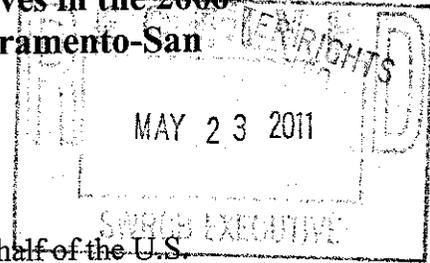


United States Department of the Interior

Comments on the Revised Notice of Preparation and Notice of Additional Scoping Meeting for the State Water Resources Control Board Review of the Southern Delta Salinity and San Joaquin River Flow Objectives in the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

May 23, 2011



The U.S. Department of the Interior (Interior) submits these comments on behalf of the U.S. Bureau of Reclamation (Reclamation) and the U.S. Fish and Wildlife Service (FWS), pursuant to the State Water Resources Control Board (SWRCB or the Board) April 1, 2011, Revised Notice of Preparation and Notice of Additional Scoping Meeting (Revised Notice). These comments are in addition to comments submitted by Interior on December 6, 2010 and February 8, 2011, and all other comments submitted by Interior in connection with the Board's review of the 2006 Water Quality Control Plan for the Bay-Delta relating to San Joaquin River Flow Objectives and Southern Delta Salinity Objectives.

I. Draft San Joaquin River Fish and Wildlife Flow Objectives

A. General Comments

At the outset, Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat. In fact, the San Joaquin Basin anadromous fish populations are at a critically low level. Therefore, Interior recommends that the SWRCB concentrate efforts in the early phases of implementation to ensure the rapid stabilization of anadromous fish populations.

As general propositions, Interior supports the Board's consideration of implementing the narrative salmon doubling goal as the guiding principle for flows on the San Joaquin and its tributaries. In addition, Interior firmly supports the addition of compliance stations on the tributaries, and believes that flow contributions from salmon bearing tributaries (Stanislaus, Tuolumne, and Merced) are key to ensuring a healthy ecosystem and equitable program of implementation. As noted in the Board's Revised Notice, the upper San Joaquin River does not currently support salmon runs upstream of the Merced River confluence. Therefore, Interior is also in favor of focusing the first stage of implementation on the current salmon bearing tributaries while allowing the reintroduction of salmon in the upper San Joaquin, as set forth in the San Joaquin River Restoration Program, to proceed.

Interior also supports the Board's use of adaptive management to refine the flow objective over time. However, Interior notes that "true" adaptive management is a scientific process dependent upon testing hypotheses by developing and monitoring measurable criteria for assessing the success or failure of the Board's regulatory regime, and allowing for modifications, over the long-run (see, e.g., Williams, B.K., R. C Szaro and C.D. Shapiro. 2007. Adaptive management: The

U.S. Department of Interior Technical Guide. Adaptive Management Working Group, U.S. Department of Interior, Washington, DC.). On an annual basis, we believe the Board is proposing to implement the objective through flexible flow schedules (not adaptive management, as denoted in the Revised Notice) to minimize water supply impacts, as described on page 4 of the Board's Revised Notice. It appears that the San Joaquin River Monitoring Evaluation Program (SJRMEP) is geared more toward adaptive management, while the coordinated operations group (COG), appears to be geared more toward informing flexible flow schedules. In any event, Interior supports the Board's consideration of both adaptive management and flexible flow schedules to achieve the salmon doubling goal.

Interior believes that the environmental analysis of the Board's draft San Joaquin River Flow objectives should include the identification of what proportion of unimpaired flow is needed to meet the salmon doubling goal and specifically what the flow objective is intended to achieve in terms of specific and measurable biological objectives. The environmental analysis should also evaluate and identify alternative programs of implementation that meet the biological goals and objectives as a baseline for balancing the water needs in the basin.

Also critical to the Board's environmental analysis is an accurate accounting of the basin's water supply, and the impacts to reservoir operations. Adequately analyzing impacts to large multi-purpose reservoir operations, specifically, New Melones Reservoir, is critical. As Interior has set forth before, New Melones is operated for, among other purposes, water supply, drought protection, flood control, power production, water quality, fish and wildlife, temperature controls, and recreation. If flow requirements take from one reservoir purpose, it will impact the reservoir's ability to meet the other purposes. Therefore, Interior believes it is essential that the Board analyze the impacts to storage, and reservoir purpose tradeoffs.

