



Staff Report of the
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

FOR
THE CONTROL OF SALT AND BORON DISCHARGES
INTO THE SAN JOAQUIN RIVER
ISSUE SUMMARY AND RESPONSES



January 2004

Interested parties have raised a number of important issues during development of the draft Total Maximum Daily Load (TMDL) for the control of salt and boron discharges into the Lower San Joaquin River (LSJR) and the draft staff report for the Basin Plan Amendment that implements the TMDL. An informational workshop on the draft Basin Plan Amendment was part of the December 2003 Regional Board meeting. Following is a list of the major issues raised in comment letters and at this workshop. The list is followed by description of the issues and staff's responses.

1. TMDL should propose water quality objectives upstream of Vernalis
2. Use of New Melones Reservoir for dilution is unreasonable use of water
3. TMDL fails to consider flow
4. TMDL should consider groundwater control
5. TMDL should use concentration-based approach
6. Technical basis is not sound (source analysis, models, etc.)
7. Proposed implementation lacks specificity
8. Options identified for implementing U.S. Bureau of Reclamation's load allocations are inappropriate
9. Timeline for implementation is unreasonable
10. Timely Completion of TMDLs

1. TMDL Should Propose Water Quality Objectives Upstream of Vernalis

Issue:

Both South Delta and environmental interests argue that new water quality objectives should be proposed for the SJR upstream of Vernalis as part of this TMDL. This argument is consistent with direction given the Regional Board in the State Water Board's Water Rights Decision 1641 (D-1641) directing the Regional Board "*promptly to develop and adopt water quality objectives and a program of implementation for the main stem of the San Joaquin River upstream of Vernalis. As part of its implementation plan for the salinity objectives, the Central Valley RWQCB should evaluate a program to regulate the timing of agricultural discharges to the San Joaquin River.*"

Response:

Establishment of new water quality objectives was excluded from the initial phase of the TMDL by design so that significant improvements in water quality could be achieved without further delay. The Basin Plan Amendment staff report describes the phasing of this TMDL (page 34). This section of the report explains that water quality objectives will be proposed as part of a Basin Plan amendment that is concurrently being developed. It further explains that methods adopted in this initial phase of the TMDL will be applied to implement these new objectives, when adopted. Not yet explained in the report is the rationale for this phasing.

Staff believes phasing is appropriate because establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult; this difficulty would likely result in delayed adoption of this TMDL. Such a delay may be unacceptable to downstream and environmental interests and the U.S. EPA (see issue #10 regarding

timely completion of TMDLs. Establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult because of issues related to use attainability as defined in the Clean Water Act. In particular, hydromodifications that contribute to extremely low and no flow conditions make attainability of objectives established to protect beneficial uses potentially difficult or impossible. The Regional Board cannot afford to delay adoption of TMDLs while conducting a use attainability analysis, a process that could take three to five years. In the interim, the initial phase of this TMDL would provide the framework for how new water quality objectives would be implemented. The TMDL represents an important first step toward improving salinity conditions in the LSJR.

This first phase is consistent with D-1641 because the TMDL recognizes that U.S. Bureau of Reclamation (USBR) operations have significantly impacted salinity conditions in the LSJR and places full responsibility on the USBR for the salts imported to the LSJR watershed through the Delta Mendota Canal (DMC). The first phase is therefore “front-loaded” since water quality impacts of the impaired water supply must be fully mitigated now. This, however, will not provide relief to the City of Stockton, Stockton East Water District, and others interested in a water supply from New Melones Reservoir since the USBR could still use New Melones water to mitigate for their contribution to the salinity problem (see issue #2 regarding releases from New Melones Reservoir).

In response to comments, staff will make clear in the executive summary and proposed Basin Plan language, the phased nature of the TMDL and program of implementation. Also in response to comments, staff will develop a timeline for proposing new water quality objectives and include this timeline in the proposed Basin Plan amendment language.

