Water Board in Order No. R5-2007-0036 (CRWQCB, Central Valley Region, 2007). Final effluent limitations for EC consistent with those in the Bay-Delta Plan are delineated in Section IV.A.1.i. of that Order; however, they are only effective if the City of Tracy does not submit a Salinity Plan or fails to implement such a Salinity Plan in a timely manner after it is approved. That is, if the City of Tracy submits and implements an approved Salinity Plan, no enforceable final effluent limitations for EC are specified.

Petitions were filed with the State Water Board requesting review of this Order. In response to some of the objections raised by one of several petitioners (California Sportfishing Protection Alliance (CALSPA)), the State Water Board issued a remand order (Order WQ 2009-0003, dated May 19, 2009) (CSWRCB, 2009a) that addressed, among other issues, the final effluent limitations for EC. This remand order requires the Central Valley Water Board to amend Order No. R5-2007-0036 “to include a final effluent limitation for EC in compliance with the objectives in the Bay-Delta Plan, and, if appropriate, initiate a water quality planning process” to achieve compliance without the need for reverse osmosis. The State Water Board suggested that the following be considered when evaluating “interim” planning options to resolve the salinity problem for the City of Tracy, although it does not comment on the appropriateness of any of these options:

- City of Tracy salt reduction study
- TMDL for EC in Old River
- Site-specific objectives in the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Sacramento-San Joaquin Basin Plan)
- Request to State Water Board for amendment to the Bay-Delta Plan
- Outcomes from CV-SALTS
- Near-term planning options:
    - Variances
    - Site-specific objectives

- Policy allowing offsets

The State Water Board also suggested that if this route is taken, both short- and long-term management strategies should be implemented. In Order WQ 2009-0003, the State Water Board acknowledged that “while salts present a difficult long-term management challenge, they are more amenable to interim planning solutions than bioaccumulative or toxic pollutants” (p. 10, footnote 17). In other words, the water quality impacts associated with salt concentrations tend to be chronic rather than acute and manifest in the long-term rather than the short-term. The implication is that approval of one of the interim approaches suggested above may be easier for salts than for other pollutants.

The possible solutions to the salinity problem vary depending on whether the impacted discharge is to surface waters (subject to NPDES permits), or to land (subject to WDRs). For dischargers subject to NPDES permits, the concept of utilizing a water quality standards variance to promote productive actions in the management of salts and to avoid unreasonable permit compliance problems in the Central Valley has been identified. For land dischargers, the concept of developing a procedure for issuing case-by-case exceptions from meeting salt requirements has also been identified. It is useful for the Central Valley Water Board to have a mechanism to address the situation where discharger compliance with water quality standards is infeasible at the present time and changes in those standards and/or the implementation of those standards is being evaluated.

# ATTACHMENT 8

## fTITLE 22, CALIFORNIA CODE OF REGULATIONS
## DIVISION 4, CHAPTER 15, ARTICLE 5.5

### (1) Amend Section 64444 to read as follows:

**§ 64444. Maximum Contaminant Levels – Organic Chemicals.**

The MCLs for the primary drinking water chemicals shown in ~~T~~table 64444-A shall not be exceeded in the water supplied to the public.

**Table 64444-A**

**Maximum Contaminant Levels**

**Organic Chemicals**

| *Chemical* | *Maximum Contaminant Level, mg/L* |
|---|---|
| (a) Volatile Organic Chemicals (VOCs) | |
| Benzene | 0.001 |
| Carbon Tetrachloride | 0.0005 |
| 1,2-Dichlorobenzene | 0.6 |
| 1,4-Dichlorobenzene | 0.005 |
| 1,1-Dichloroethane | 0.005 |
| 1,2-Dichloroethane | 0.0005 |
| 1,1-Dichloroethylene | 0.006 |
| cis-1,2-Dichloroethylene | 0.006 |
| trans-1,2-Dichloroethylene | 0.01 |
| Dichloromethane | 0.005 |
| 1,2-Dichloropropane | 0.005 |
| 1,3-Dichloropropene | 0.0005 |
| Ethylbenzene | 0.3 |
| Methyl-*tert*-butyl ether | 0.013 |
| Monochlorobenzene | 0.07 |
| Styrene | 0.1 |