Such a tradeoff analysis is best accomplished through the use of a general investigations (GI) type model. An analysis with this type of model would look at general categories of water use on each stream and within each reservoir (e.g., fish, consumptive use, flood control, etc). In addition, this type of model could be used to determine impacts to various reservoir purposes over multiple years, including drought cycles. Interior will be working with the Board to ensure appropriate analytical methodologies are used throughout the environmental review process, especially on the Stanislaus, as well as commenting on the Board's analysis throughout the process.

B. Specific Comments

1. Biological Considerations

Interior supports the establishment of flow objectives in the mainstem San Joaquin River and the primary San Joaquin basin tributaries, as well as flow continuity through the Delta, that are sufficient to support the doubling of natural production of Chinook salmon from the average production of 1967-1991 and to support and maintain the natural production of viable native San Joaquin River fish populations migrating through the Delta. This recommendation is consistent with the Board's narrative salmon doubling goal and the doubling goals described in the Central Valley Project Improvement Act (CVPIA). Interior recognizes that the SWRCB is responsible for considering all basin-wide water uses in its analysis of potential modifications to the 2006

Bay-Delta Plan. In support of one of the primary noticed goals of "modifying flow objectives for the protection of fish and wildlife beneficial uses", the SWRCB should consider all flow-related salmonid life-cycle requirements to determine the appropriate level of unimpaired flow that is needed in the mainstem, tributaries, and Delta to achieve the stated doubling goal. Additionally, in Table 3 of the SWRCB's revised notice, it is stated that flow conditions shall be maintained, "together with other reasonably controllable measures...". It is unclear how "other reasonably controllable measures in the San Joaquin River" will be addressed. Interior recommends that the SWRCB identify the "other reasonably controllable measures" and clarify who will fund and enforce the control of these other measures.

Biological Objectives: Interior also recommends that the narrative salmon doubling goal be broken down into specific biological objectives that the flow objectives are intended to achieve, and if met could meet the salmon doubling goal. For example, one simple life-cycle model indicates 30% survival through the tributaries and 50% survival through the Delta is needed to meet the doubling goal in less than 30 years, given the starting juvenile production in 2010 and assuming average survival rates in other phases of the life-cycle (Interior, February 8, 2011 comments). Thus it is important to provide the flows that are hypothesized to meet these biological/survival objectives. In addition, it is imperative that these biological objectives are able to be monitored to evaluate the success or failure of the flow objectives to meet these biological objectives and to use the information to refine the flow objectives over time.

Model Development and Application: Interior suggests the development and use of conceptual and other types of models (e.g., empirical and life-cycle) to help determine the flows necessary to meet the biological objectives in the San Joaquin tributaries and Delta and achieve the Chinook salmon doubling goal. These models will be instrumental in an adaptive management framework and will be refined through the iterative adaptive management process with focused monitoring and special studies. Modeling flow objectives as a percent of unimpaired flow that mimics the natural hydrograph before implementation, monitoring the effects of implementing the flow objectives, and adjusting management actions appropriately will improve our capacity to meet the biological goals identified over the long term.

Tributary Share of Unimpaired Flow: Interior believes it is important to provide the needed flows for all life-stages of salmonids on each of the San Joaquin tributaries to meet the salmon doubling goals in each tributary, in addition to ensuring that those tributary flows reach Vernalis. With respect to the Stanislaus River, Interior currently is participating in ongoing monitoring and studies to evaluate fish needs.

Concurrent Regulatory Proceedings: Interior encourages the SWRCB to further clarify the relationship and integration that is expected to occur with the Federal Energy Regulatory Commission (FERC) hydropower relicensing processes on the Tuolumne River (2016 completion date) and Merced River (2014 completion date). It is unclear whether the SWRCB can or should rely solely on these FERC proceedings to establish San Joaquin tributary flows necessary to meet the salmon doubling goal throughout the San Joaquin, and into the Delta. As such, it is important that the SWRCB document the tributary flows needed to meet the salmon doubling goals in the Tuolumne and Merced Rivers during the FERC Section 401 certification process.

Compliance Locations: Interior supports compliance points being established at the confluence of the tributaries with the mainstem San Joaquin River. Implementation of those compliance points should be equitable, and the Board should take measures to ensure that the tributary flows reach Vernalis, and beyond.