2. Use of New Melones Reservoir for Dilution is Unreasonable Use of Water

Issue:

Downstream interests such as Stockton East Water District have indicated that the USBR’s use of New Melones water to dilute SJR water, as a means of meeting water quality objectives at Vernalis, is an unreasonable use of water that prevents them from using this water. These interests correctly assert that the State Water Board directed the Regional Board to promptly develop and adopt salinity objectives and a program of implementation for the San Joaquin River upstream of Vernalis (see issue #1 regarding water quality objectives). It is presumed that establishment of such objectives would reduce the quantity of water that would need to be released from New Melones because water quality objectives would already be attained upstream of the Stanislaus River confluence (presuming also that proposed objectives would be the same as the Vernalis objective). This would make New Melones water available to fulfill contractual entitlements to this water.

Response:

Staff is currently developing water quality objectives upstream of Vernalis but is proposing to implement the first phase of the TMDL which implements only the existing

salinity water quality objectives (see issue #1 regarding water quality objectives). The State Water Board's D-1641 assigns the USBR full responsibility to meet the Vernalis salinity objective in the southern Delta. D-1641 provides the USBR with latitude in meeting the Vernalis salinity water quality objective, however, the USBR has, to date, used New Melones water as the only mechanism for meeting the Vernalis water quality objective. Load limits proposed in the TMDL will reduce, but not eliminate, the quantity of water that would be needed to meet the Vernalis water quality objective through dilution of SJR water. The Regional Board cannot require use of any specific methods to comply with effluent limits. Similarly, the Regional Board cannot exclude the use of any proposed method to comply with the load allocations so long as the methods do not contribute to degrading water quality. Furthermore, the Regional Board has no authority with regard to flow or water rights. Issues related to flow and water rights are the purview of the State Water Board, through its Division of Water Rights.

3. TMDL Fails to Consider Flow

Issue:

Environmental interests, including DeltaKeeper and the Natural Resources Defense Counsel (NRDC), contend that a number of water quality problems in the LSJR could be corrected by increasing flows in the LSJR. Environmental interests also contend that part of the solution to the salinity problem is to allow LSJR irrigators to use higher quality Friant water and let South San Joaquin Valley irrigators use Delta water.

Response:

Staff agrees that water quality would be improved if additional fresh water supplies were made available, thereby providing additional dilution of salts and increased salt loading capacity. The Regional Board, however, has no authority with regard to flow or water rights. Issues related to flow and water rights are the purview of the State Water Board, through its Division of Water Rights. Staff has, per State Water Board direction, developed a program that focuses on controllable discharges to the LSJR. Control of salt and boron discharges alone, however, will not result in achievement of water quality objectives at all times. Staff could add policy statements to the Basin Plan requesting State Water Board to continue to use its water rights authority to prohibit water transfers if they contribute to water quality impairments and to continue to condition water rights on the attainment of salinity water quality objectives when these objectives cannot be met through drainage controls alone.

4. TMDL Should Consider Groundwater Control

Issue:

Environmental interests are concerned that the proposed implementation program does not include a groundwater control program despite identification of groundwater accretions as a major contributor to impairment.

Response:

Staff acknowledges that groundwater is a significant source of salt loading to the LSJR. The proposed TMDL includes estimates of groundwater loading to the LSJR so that loading capacity for surface water discharges can be determined. Explicitly allocating

loads to groundwater sources and developing a control program to meet such allocations through this TMDL, however, would be complicated and require much additional data and modeling of the LSJR Basin groundwater system. The difficulties in setting allocations for groundwater salt loads include: 1) differentiating natural salt from anthropogenic salt; 2) identifying responsibility for groundwater that underlies large tracts of land under multiple ownerships and land uses; and 3) determining the linkage between application of water (and salt) to land, groundwater recharge, and groundwater pumping. The information needed to answer these questions is not currently available and obtaining the needed information would delay adoption and implementation of this TMDL for many years.