| | |
|---|---|
| 1,1,2,2-Tetrachloroethane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Tetrachloroethylene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.005 |
| Toluene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.15 |
| 1,2,4-Trichlorobenzene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.005 |
| 1,1,1-Trichloroethane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.200 |
| 1,1,2-Trichloroethane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.005 |
| Trichloroethylene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.005 |
| Trichlorofluoromethane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.15 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane. . . . . . . . . . . . . . . . . . . . . . . . . . . . | 1.2 |
| Vinyl Chloride. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0005 |
| Xylenes. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 1.750* |
| (b) ~~Non-Volatile~~ Synthetic Organic Chemicals (SOCs) | |
| Alachlor. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.002 |
| Atrazine. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Bentazon. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.018 |
| Benzo(a)pyrene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0002 |
| Carbofuran. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.018 |
| Chlordane. . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0001 |
| 2,4-D. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.07 |
| Dalapon. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.2 |
| Dibromochloropropane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0002 |
| Di(2-ethylhexyl)adipate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.4 |
| Di(2-ethylhexyl)phthalate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.004 |
| Dinoseb. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.007 |
| Diquat. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.02 |
| Endothall. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.1 |
| Endrin. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.002 |
| Ethylene Dibromide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00005 |
| Glyphosate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.7 |
| Heptachlor. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00001 |

| | |
|---|---|
| Heptachlor Epoxide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00001 |
| Hexachlorobenzene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Hexachlorocyclopentadiene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.05 |
| Lindane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0002 |
| Methoxychlor. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.03 |
| Molinate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.02 |
| Oxamyl. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.05 |
| Pentachlorophenol. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Picloram. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.5 |
| Polychlorinated Biphenyls. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0005 |
| Simazine. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.004 |
| Thiobencarb. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.07 |
| Toxaphene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.003 |
| 1,2,3-Trichloropropane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.000005 |
| 2,3,7,8-TCDD (Dioxin). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | $3 \times 10^{-8}$ |
| 2,4,5-TP (Silvex) | 0.05 |

*MCL is for either a single isomer or the sum of the isomers.

NOTE: Authority cited: Sections 116271, 116350 and 116365, Health and Safety Code. Reference: Sections 116365, 116385, and 116555, Health and Safety Code.

## (2) Amend Section 64445 to read as follows:

### § 64445. Initial Sampling – Organic Chemicals

(a) No change to text

(b) No change to text

(c) No change to text

(d) No change to text

(e) No change to text

(f) No change to text

(g) MTBE ~~D~~data (i.e., a single sample) collected in a manner consistent with this section after January 1, 1998 in which no MTBE is detected, along with a designation of nonvulnerability pursuant to subsection (d), may be used to satisfy the initial monitoring requirements in subsection (a). If the requirements are satisfied in this way by a water system, the system shall begin annual monitoring pursuant to section 64445.1(b)(1).

(h) No change to text

(i) Results obtained from groundwater monitoring performed for an organic chemical in accordance with this section and not more than two calendar years prior to the effective date of a regulation establishing the MCL for that organic chemical may be substituted to partially satisfy the initial monitoring requirements required by this section for that organic chemical. Requests to substitute groundwater monitoring results shall be made in accordance with the following:

1. Requests shall be made in writing by the water system to the State Board; and
2. If the State Board approves the request then results from a given calendar quarter will only be eligible to substitute for a single required initial monitoring result during that same quarter of initial monitoring. (e.g. the second quarter of 2016 may be substituted for the second quarter of 2018).

3. No more than three of the four quarterly samples as required by 64445(a) or (b) may be substituted.

NOTE: Authority cited: Sections 116271, 116350 and 116375, Health and Safety Code. Reference: Sections 116385 and 116555, Health and Safety Code.

**(3) Amend Section 64445.1 to read as follows:**

## § 64445.1. Repeat Monitoring and Compliance – Organic Chemicals.

(a) For the purposes of this article, detection shall be defined by the detection limits for purposes of reporting (DLRs) in ~~T~~table 64445.1-A:

**Table 64445.1-A**
**Detection Limits for Purposes of Reporting (DLRs)**
**for Regulated Organic Chemicals**

| *Chemical* | *Detection Limit for Purposes of Reporting (DLR) (mg/L)* |
|---|---|
| (a) All VOCs, except as listed | 0.0005 |
| Methyl-*tert*-butyl ether | 0.003 |
| Trichlorofluoromethane | 0.005 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.01 |
| (b) SOCs | |
| Alachlor | 0.001 |
| Atrazine | 0.0005 |
| Bentazon | 0.002 |
| Benzo(a)pyrene | 0.0001 |
| Carbofuran | 0.005 |
| Chlordane | 0.0001 |
| 2,4-D | 0.01 |
| Dalapon | 0.01 |
| Dibromochloropropane (DBCP) | 0.00001 |
| Di(2-ethylhexyl)adipate | 0.005 |
| Di(2-ethylhexyl)phthalate | 0.003 |
| Dinoseb | 0.002 |

| | |
|---|---|
| Diquat. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.004 |
| Endothall. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.045 |
| Endrin. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0001 |
| Ethylene dibromide (EDB). . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00002 |
| Glyphosate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.025 |
| Heptachlor. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00001 |
| Heptachlor epoxide. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.00001 |
| Hexachlorobenzene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0005 |
| Hexachlorocyclopentadiene. . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Lindane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0002 |
| Methoxychlor. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.01 |
| Molinate. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.002 |
| Oxamyl. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.02 |
| Pentachlorophenol. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.0002 |
| Picloram. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Polychlorinated biphenyls (PCBs) | |
| (as decachlorobiphenyl). . . . . . . . .. . . . . . . . . . . . . . . . . . . . | 0.0005 |
| Simazine. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Thiobencarb. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| Toxaphene. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |
| <u>1,2,3-Trichloropropane. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .</u> | <u>0.000005</u> |
| 2,3,7,8-TCDD (Dioxin). . . . . . . . . . . . . . . . . . . . . . . . . . . . . | $5 \times 10^{-9}$ |
| 2,4,5-TP (Silvex). . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | 0.001 |

(b) When organic chemicals are not detected pursuant to ~~T~~<u>t</u>able 64445.1-A.

(1) A water system which has not detected any of the VOCs on ~~T~~<u>t</u>able 64444-A during the initial four quarters of monitoring, shall collect and analyze one sample annually. After a minimum of three years of annual sampling with no detection of a VOC in ~~T~~<u>t</u>able 64444-A, a system using groundwater may reduce the monitoring

frequency to one sample during each compliance period. A system using surface water shall continue monitoring annually.

(2) A system serving more than 3,300 persons which has not detected an SOC on ~~T~~table 64444-A during the initial four quarters of monitoring shall collect a minimum of two quarterly samples for that SOC in one year during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(3) A system serving 3,300 persons or less which has not detected an SOC on ~~T~~table 64444-A during the initial four quarters of monitoring shall collect a minimum of one sample for that SOC during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(c) When organic chemicals are detected pursuant to ~~T~~table 64445.1-A.

(1) Prior to proceeding with the requirements of paragraphs ~~(c)~~(2) through (7), the water supplier may first confirm the analytical result, as follows: Within seven days from the notification of an initial finding from a laboratory reporting the presence of one or more organic chemicals in a water sample, the water supplier shall collect one or two additional sample(s) to confirm the initial finding. Confirmation of the initial finding shall be shown by the presence of the organic chemical in either the first or second additional sample, and the detected level of the contaminant for compliance purposes shall be the average of the initial and confirmation sample(s). The initial finding shall be disregarded if two additional samples do not show the presence of the organic chemical.

(2) If one or both of the related organic chemicals heptachlor and heptachlor epoxide are detected, subsequent monitoring shall analyze for both chemicals until there has been no detection of either chemical for one compliance period.

(3) A groundwater sampling site at which one or more of the following chemicals has been detected shall be monitored quarterly for vinyl chloride: trichloroethylene,

tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene. If vinyl chloride is not detected in the first quarterly sample, the sampling site shall be monitored once for vinyl chloride during each compliance period.

(4) If the detected level of organic chemicals for any sampling site does not exceed any shown in ~~T~~table 64444-A, the water source shall be resampled every three months and the samples analyzed for the detected chemicals. After one year of sampling an approved surface water system or two quarters of sampling a groundwater system, the State Board will consider allowing the water supplier to reduce the sampling to once per year upon request, based on a review of previous sampling data. Systems shall monitor during the quarter(s) which previously yielded the highest analytical results.