Analytical Range: A broad range of San Joaquin River flow objectives (20 – 80% of unimpaired flow) needs to be analyzed to provide the flexibility to change initial flow objectives if they do not meet the biological objectives and goals. It will be difficult, initially, to determine the precise percentage of unimpaired flow that is needed to meet the biological objectives and goals because of the uncertainty associated with physical and biological interactions in the system. In addition, it is possible that the flow needed to meet the goals and objectives could change in the future as the result of climate change and other factors. It is also important to test and monitor a broad range of the percent of unimpaired flows to facilitate learning via the adaptive management process. As a starting point, alternatives should be based on the functional features of the natural hydrograph and a range of unimpaired flow volumes. Establishing a flow objective at a higher percentage of unimpaired flow than is initially required would allow for both phasing over time and experimentation within a range of unimpaired flows for the implementation of the adaptive management process. For example, if 60% of the unimpaired inflow was initially chosen as a flow objective, but only 40% was set as the initial flow objective, this level could be tested to determine if it met the objective. Conversely, if 60% was tested and found to result in exceeding the biological objectives, a lower percentage of unimpaired flow could be tested and if warranted, flow objectives could be reduced. This type of range in the percentage of the unimpaired flow adopted as a flow objective is needed in a truly adaptive management process. However, it must be stressed that monitoring must be in place and robust enough to detect differences in the biological objectives given the various percentages of unimpaired flow tested.

Year-round Flows to Meet Salmonid Life-stage Requirements: Year-round flows, including those in October, are needed on the three San Joaquin tributaries and the mainstem San Joaquin River through the Delta to meet salmonid life-stage requirements including: suitable attraction for adult upstream migration, spawning and rearing habitat, adequate juvenile outmigration flows, water quality, and temperature to meet the salmon doubling goal. It is likely that during prolonged drought sequences, using a percentage of the unimpaired flows will result in unsuitable conditions (e.g., water temperature, dissolved oxygen, etc.). During these times when specified proportions of unimpaired flow estimates are deemed insufficient to meet salmonid life-stage requirements, higher portions of unimpaired flow may be required for fish.

Water Exports: Exports levels should be part of a basin plan, especially when adaptive management is to be used to refine flow objectives. Assessing flow will be difficult without a structured design plan that includes export limitations. A range of exports (both Central Valley Project (CVP) and State Water Project (SWP) and other permitted diversions to the greatest extent possible) should be modeled when analyzing Vernalis flow alternatives.

Adaptive Management: Interior believes the SWRCB should use an adaptive management process in determining the flow objective as a percentage of unimpaired flow over the long-term.

An adaptive management approach needs to include modeling, hypothesis testing, and targeted monitoring and research with specific biological objectives and metrics with the intent to change the flow objectives if monitoring indicates initial flow objectives do not meet, or exceed, the biological objectives. In addition, a range of percentage of unimpaired flow for meeting the flow objective needs to be identified at the beginning of the process so that changes in management can be made relatively easily as the results of monitoring inform the process.

San Joaquin River Monitoring and Evaluation Program (SJRMEP) Monitoring: It is imperative that the SWRCB assure the necessary funding for multi-year monitoring and special studies at the scales necessary to obtain meaningful results for informing the adaptive management process. Interior recommends that an adaptive management planning group be created as part of the SJRMEP to guide the adaptive management process, including creation and/or refinement of life-cycle models, setting goals, planning monitoring, and creating testable hypotheses.

Coordinated Operations Group (COG): If the SWRCB establishes a COG, technical level staff from Reclamation, FWS, California Department of Water Resources, California Department of Fish and Game, , and the U.S. National Marine Fisheries Service, as well as technical staff from the San Joaquin River tributaries should be participants. The goals and objectives of the COG should be clearly articulated so the group can work in a cooperative manner to ensure the tributary flow objectives are implemented consistent with the SWRCB's Vernalis flow objectives in the long-term San Joaquin Basin Plan.

Geographic Scope of Impacts: Alterations to the regulated flow regimes of the mainstem San Joaquin River and its primary tributaries could potentially have system operations impacts statewide, considering the overlapping and coordinated management framework of the SWP, CVP, and, to a lesser extent, the major San Joaquin tributaries. Potentially impacted regions include, but are not limited to, the Sacramento-San Joaquin Delta, the Trinity River system, and areas receiving water exports from the Delta. These operational changes could, in turn, result in environmental impacts to aquatic resources that inhabit the watersheds affected by the various water storage and conveyance structures in each system. The SWRCB should consider adopting a holistic approach when analyzing the potential operational and environmental impacts of revising San Joaquin River flow and southern Delta salinity objectives to ensure a comprehensive evaluation of all interrelated management activities.