Indirect groundwater control has, however, already been incorporated into the proposed TMDL. An additional load allocation has been provided to the Grasslands and Northwest Side Subareas to account for the local impact of degraded Central Valley Project (CVP) supply water. The CVP supply water credit is set equal to 50 percent of the salts delivered in CVP supply water because not all of the imported salts are discharged in agricultural drainage; some salts are stored in soil or contribute to groundwater. The USBR is required to mitigate for the entire load in CVP supply water in excess of a base load for an equivalent volume of Sierra Nevada quality water. The USBR's responsibility is therefore much larger than the supply CVP supply water credit granted to westside agriculture and wetlands. The difference between the CVP supply water credit and the USBR's responsibility is intended to mitigate for the salts in supply water that contribute to groundwater degradation and are eventually discharged to the LSJR through uncontrolled groundwater accretions.

5. TMDL Should Use Concentration-Based Approach

Issue:

Turlock Irrigation District (TID), representing east side agricultural interests, suggest using a concentration-based approach because it would be much simpler, more equitable, and more certain to provide positive results. Under the TID proposal, any discharge at or below the Vernalis salinity water quality objectives would be allowed. TID representatives have also suggested that use of supply water credits and the load-based approach is flawed because loads are over allocated.

Response:

The proposed TMDL already has a concentration-based element; all discharges below a trigger value of 315 μ S/cm electrical conductivity would be unrestricted. The primary difference between the TID proposal and draft TMDL is the trigger value at which discharges are unrestricted (not subject to the TMDL). Under the TID proposal the trigger value would be set equal to the seasonal salinity water quality objectives at Vernalis (700 μ S/cm April through August, 1000 μ S/cm September through March).

The trigger value contained in the TMDL is based upon the expected discharge water quality from a non-point source that receives an excellent quality (low salt) supply water. Though a technical basis for the trigger value is provided in Appendix 1 of the staff report (pages 1-62 and 1-63), selection of an appropriate trigger value is ultimately a

judgment call that will shape which dischargers will be affected by the TMDL. Raising the trigger value will, in general, provide less incentive to reduce water quality degradation because more entities will have discharges with concentrations below the trigger value. Conversely, lowering the trigger value will, in general, provide greater incentive to reduce water quality degradation because more entities will have discharge with concentrations above the trigger value. Selection of a trigger value at or just below the water quality objective provides little or no incentive to reduce non-point source loading from areas that receive high quality supply water. For example, discharges receiving irrigation supply water below $85\mu\text{S}/\text{cm}$ would be allowed to discharge water at 700 to $1000\mu\text{S}/\text{cm}$. Setting the trigger value well below the water quality objective places responsibility on dischargers that use and degrade high quality water.

A purely concentration-based approach that allows discharge of unlimited salt loads so long as the water quality objective is met would have numerous adverse consequences. Allowing discharge of water that has a concentration equal to the water quality objective would also not be consistent with State Water Board Resolution No. 68-16 (“Statement of Policy With Respect to Maintaining High Quality Waters in California”), the so-called “anti-degradation policy.” A concentration-based approach would shift the majority of the responsibility for reducing salt and boron loading to the west side of the San Joaquin River. Under this approach, drainage from much of the west side would be prohibited from discharging at all times. Such a prohibition of discharge would likely lead to a salt build-up and exacerbate groundwater salinity problems. Additionally, allowing unrestricted discharges of water below the water quality objective will not result in compliance with salinity water quality objectives because uncontrolled groundwater accretions exceed the water quality objectives. Mixing poor quality groundwater with water at the water quality objective results in a quality that is above the water quality objective. Staff, therefore, disagrees with TID’s recommendation to use a purely concentration-based approach.