(5) If the detected level of an organic chemical for any sampling site exceeds that listed in ~~T~~table 64444-A, the water supplier shall report this information to the State Board within 48 hours of receipt of the result. Unless use of the contaminated source is discontinued, the water supplier shall resample the contaminated source and compliance shall be determined as follows:

(A) Water systems serving more than 3,300 persons shall sample monthly for six months and shall submit the results to the State Board as specified in ~~S~~section 64469. If the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples does not exceed the MCL shown in ~~T~~table 64444-A the water supplier may reduce the sampling frequency to once every three months. If the running annual average or the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples exceeds the MCL shown in ~~T~~table 64444-A, the water system shall be deemed to be in violation of ~~S~~section 64444.

(B) Water systems serving 3,300 persons or less shall sample quarterly for a minimum of one year and shall submit the results to the State Board as specified in ~~S~~section 64469. If the running annual average concentration does not exceed the MCL in ~~T~~table 64444-A, the water supplier may reduce the sampling frequency to once every year during the quarter that previously yielded the highest analytical result. Quarterly monitoring shall resume if any reduced frequency sample result exceeds the MCL. If the running annual average concentration exceeds the MCL in ~~T~~table 64444-A, the water system shall be deemed to be in violation of ~~S~~section 64444.

(C) If any sample would cause the running annual average to exceed the MCL, the water system is immediately in violation. If a system takes more than one sample in a quarter, the average of all the results for that quarter shall be used when calculating the running annual average. If a system fails to complete four consecutive quarters of monitoring, the running annual average shall be based on an average of the available data.

(6) If any resample, other than those taken in accordance with paragraph ~~(c)~~(5) ~~of this section~~, of a water sampling site shows that the concentration of any organic chemical exceeds a MCL shown in ~~T~~table 64444-A, the water supplier shall proceed in accordance with paragraphs ~~(c)~~(1) and ~~(c)~~(4), or paragraph ~~(c)~~(5).

(7) If an organic chemical is detected and the concentration exceeds ten times the MCL, the water supplier shall notify the State Board within 48 hours of the receipt of the results and the contaminated site shall be resampled within 48 hours to confirm the result. The water supplier shall notify the State Board of the result of the confirmation sample(s) within 24 hours of the receipt of the confirmation result(s).

(A) If the average concentration of the original and confirmation sample(s) is less than or equal to ten times the MCL, the water supplier shall proceed in accordance with ~~subsection~~paragraph ~~(c)~~(5).

(B) If the average concentration of the original and confirmation samples exceeds ten times the MCL, use of the contaminated water source shall immediately be discontinued, if directed by the State Board. Such a water source shall not be returned to service without written approval from the State Board.

NOTE: Authority cited: Sections 116271, 116350 and 116375, Health and Safety Code. Reference: Sections 116385, 116450, 116460, and 116555, Health and Safety Code.

**TITLE 22, CALIFORNIA CODE OF REGULATIONS**
**DIVISION 4, CHAPTER 15, ARTICLE 12**

**(4) Amend Section 64447.4 to read as follows:**

**§ 64447.4. Best Available Technologies (BAT) – Organic Chemicals.**

The technologies listed in ~~T~~table 64447.4-A are the best available technology, treatment technologies, or other means available for achieving compliance with the MCLs in ~~T~~table 64444-A for organic chemicals.

**Table 64447.4-A**
**Best Available Technologies (BATs)**
**Organic Chemicals**

| *Chemical* | *Best Available Technologies* | | |
|---|---|---|---|
| | Granular Activated Carbon | Packed Tower Aeration | Oxidation |
| (a) Volatile Organic Chemicals (VOCs) | | | |
| Benzene | X | X | |
| Carbon Tetrachloride | X | X | |
| 1,2-Dichlorobenzene | X | X | |
| 1,4-Dichlorobenzene | X | X | |
| 1,1-Dichloroethane | X | X | |
| 1,2-Dichloroethane | X | X | |
| 1,1-Dichloroethylene | X | X | |
| cis-1,2-Dichloroethylene | X | X | |
| trans-1,2-Dichloroethylene | X | X | |
| Dichloromethane | | X | |
| 1,2-Dichloropropane | X | X | |
| 1,3-Dichloropropene | X | X | |
| Ethylbenzene | X | X | |

