March 17, 2017

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
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Via e-mail

Subject: Comment Letter – 2016 Bay-Delta Plan Amendment and SED

Dear Ms. Townsend and the Members of the Board:

The California Sportfishing Protection Alliance (CSPA),[1] the California Water Impact Network (C-WIN),[2] and AquAlliance[3] appreciate the opportunity to comment on the *Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta: San Joaquin River Flows and Southern Delta Water Quality* (SED). This letter responds to the State Water Resources Control Board's (hereinafter "State Board" or "Board") September 15, 2016, *Notice of Filing and of Public Comment Period and Hearing on the Adequacy of the 2nd Draft Substitute Document in support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacrament/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality*.[4] This letter also responds to the Fourth Revised Notice ("Comment Deadline Extended and Reminder of Final Public Hearing Day"), issued December 22, 2016, which extends the deadline for commenting on the second (recirculated) SED to March 17, 2017.

CSPA, C-WIN, and AquAlliance welcomed the Board's decision to include in the administrative record of Phase I the workshop submissions that the Board received at the

[1] The California Sportfishing Protection Alliance (CSPA) is a 501(c)(3) non-profit public benefit conservation and research organization established in 1983 for the purpose of conserving, restoring, and enhancing the state's water quality, wildlife and fishery resources and their aquatic ecosystems and associated riparian habitats. To further these goals, CSPA actively seeks federal, state, and local agency implementation of environmental regulations and statutes and routinely participates in administrative, legislative and judicial proceedings. Where necessary, CSPA directly initiates enforcement actions on behalf of itself and its members to protect public trust resources.
[2] The California Water Impact Network (C-WIN) is a non-profit, tax exempt California Corporation that advocates for equitable and environmentally sensitive use of California's water, including instream uses. C-WIN accomplishes this mission through research, planning, public education, and litigation.
[3] AquAlliance is a 501(c)(3) organization that exists to defend northern California waters.
[4] We note that it is not clear from the notice exactly where the SED has been filed; according to CEQA Guidelines it should be filed with the California Natural Resources Agency.

September, October, and November 2012 workshops that were convened during Phase II activities on the comprehensive review of the Bay-Delta Plan. We call attention to the oral testimony by Bill Jennings, Chris Shutes, Tom Cannon, G. Fred Lee, and Tim Stroshane, representing CSPA, C-WIN, and, AquAlliance, that we presented in those workshops. We now welcome the Board's decision to include comments submitted on the previous SED as part of the administrative record, and we incorporate by reference the comments on the 2012 SED of CSPA, C-WIN, AquAlliance, Friends of the River and Restore the Delta that we submitted on March 29, 2013, to the degree that they do not conflict with the present comments and/or are not affirmatively answered and resolved in the 2016 version of the SED.[5] We now also incorporate by reference the comments of Bill Jennings and Chris Shutes at the December 16, 2016 hearing on the SED that the Board held in Stockton, California. Additionally, we incorporate by reference several previously submitted comments and correspondences from our organizations to the Board.[6]

The 2016 SED contains many fatal flaws, including, but not limited to, those enumerated immediately below.

First:: The bifurcation from the San Joaquin River of the upper San Joaquin River, and its (on average) 28% of the unimpaired inflow of the San Joaquin watershed, unreasonably transfers the total burden of providing fish flows, dilution of Westside wastes and contribution to Delta outflow to the lower San Joaquin tributaries. We could find no defensible discussion, rationale or technical or legal justification in the SED for this approach. It violates basic fairness and due process.

Second: We could find no defensible technical or legal justification for selecting a target of 40% and a range of 30 to 50% as adequate for the protection of public trust resources. The Board's 2010-flow report found that 60% February through June unimpaired flow is *minimally* necessary to protect public trust resources. The Department of Fish and Game's (now Department of Fish and Wildlife, DFW) 2010 Quantifiable Biological Objectives and Flow Criteria Report echoed this conclusion.[7] The SED contains no discussion of the methodology

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[5] The March 29, 2013 comments of CSPA, C-WIN, AquAlliance, Friends of the River and Restore the Delta are available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pdsed/docs/comments032913/michael_jackson.pdf

[6] Incorporated by reference for these comments are:

- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated February 8, 2011 providing comments on the November 2010 San Joaquin River flow and South Delta salinity objectives request for additional information by the State Water Board.
- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated May 23, 2011, providing comments on the scoping of the Southern Delta Ag and SJR Flow Revised NOP.
- Letter from the California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance to the Board, dated April 25, 2012, providing comments on the Bay-Delta Plan Supplemental NOP, Comprehensive Review.