Contrary to information presented at the December 2003 Regional Board workshop, the proposed load allocations are correctly designed to meet the Vernalis water quality objectives to the extent they can be met through drainage controls alone. Examples provided by TID representatives incorrectly suggest that loads are over allocated in the TMDL. Contrary to examples provided by TID, provision of supply water credits for west side agriculture in the Northwest Side subarea does not over allocate loads. Supply water credits are equal to only half of the salt load that is removed by west side agriculture through surface water diversions. Subtraction of this significant salt load (in surface water diversions) was not accounted for in the TID analysis. Staff will respond to any such misunderstanding of the TMDL methods in the response to comments.

6. Technical Basis Is Not Sound (Source Analysis, Models, Etc.)

Issue:

The USBR asserts that a number of technical components of the TMDL are flawed:

- a) Concentration of 52 mg/L should not be used to determine baseline salt loads or concentration of westside discharges
- b) CALSIM2 model should be used instead of DWRSIM
- c) Mean or median design flow should be used rather than low flow
- d) Sources of salt loading were not thoroughly reviewed and the apparent arbitrary determination that the salt loading from the west side under baseline conditions is insignificant

Response:

a) Salinity of 52mg/L (approximately 85 $\mu\text{S}/\text{cm}$) is used throughout the staff report to represent background salt loading attributable to high quality surface water sources from the Sierra-Nevada Mountains. It is based on long-term historic electrical conductivity records for high flow conditions in the Merced, Stanislaus, and Tuolumne Rivers. Background salt loading for the Northwest Side Subarea (Coast Range) was estimated using flow and water quality data from upper Orestimba Creek. Groundwater background loads, at much higher salt concentrations, are also described in the staff report. Estimates of background loading and groundwater loading are primarily used to determine the available or allocatable salt loads (e.g. background and groundwater loads are subtracted from assimilative capacity; assimilative capacity is calculated using flow data applied to the appropriate salinity objective). The 52 mg/L concentration is also used to represent the salinity of the SJR downstream of Friant Dam; this is the approximate water quality that would have been delivered to downstream agriculture if the Central Valley Project had not been constructed. The USBR's DMC load allocation (allowable salt import) has therefore been set equal to the volume of water delivered to the LSJR watershed at a water quality of 52 mg/L. The affect of using background salinity higher than 52 mg/L would be to:

- reduce the assimilative capacity and therefore allocations at all times
- decrease the responsibility of the USBR for the impact of DMC imports on SJR water quality

b) The proposed TMDL method relies on the use of design flows for determining LSJR assimilative capacity during different months and water years. The design flows for this TMDL are based on results of the California Department of Water Resources (DWR) DWRSIM model output for CALFED Study 771. The USBR is concerned with the use of the DWRSIM model for the development of TMDL design flows and alternately suggest using CALSIM2 (a newer model) instead of DWRSIM. The CALSIM2 studies needed for this TMDL, however, were not available at the time these analyses were conducted, necessitating use of DWRSIM. CALSIM2, however, did not make major changes to the methods used to generate SJR hydrology so differences in model output between the two models are likely small. Subsequent comparison of DWRSIM and CALSIM2 output indicate that the use of CALSIM2 for developing TMDL design flows would not result in

appreciable differences from the proposed TMDL. Furthermore, the CALSIM2 model is still under development and recent technical reviews have identified a number of concerns with the model. The proposed TMDL is consistent with State Water Board Decision 1641 which also relied on the use of DWRSIM.

c) To protect water quality during low flow conditions, TMDL base load allocations are based on the lowest modeled flow on record for a given month and water year type. This provides an implicit margin of safety. The USBR suggests using the mean or median flow instead of the low flow. Use of the mean or median flow, however, would result in load allocations that exceed water quality objectives approximately 50 percent of the time. A TMDL designed to result in exceeding water quality objectives 50 percent of the time is not appropriate and unlikely to be approved by the U.S. EPA. Instead, the TMDL includes opportunities to use real-time load allocations in lieu of the conservative fixed base load allocation in order to provide relief to discharges and maximize the amount of salt that can be exported from the basin while still meeting water quality objectives. This approach establishes a stringent base load allocation that will protect water quality and, as an alternative, offers a relaxed real-time load allocation to dischargers that have the ability to adaptively manage their discharges.