| | | |
|---|---|---|
| Methyl-*tert*-butyl ether | | X |
| Monochlorobenzene | X | X |
| Styrene | X | X |
| 1,1,2,2-Tetrachloroethane | X | X |
| Tetrachloroethylene | X | X |
| Toluene | X | X |
| 1,2,4-Trichlorobenzene | X | X |
| 1,1,1-Trichloroethane | X | X |
| 1,1,2-Trichloroethane | X | X |
| Trichlorofluoromethane | X | X |
| Trichlorotrifluoroethane | X | X |
| Trichloroethylene | X | X |
| Vinyl Chloride | | X |
| Xylenes | X | X |
| (b) Synthetic Organic Chemicals (SOCs) | | |
| Alachlor | X | X |
| Atrazine | X | |
| Bentazon | | X |
| Benzo(a)pyrene | X | |
| Carbofuran | X | |
| Chlordane | X | |
| 2,4-D | X | |
| Dalapon | X | |
| Di(2-ethylhexyl)adipate | X | X |
| Dinoseb | X | |
| Diquat | X | |
| 1,2-Dibromo-3-chloropropane | X | X |
| Di(2-ethylhexyl)phthalate | X | |
| Endothall | X | |
| Endrin | X | |

| | | | |
|---|---|---|---|
| Ethylene Dibromide | X | X | |
| Glyphosate | | | X |
| Heptachlor | X | | |
| Heptachlor epoxide | X | | |
| Hexachlorocyclopentadiene | X | X | |
| Lindane | X | | |
| Methoxychlor | X | | |
| Molinate | X | | |
| Oxamyl | X | | |
| Picloram | X | | |
| Pentachlorophenol | X | | |
| Polychlorinated Biphenyls | X | | |
| Simazine | X | | |
| Thiobencarb | X | | |
| **[delete this empty line]** | | | |
| Toxaphene | X | X | |
| 1,2,3-Trichloropropane | X | | |
| 2,3,7,8-TCDD (Dioxin) | X | | |
| 2,4,5-TP (Silvex) | X | | |

NOTE: Authority cited: Sections 116271, 116350, ~~116370~~, and 116375, Health and Safety Code. Reference: Section ~~116350~~116370, Health and Safety Code.

**TITLE 22, CALIFORNIA CODE OF REGULATIONS**
**DIVISION 4, CHAPTER 15, ARTICLE 18**

**(5) Amend Section 64465 to read as follows:**

**§ 64465. Public Notice Content and Format.**

(a) through (d) *No Change to Text.*

**Appendix 64465-A. Health Effects Language**

**Microbiological Contaminants~~.~~**

| ***Contaminant*** | ***Health Effects language*** |
|---|---|
| Total Coliform | *No Change to Text.* |
| Fecal coliform/*E.coli* | *No Change to Text.* |
| Turbidity | *No Change to Text.* |

**Appendix 64465-B. Health Effects Language**

**Surface Water Treatment**

| ***Contaminant*** | ***Health Effects language*** |
|---|---|
| <u>*Giardia lamblia*</u><br>Viruses<br>Heterotrophic plate count bacteria<br><u>*Legionella*</u><br><u>*Cryptosporidium*</u> | *No Change to Text.* |

**Appendix 64465-C. Health Effects Language**

**Radioactive Contaminants~~.~~**

| ***Contaminant*** | ***Health Effects Language*** |
|---|---|
| Gross Beta particle activity | *No Change to Text.* |
| Strontium-90 | *No Change to Text.* |
| Tritium | *No Change to Text.* |

| | |
|---|---|
| Gross Alpha particle activity | *No Change to Text.* |
| Combined Radium 226/228 | *No Change to Text.* |
| Total Radium (for nontransient noncommunity water systems) | *No Change to Text.* |
| Uranium | *No Change to Text.* |

**Appendix 64465-D. Health Effects Language**

**Inorganic Contaminants~~.~~**

| ***Contaminant*** | ***Health Effects Language*** |
|---|---|
| Aluminum | *No Change to Text.* |
| Antimony | *No Change to Text.* |
| Arsenic | *No Change to Text.* |
| Asbestos | *No Change to Text.* |
| Barium | *No Change to Text.* |
| Beryllium | *No Change to Text.* |
| Cadmium | *No Change to Text.* |
| Chromium | *No Change to Text.* |
| Copper | *No Change to Text.* |
| Cyanide | *No Change to Text.* |
| Fluoride | *No Change to Text.* |
| Lead | *No Change to Text.* |
| Mercury | *No Change to Text.* |
| Nickel | *No Change to Text.* |
| Nitrate | *No Change to Text.* |
| Nitrite | *No Change to Text.* |
| Perchlorate | *No Change to Text.* |
| Selenium | *No Change to Text.* |
| Thallium | *No Change to Text.* |