[7] California Department of Fish and Game, *Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta*, November 23, 2010. Hereinafter, DFW 2010 Flow Report. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=25987

employed to select the recommended alternative. The proposed objectives and program of implementation in the SED's Appendix K contain no enforceable qualitative and quantitative performance measures to ensure progress.

Moreover, there is a lack of measurable performance measures, milestones and funding mechanisms to ensure success of the proposed "adaptive implementation" (aka adaptive management) program. Adaptive management appears to consist of the Stanislaus, Tuolumne and Merced (STM) Working Group gathering together in a back room to make deals, subject to approval of the Board's Executive Director, with no defined or required formal public process before the Board: otherwise known as business as usual. The quarter-century track record of adaptive management in the Delta – from CalFed to the Vernalis Adaptive Management Program, the Interagency Ecological Program, biological opinions and associated work groups, and myriad State Board proceedings – has been one of utter failure.

Third: Both staff and Board members stated during hearings that Phase I will include the balancing of the public trust. However, the SED offers no analysis of the methodology of the balancing that staff employed in developing its recommended project or that staff recommends that the Board apply in balancing. While the SED quantifies economic costs to agricultural and selected M&I water users, it does not quantify the economic benefits of healthy waterways, including ecosystem services, commercial and sport fisheries, recreation, public health, and the contingent value of a healthy river and estuary. The SED fails to identify, discuss or use the numerous state and federal guidelines and guidebooks on economic analyses that are routinely used by the Army Corps, USBR, USEPA and DWR in evaluating benefits and costs pertaining to public trust resources. We note that the public-trust balancing at Mono Lake found that the value of restoring the lake was between 56 and 132 times the value of the water lost by Los Angeles.

The SED's failure to quantify both sides of the benefit/cost ledger renders the SED and its economic analysis inadequate to support balancing.

Fourth: The SED proposes to increase the salinity limit in the south Delta by 43% during the irrigation season, based upon the six-year-old Hoffman Report[8] that:

1. Used 30-year old laboratory data on salt tolerance of bean varieties that are no longer relevant and ignored effects on different life stages;
2. Improperly employed data from subsurface drains in developing leaching fractions; and
3. Rejected more conservative modeling results.

The SED ignores Dr. Hoffman's explicit recommendations on needed additional studies. More recent research has established that Dr. Hoffman's leaching fractions are wrong. Consequently, the conclusions of the report are also wrong.

In addition, there is still no analysis in the SED of salinity impacts to riparian and aquatic vegetation, or to fish and plankton populations that have been identified as salt-sensitive.

[8] SED Appendix E.

Fifth: State and federal law has mandated a doubling of anadromous fisheries for more than two decades. The narrative standard in the Water Quality Control Plan has been ignored since it was established in 1995. Failure to include measurable performance measures with milestones ensures that the narrative standard remains unenforceable.

This comment letter identifies violations of the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (hereinafter "Porter-Cologne"), the Delta Reform Act of 2009, the California Environmental Quality Act and the Public Trust Doctrine. Further, we observe that the State Water Resources Control Board has put forward proposed amendments to San Joaquin River flow and South Delta salinity objectives for the 2006 Water Quality Control Plan for the Bay-Delta Estuary. Under the Clean Water Act, the Board has failed to comply with requirements to protect the most sensitive beneficial uses and to comply with its own federal Clean Water Act anti-degradation policy for water quality. The Board has failed to formulate these amendments to the 2006 Bay-Delta Plan in a manner that analyzes the competing demands of all beneficial uses.

The Water Board has a federal mandate under the CWA to protect waterway beneficial uses, particularly "protection and propagation of fish, shellfish, and wildlife" (CWA § 101(a)(2)). This mandate may properly impact individual water rights as needed to address "legitimate and necessary water quality considerations." Accordingly, the update of the Water Quality Control Plan must specifically consider CWA compliance in developing and assessing alternative flow scenarios.