d) The source analysis conducted for this TMDL was exhaustive, using a combination of historical and model generated data. One of two major concerns raised by the USBR is “the lack of thorough review for all sources of salt loading and the apparent arbitrary determination that the salt loading from the west side under baseline conditions is insignificant.” The purpose of the source analysis is to provide information on the relative contribution of background and controllable sources so that allocations can be determined for controllable sources. It is not the purpose of the source analysis to provide a definitive study of all sources. The two University of California peer reviewers for this TMDL responded that the method described in the report for deriving the TMDL appears to be reasonable and that the report adequately supports the methods used for deriving the allocations.

7. Proposed Implementation Lacks Specificity

Issue:

Environmental interests are concerned that regulatory mechanisms proposed to implement the control program lack specificity. Particularly, they are concerned that no specifics are provided in the proposed Basin Plan amendment for what would be contained in waste discharge requirements or waivers of waste discharge requirements. East side agricultural interests are concerned that there are insufficient details provided regarding implementation of real time allocations.

Response:

The purpose of the proposed amendment to the basin plan is to identify (1) the process that will be used to allocate loads so that water quality objectives can be implemented and (2) the regulatory mechanisms that will be used to implement the allocations. This TMDL, if adopted and incorporated into the Basin Plan, will provide the framework upon which pollutants discharged from multiple point, nonpoint, and background sources, can

be successfully regulated. This control program proposes several major elements, none of which could be readily addressed through issuance of individual permits, such as waste discharge requirements. These include:

- Fixed base load allocations for nonpoint source discharges
- A method for calculating real-time load limits and a method for allocating these loads to nonpoint source dischargers
- Prioritization, by subarea for implementing load allocations and a time schedule for implementing these allocations
- A method for calculating load allocations for salt imported into the LSJR

No individual Board actions, such as a general permit with salt load allocations for a specific geographic area, can be taken until this TMDL is adopted. The significance of the proposed regulation is that it concurrently addresses numerous salinity management issues. Given the scope of the proposed regulation, addition of specificity with regard to future general permits or waiver conditions would be premature at this time. This is a proposed change to a planning document, the Basin Plan. The Basin Plan will provide the framework upon which specific terms of waste discharge requirements and waivers of waste discharge requirements can be based. This applies to both establishment of fixed allocations and real-time allocations, as appropriate.

8. Options Identified for Implementing USBR's Load Allocations are Inappropriate

Issue:

Staff has proposed the use of a Management Agency Agreement (MAA) to work with the USBR to develop a means for the USBR to either meet DMC load allocations or to provide mitigation for the salt loads imported via the DMC. The use of waste discharge requirements is proposed if an MAA is not established within two years. Environmental and downstream interests have both indicated that the use of an undefined MAA is inappropriate and that the Regional Board "should take action now." It was also suggested by Westside agricultural interests that any schedule to develop or implement an MAA with the USBR be tied to the State Water Board direction to the USBR to report, in five years, to the Division of Water Rights "*all activities that were taken in attempting to meet the objectives, including out-of-valley alternatives.*" The five years will end 29 December 2004. The USBR has indicated that the Regional Board has no legal authority to regulate discharges of irrigation supply water to the San Joaquin River Basin under waste discharge requirements.

Response:

Staff agrees that the terms of the proposed MAA are undefined at this time, just as there is no specificity in terms of proposed waste discharge requirements or waivers of waste discharge requirements. See the response for issue #7 for the reasons no specificity is proposed at this time. The proposed control program identifies two broad mechanisms with which to implement the USBR's mitigation for their contribution to the problem. If an MAA is the approach used to regulate the USBR, staff will need two years to develop the terms of this agreement.