## Appendix 64465-E. Health Effects Language

### Volatile Organic Contaminants~~.~~

| ***Contaminant*** | ***Health Effects Language*** |
|---|---|
| Benzene | *No Change to Text.* |
| Carbon Tetrachloride | *No Change to Text.* |
| 1,2-Dichlorobenzene | *No Change to Text.* |
| 1,4-Dichlorobenzene | *No Change to Text.* |
| 1,1-Dichloroethane | *No Change to Text.* |
| 1,2-Dichloroethane | *No Change to Text.* |
| 1,1-Dichloroethylene | *No Change to Text.* |
| cis-1,2-Dichloroethylene | *No Change to Text.* |
| trans-1,2-Dichloroethylene | *No Change to Text.* |
| Dichloromethane | *No Change to Text.* |
| 1,2-Dichloropropane | *No Change to Text.* |
| 1,3-Dichloropropene | *No Change to Text.* |
| Ethylbenzene | *No Change to Text.* |
| Methyl-tert-butyl ether | *No Change to Text.* |
| Monochlorobenzene | *No Change to Text.* |
| Styrene | *No Change to Text.* |
| 1,1,2,2-Tetrachloroethane | *No Change to Text.* |
| Tetrachloroethylene | *No Change to Text.* |
| 1,2,4-Trichlorobenzene | *No Change to Text.* |
| 1,1,1,-Trichloroethane | *No Change to Text.* |
| 1,1,2-Trichloroethane | *No Change to Text.* |
| Trichloroethylene (TCE) | *No Change to Text.* |
| Toluene | *No Change to Text.* |
| Trichlorofluoromethane | *No Change to Text.* |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | *No Change to Text.* |
| Vinyl Chloride | *No Change to Text.* |

| | |
|---|---|
| Xylenes | *No Change to Text.* |

## Appendix 64465-F. Health Effects Language

## Synthetic Organic Contaminants~~.~~

| *Contaminant* | *Health Effects Language* |
|---|---|
| 2,4-D | *No Change to Text.* |
| 2,4,5-TP (Silvex) | *No Change to Text.* |
| Alachlor | *No Change to Text.* |
| Atrazine | *No Change to Text.* |
| Bentazon | *No Change to Text.* |
| Benzo(a)pyrene [PAH] | *No Change to Text.* |
| Carbofuran | *No Change to Text.* |
| Chlordane | *No Change to Text.* |
| Dalapon | *No Change to Text.* |
| Dibromochloropropane (DBCP) | *No Change to Text.* |
| Di (2-ethylhexyl) adipate | *No Change to Text.* |
| Di (2-ethylhexyl) phthalate | *No Change to Text.* |
| Dinoseb | *No Change to Text.* |
| Dioxin (2,3,7,8-TCDD)~~:~~ | *No Change to Text.* |
| Diquat | *No Change to Text.* |
| Endothall | *No Change to Text.* |
| Endrin | *No Change to Text.* |
| Ethylene dibromide (EDB) | *No Change to Text.* |
| Glyphosate | *No Change to Text.* |
| Heptachlor | *No Change to Text.* |
| Heptachlor epoxide | *No Change to Text.* |
| Hexachlorobenzene | *No Change to Text.* |
| Hexachlorocyclopentadiene | *No Change to Text.* |
| Lindane | *No Change to Text.* |

| | |
|---|---|
| Methoxychlor | *No Change to Text.* |
| Molinate (Ordram) | *No Change to Text.* |
| Oxamyl [Vydate]~~:~~ | *No Change to Text.* |
| PCBs [Polychlorinated biphenyls]~~:~~ | *No Change to Text.* |
| Pentachlorophenol | *No Change to Text.* |
| Picloram | *No Change to Text.* |
| Simazine | *No Change to Text.* |
| Thiobencarb | *No Change to Text.* |
| Toxaphene | *No Change to Text.* |
| <u>1,2,3-Trichloropropane</u> | <u>Some people who drink water containing 1,2,3-trichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.</u> |