Riparian Vegetation: Riparian vegetation recruitment is limited within the San Joaquin basin due to geomorphic scour caused by sediment impoundment behind dams and constraining natural hydrologic variability preventing inundation of floodplain habitats. Recession rates of approximately 1 inch elevation per day administered intermittently during the spring and summer (once per 3-5 years) would allow for germination and growth of willows and cottonwoods, and should be an additional consideration for the flow objective. (See, Amlin, Nadine M. and S. B. Rood. 2002. Comparative tolerances of riparian willows and cottonwoods to water-table decline. *Wetlands* 22(2): 338-346.)

Water Temperature Impacts: The water temperature regimes of the mainstem San Joaquin River and its tributaries have been shown to be a limiting factor in salmonid production. Water

operations on the major dams and diversion structures directly affect downstream water temperatures by controlling flow volumes and release temperatures. Interior encourages the SWRCB to analyze the effects of any altered operations on the downstream thermal regime and to ensure compliance with existing water temperature standards, and if necessary, refine the thermal standards to coincide with the expected changes in flow patterns on the mainstem and the tributaries.

2. Water Supply Considerations

During its analysis of alternative flow objectives and alternative programs of implementation, the Board should consider that the San Joaquin River and its tributaries are impaired by numerous reservoirs, including many smaller power generating reservoirs in the upper elevations, and larger rim reservoirs. These reservoirs serve numerous purposes, including long-term drought protection, water supply, power generation, cold water pool reserves, and flood control. The result is that the San Joaquin and its tributaries have had managed flow patterns for decades. Therefore, a responsible analysis of San Joaquin River flow objectives necessarily includes an analysis of reservoir purposes, operations and reoperations.

Interior supports development of a program of implementation, which allows New Melones Reservoir to be operated in a sustainable manner over the long-term. New Melones Reservoir currently experiences overprescribed demands in many water years. The inflow to New Melones and storage yield are required for prior water rights holders, CVP contractors, fish flows, salinity control, temperature control, dissolved oxygen requirements, flood control, power, and recreation purposes. Given the oversubscribed nature of New Melones demands, Reclamation operators find it difficult to sustain usable New Melones storage yield in drought conditions.

Indexing flow objectives to water year type does not necessarily result in prudent reservoir operations. A wetter year following consecutive dry years may be the best year to conserve for future demands. Yet, a regulatory regime indexed only to water year type would generally require higher flows in such a year. Interior recommends that the Board model and evaluate reservoir impacts to drought planning in its alternative flow objective and program of implementation analysis, as they pertain to all project purposes, including fish and wildlife and water supply.

The Board should address the potential impacts to all federally authorized purposes of New Melones Reservoir, including water supply, fish and wildlife, flood control, power production, water quality, temperature controls, and recreation. Allocating storage yield of a multi-purpose reservoir is not the same thing as allocating annual natural or unimpaired flow of a stream. Allocating storage yield necessarily includes multi-year drought protection, carryover storage and refill potential as critical factors in developing a sustainable plan of operation. In short, Interior recommends that the Board recognize the reasons for which the reservoirs were built and look at the benefits and trade-offs (potential negative impacts) to those purposes. Finally, the Board needs to recognize that there is a trade-off between establishing spring Stanislaus River flows to meet fish and wildlife objectives and having the assurance of sufficient storage to meet fall temperature objectives for fish and wildlife.

Water supply considerations for the COG include: (1) reservoir operators are fully represented on the COG, (2) reservoir operators have certainty regarding the volume of water needed to meet fish and wildlife needs each year, and (3) multi-year adaptive management plans do not result in non-viable reservoir operations over the long-term especially during extended drought periods. It is recommended that the annual adaptive management plan not only consider inflow forecasts, but also carryover storage in decisions on tributary flow requirements.

The Revised Notice indicates that the Board will establish responsibility for development and implementation of the SJRMEP. Interior supports the establishment of the SJRMEP as a means of developing and implementing a science-based approach to providing for flows needed to achieve the fish doubling objective.

II. Draft Southern Delta Agriculture Water Quality Objectives

A. General Comments

The Board's Revised Notice states that, "elevated salinity in the southern Delta is caused by various factors, including low flows; salts imported to the San Joaquin Basin in irrigation water; municipal discharges; subsurface accretions from groundwater; tidal actions; diversions of water by the SWP, CVP, and local water users; channel capacity; and discharges from land-derived salts, primarily from agricultural drainage." Yet, the Board's Revised Notice identifies only the CVP and the SWP to implement the objectives. Interior is concerned that this conclusion, at this stage in the process, is premature and does not comport with the Board's stated finding, other established facts regarding causes of elevated salinity, and state and federal law.