The Regional Board does have authority to regulate USBR's discharges to the San Joaquin River. Congress has waived sovereign immunity under both Section 8 of the Reclamation Act and Section 313 of the Clean Water Act. The Regional Board may therefore issue waste discharge requirements to the USBR to address discharges of waste to waters of the state and the State Water Board can address water quality issues in waters rights permits pursuant to the California Water Code. For example, the Regional Board has issued waste discharge requirements to the USBR to address selenium discharges in the Grassland Basin. The Regional Board issued waste discharge requirements to the Grassland Bypass Project (see Order No. 5-01-234 Waste Discharge Requirements for San Luis & Delta-Mendota Water Authority and United States Department of the Interior Bureau of Reclamation Grassland Bypass Project (Phase II) Fresno and Merced Counties) and issued an NPDES permit for previous activities at Kesterson Reservoir.

9. Timeline for Implementation is Unreasonable

Issue:

West side agricultural interests have commented that the time frame provided for implementation is too short. They have indicated that timelines are not consistent with other programs such as the selenium control program which has a timetable of 15 years from adoption of the Basin Plan to complete compliance. Particularly, there is concern that less time is provided in the draft staff amendment for implementing allocations for the highest concentration and load sources, which will have to implement the largest reductions. West side agricultural interests have suggested reversing the priority for compliance with load allocations by requiring that the lowest priority sub-areas meet load allocations first. Environmental interests, however, have indicated that the eight to 20 year timeline for compliance with load allocations is too long.

Response:

Setting appropriate time schedules for compliance with TMDL load allocations requires striking a balance between providing adequate time for dischargers to plan, finance, and implement effective water quality controls, and ensuring that water quality improvements occur as soon as possible. Under the proposed compliance schedule, high priority sub-areas (those with the greatest salt loading) would be required to meet load allocations in eight to 12 years, medium priority sub-areas would be required to meet load allocations in 12 to 16 years, and low priority (low threat) sub-areas would have 16 to 20 years to meet load allocations. Staff believes that the compliance time schedules proposed are achievable and that it is important to focus initial efforts on achieving compliance in the highest priority areas-- those that contribute the greatest salt loads. This approach has the added benefit of delaying implementation that would potentially reduce discharge of relatively higher quality water (one of the concerns of east side agriculture). This provides additional time to study the effect of reducing the volume of such discharges.

Staff concedes that a 16 to 20 year implementation time frame is long but that the extended time schedule is warranted given the complexity and magnitude of the salinity problem and given that the economic analysis indicates that substantial capital expenditure will be required to meet load allocations.

10. Timely Completion of TMDLs

Issue:

Downstream and environmental interests want action taken now, although they also want the scope of the current action to include: 1) new water quality objectives upstream of Vernalis and 2) the consideration of reduced flow (see issues #1 and #3). The U.S.EPA has also indicated to the Regional Board and State Water Board that they expect progress to be made in adopting TMDLs.

Response:

Delayed adoption of this and other TMDLs could put the Regional Board at risk of losing funds that support TMDL development. TMDLs, when developed and adopted, fulfill the State's obligation to implement the Clean Water Act; completion also facilitates the improvement of water quality in waters of the State. Use of federal money to develop TMDLs therefore assists the State in protecting water quality.

Lack of information, uncertainty, and partial solutions are not adequate justification for delaying completion and adoption of TMDLs. The Clean Water Act requires that TMDLs be developed with the best information available and that they can be phased, if necessary. This salinity control program is proposed to implement the first phase of a TMDL that will provide the initial regulation needed to implement the Vernalis water quality objective. It is a necessary first step that would be needed as part of any future groundwater control program or surface water quality control program to implement new objectives upstream of Vernalis. It should therefore not be delayed until such time that more information is available to fully implement a more comprehensive solution to salinity problems in the SJR Basin.