**Appendix 64465-G. Health Effects Language**

**Disinfection Byproducts, Byproduct Precursors, and Disinfectant Residuals**

| ***Contaminant*** | ***Health Effects language*** |
|---|---|
| TTHMs [Total Trihalomethanes]~~:~~ | *No Change to Text.* |
| Haloacetic Acids | *No Change to Text.* |
| Bromate | *No Change to Text.* |
| Chloramines | *No Change to Text.* |
| Chlorine | *No Change to Text.* |
| Chlorite | *No Change to Text.* |
| Chlorine dioxide (2 consecutive daily samples at the entry point to the distribution system that are greater than the MRDL) | *No Change to Text.* |
| Chlorine dioxide (one or more distribution system samples are | *No Change to Text.* |

| | |
|---|---|
| above the MRDL~~.~~) | |
| Control of DBP precursors (TOC) | *No Change to Text.* |

**Appendix 64465-H. Health Effects Language**

**Other Treatment Techniques**

| ***Contaminant*** | ***Health Effects language*** |
|---|---|
| Acrylamide | *No Change to Text.* |
| Epichlorohydrin | *No Change to Text.* |

NOTE: Authority cited: Sections 116271, 116325, 116350 and 116375, Health and Safety Code. Reference: Section 116450, Health and Safety Code.

**TITLE 22, CALIFORNIA CODE OF REGULATIONS**
**DIVISION 4, CHAPTER 15, ARTICLE 20**

## (6) Amend Section 64481 to read as follows:

### § 64481. Content of the Consumer Confidence Report.

(a) through (m) *No Change to Text.*

**Appendix 64481-A.**

**Typical Origins of Contaminants with Primary MCLs, MRDLs, Regulatory Action Levels, and Treatment Techniques**

*Contaminant* — *Major origins in drinking water*

***Microbiological***

| | |
|---|---|
| Total coliform bacteria | *No Change to Text.* |
| Fecal coliform and *E. coli* | *No Change to Text.* |
| Turbidity | *No Change to Text.* |

***Surface water treatment***

| | |
|---|---|
| *Giardia lamblia* | *No Change to Text.* |
| Viruses | |
| Heterotrophic plate count bacteria | |
| *Legionella* | |
| *Cryptosporidium* | |

***Radioactive***

| | |
|---|---|
| Gross Beta particle activity | *No Change to Text.* |
| Strontium-90 | *No Change to Text.* |
| Tritium | *No Change to Text.* |
| Gross Alpha particle activity | *No Change to Text.* |
| Combined ~~r~~Radium 226/228 | *No Change to Text.* |

| | |
|---|---|
| Total Radium (for nontransient noncommunity water systems) | *No Change to Text.* |
| Uranium | *No Change to Text.* |

***Inorganic***

| | |
|---|---|
| Aluminum | *No Change to Text.* |
| Antimony | *No Change to Text.* |
| Arsenic | *No Change to Text.* |
| Asbestos | *No Change to Text.* |
| Barium | *No Change to Text.* |
| Beryllium | *No Change to Text.* |
| Cadmium | *No Change to Text.* |
| Chromium | *No Change to Text.* |
| Copper | *No Change to Text.* |
| Cyanide | *No Change to Text.* |
| Fluoride | *No Change to Text.* |
| Hexavalent chromium | *No Change to Text.* |
| Lead | *No Change to Text.* |
| Mercury | *No Change to Text.* |
| Nickel | *No Change to Text.* |
| Nitrate | *No Change to Text.* |
| Nitrite | *No Change to Text.* |
| Perchlorate | *No Change to Text.* |
| Selenium | *No Change to Text.* |
| Thallium | *No Change to Text.* |

***Synthetic organic***

| | |
|---|---|
| 2,4-D | *No Change to Text.* |
| 2,4,5-TP (Silvex) | *No Change to Text.* |
| Acrylamide | *No Change to Text.* |