B. Specific Comments

Due to the many variables that influence Delta hydrodynamics, it is difficult to determine the factors that control salinity in the southern Delta under certain conditions. Daily tidal cycles, operations of the SWP and CVP export pumps, temporary barriers, local diversions and discharges, flow management activities on the San Joaquin and Sacramento Rivers are just a few of the variables which must be considered when examining southern Delta salinity. Interior supports the use of the best available science by the Board as they embark in the difficult task to determine the salinity objectives that will provide reasonable protection to southern Delta agriculture. Interior requests that the Board make available the scientific studies and information relied upon by the Board to determine the following:

- Circulation and water levels are directly related to salinity levels in the southern Delta and thus appropriate metrics of and control variables for salinity management.
- The SWP and CVP are the only responsible parties for circulation and water level impacts to the southern Delta.
- The actions of the SWP and CVP are solely responsible for salinity impairment.
- Contributions of local diversions and discharges to southern Delta salinity are minor.
- Changes to the San Joaquin River flow regime from February through June will improve salinity in the southern Delta.

In addition to the questions listed above, Interior believes the Board needs to further explore and address the following issues related to the new flow management scheme that will be derived through this process.

- Using a percentage of unimpaired flow to manage ecosystem needs will most likely alter the salinity profile of the basin from historical conditions. How will the intensity, duration, and seasonality of the new salinity profile compare to historical? Will additional flows be needed to meet objectives? How will meeting the objective with the new profile impact storage compared to historical conditions?
- Will the new salinity profile create opportunities or obstacles to long term salinity control of the basin?
- Given that ecosystem needs and water quality needs are not conjunctive but competing uses, what is the total water cost to meet the ecosystem needs using a percentage of unimpaired flows and meeting water quality needs on an annual and multi-year basis?
- The issue of effective rainfall is an important variable to salinity crop tolerance as cited by Dr. Glen Hoffman. Does the Board plan to investigate the recommendations made by Dr. Hoffman?

The Board and the Central Valley Regional Water Quality Control Board, both within the Bay-Delta water quality control plan, and through their Central Valley Salinity Alternatives for a Long-Term Solution (CV-SALTS) process, are proponents of a real time management program in the Lower San Joaquin basin. In establishing the southern Delta salinity compliance objectives, the State Board must include opportunities for salinity management to occur. In order for any long-term salinity control strategy to be effective, a plan must include opportunities to export excess of salt out of basin and provide land owners the ability to discharge when conditions exist without jeopardizing beneficial uses. The State Board should consider relaxing the target from December through March to facilitate the export of salt during high flow conditions. This numeric target would be similar to the non-irrigation target for the three other interior compliance locations.

Interior also requests some clarifications to the proposed program of implementation:

1. How does the Board anticipate enforcing compliance along a "stretch" of river?
2. How will the Board define/quantify "circulation"? At what time scale and what unit of measurement?
3. How will null zone violations be measured? How many? When, and Where?
4. How will the southern Delta salinity objectives be enforced?
5. Who are the responsible parties for the null zones?
6. Who will pay for the additional studies and monitoring of the channels?

Southern Delta salinity issues are a component of the overall salinity problems in the Central Valley and the state. Its geographic location adds complexity to the problem and makes it difficult to determine the most effective means to manage elevated salinity in this region throughout the year and under different hydrologic conditions. The CV-SALTS initiative was established as a long term strategic planning effort to develop a comprehensive program to address salt management issues in the Central Valley. Interior recommends the Board place the southern

Delta salinity compliance issues under the CV-SALTS program where a more integrated solution can be developed that is consistent with actions contemplated for the Central Valley. CV-SALTS is currently engaged in many activities on the San Joaquin River that will effect salinity loads and flows such as:

- San Joaquin River at Vernalis Salt and Boron Total Maximum Daily Load program
- Upstream San Joaquin River Salinity objectives
- Grassland Bypass Program
- Westside Salt Assessment
- Real Time Management Program
- Wetland and Refuge operations
- Irrigated Lands Regulatory Program

Only by addressing the southern Delta salinity issues through a holistic approach, can a comprehensive and integrated salinity management plan be effective in protecting beneficial uses and sustainable for those responsible for implementation of the program. This approach is consistent with the Board's charge under California Water Code § 13241 (c), to consider "water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area," and not improperly burden only the CVP and SWP.