| | |
|---|---|
| Alachlor | *No Change to Text.* |
| Atrazine | *No Change to Text.* |
| Bentazon | *No Change to Text.* |
| Benzo(a)pyrene [PAH] | *No Change to Text.* |
| Carbofuran | *No Change to Text.* |
| Chlordane | *No Change to Text.* |
| Dalapon | *No Change to Text.* |
| Dibromochloropropane (DBCP) | *No Change to Text.* |
| Di(2-ethylhexyl) adipate | *No Change to Text.* |
| Di(2-ethylhexyl) phthalate | *No Change to Text.* |
| Dinoseb | *No Change to Text.* |
| Dioxin [2,3,7,8-TCDD] | *No Change to Text.* |
| Diquat | *No Change to Text.* |
| Endothall | *No Change to Text.* |
| Endrin | *No Change to Text.* |
| Epichlorohydrin | *No Change to Text.* |
| Ethylene dibromide (EDB) | *No Change to Text.* |
| Glyphosate | *No Change to Text.* |
| Heptachlor | *No Change to Text.* |
| Heptachlor epoxide | *No Change to Text.* |
| Hexachlorobenzene | *No Change to Text.* |
| Hexachlorocyclo-**[delete this hyphen]**pentadiene | *No Change to Text.* |
| Lindane | *No Change to Text.* |
| Methoxychlor | *No Change to Text.* |
| Molinate [Ordram] | *No Change to Text.* |
| Oxamyl [Vydate] | *No Change to Text.* |
| Pentachlorophenol | *No Change to Text.* |
| Picloram | *No Change to Text.* |
| Polychlorinated biphenyls [PCBs] | *No Change to Text.* |

| | |
|---|---|
| Simazine | *No Change to Text.* |
| Thiobencarb | *No Change to Text.* |
| Toxaphene | *No Change to Text.* |
| 1,2,3-Trichloropropane | Discharge from industrial and agricultural chemical factories; leaching from hazardous waste sites; used as cleaning and maintenance solvent, paint and varnish remover, and cleaning and degreasing agent; byproduct during the production of other compounds and pesticides. |

***Volatile organic***

| | |
|---|---|
| Benzene | *No Change to Text.* |
| Carbon tetrachloride | *No Change to Text.* |
| 1,2-Dichlorobenzene | *No Change to Text.* |
| 1,4-Dichlorobenzene | *No Change to Text.* |
| 1,1-Dichloroethane | *No Change to Text.* |
| 1,2-Dichloroethane | *No Change to Text.* |
| 1,1-Dichloroethylene | *No Change to Text.* |
| cis-1,2-Dichloroethylene | *No Change to Text.* |
| trans-1,2-Dichloroethylene | *No Change to Text.* |
| Dichloromethane | *No Change to Text.* |
| 1,2-Dichloropropane | *No Change to Text.* |
| 1,3-Dichloropropene | *No Change to Text.* |
| Ethylbenzene | *No Change to Text.* |
| Methyl-tert-butyl ether (MTBE) | *No Change to Text.* |
| Monochlorobenzene | *No Change to Text.* |
| Styrene | *No Change to Text.* |
| 1,1,2,2-Tetrachloroethane | *No Change to Text.* |
| Tetrachloroethylene (PCE) | *No Change to Text.* |
| 1,2,4-Trichlorobenzene | *No Change to Text.* |

| | |
|---|---|
| 1,1,1-Trichloroethane | *No Change to Text.* |
| 1,1,2-Trichloroethane | *No Change to Text.* |
| Trichloroethylene (TCE) | *No Change to Text.* |
| Toluene | *No Change to Text.* |
| Trichlorofluoromethane | *No Change to Text.* |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | *No Change to Text.* |
| Vinyl chloride | *No Change to Text.* |
| Xylenes | *No Change to Text.* |

**Appendix 64481-B.**

**Typical Origins of Contaminants with Secondary MCLs**

| *Contaminant* | *Major origins in drinking water* |
|---|---|
| Aluminum | *No Change to Text.* |
| Color | *No Change to Text.* |
| Copper | *No Change to Text.* |
| Foaming Agents (MBAS) | *No Change to Text.* |
| Iron | *No Change to Text.* |
| Manganese | *No Change to Text.* |
| Methyl-tert-butyl ether (MTBE) | *No Change to Text.* |
| Odor---Threshold | *No Change to Text.* |
| Silver | *No Change to Text.* |
| Thiobencarb | *No Change to Text.* |
| Turbidity | *No Change to Text.* |
| Zinc | *No Change to Text.* |
| Total dissolved solids | *No Change to Text.* |
| Specific Conductance | *No Change to Text.* |
| Chloride | *No Change to Text.* |
| Sulfate | *No Change to Text.* |

NOTE: Authority cited: Sections 116271, 116350 and 116375, Health and Safety Code. Reference: Sections 116275 and 116470, Health and Safety Code.