State flow and salinity objectives must *fully* protect – not "reasonably protect" – beneficial uses. The CWA does not allow protection of these uses to be balanced away. Application of Porter-Cologne Section 13241 factors, or a misuse of balancing between public trust assets and economic interests, cannot result in beneficial use protections that are less than those that the CWA mandates. The 2016 draft SED does only slightly better than the previous flawed SED in protecting beneficial uses and public trust assets in the Bay-Delta. As a result of the Water Board's mistaken application of both the law and the facts, the 2016 SED proposes a flow requirement of 30-50% of February-June unimpaired flow that will not protect beneficial uses.

The SED compounds the problem of inadequate flow and temperature requirements by adding a totally flawed adaptive management program that stands in direct opposition to the whole concept of enforceable standards. Adaptive management moves the protections of beneficial uses to a future in which water users and government agencies will decide in a back room, on a yearly basis, what flow, temperature, and other conditions to apply. The CWA specifically subordinates impacts on water rights to the duty of the Water Board to provide sufficient water to address water quality requirements. The CWA requires the state to develop criteria to protect beneficial uses impacted by flow. The SED's proposed objectives would unlawfully reverse these CWA requirements.

I. BACKGROUND

The SED is a substitute environmental document prepared by the State Board during a phased evaluation of the 2006 Bay-Delta Plan, with Phase I focusing on the Lower San Joaquin River flow and south Delta salinity objectives, and Phase II focusing on all other parts of the Bay-Delta Plan. The purpose of the SED is for the board to document its analysis regarding the need for, and effects of, changes to the Bay-Delta plan. The SED proposes new plan amendments to the Lower San Joaquin River flow objectives, including along three salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers), during the months of February-June. The SED includes scientific information that indicates that higher flows of a more natural pattern are needed from the three eastside salmon-bearing tributaries to the Lower San Joaquin River during the spring (February–June) to protect fish and wildlife beneficial uses (including San Joaquin River Basin fall-run Chinook salmon and other important ecosystem processes).[9]

The preparation of the SED is governed by many different laws, including state CEQA guidelines, the Public Resources Code section 21159, the Porter-Cologne Act (in particular Water Code section 13241), and the federal Clean Water Act (as it applies to water quality standards promulgated by the Board). Further, portions of water quality control plans that fall under the jurisdiction of the CWA require approval by the U.S. Environmental Protection Agency. These various laws charge the Board with, among other things, reasonably describing and analyzing potentially significant direct and indirect environmental impacts of a project; describing and analyzing reasonably foreseeable methods of compliance with the regulatory requirements of each alternative; analyzing potentially feasible mitigation measures and the economic considerations of establishing objectives in water quality control plans; and analyzing related indirect and induced impacts on the regional economy including estimating the total cost of implementing the water quality control program.

In addition to the various laws mentioned above, governments have a permanent fiduciary responsibility and obligation to protect the public trust.[10] In *National Audubon Society v. Superior Court*, the California Supreme Court held that "the public trust is more than an affirmation of state power to use public property for public purposes. It is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases when abandonment of that right is consistent with the purposes of the trust."[11] The act of appropriating water is an acquisition of a property right from the waters of the state, an act that is therefore subject to regulation under the state's public trust responsibilities.

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[9] SED Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, p. 3-1.

[10] Justice Racanelli wrote in 1986: "In the new light of National Audubon, the Board unquestionably possessed legal authority under the public trust doctrine to exercise supervision over appropriators in order to protect fish and wildlife. That important role was not conditioned on a recital of authority. It exists as a matter of law."

[11] California Supreme Court, *National Audubon Society, et al., v. The Superior Court of Alpine County and Department of Water and Power of the City of Los Angeles, et al.* S.F. 24368. Filed February 17, 1983. Cited as 33 Cal.3d 419, (189 Cal.Rptr. 346, cert. denied, 464 U.S. 977), p. 441. Accessible online at http://www.monobasinresearch.org/images/legal/nassupct.htm.

The Sacramento-San Joaquin Bay Delta is both a tideland and a marshland. Therefore the Board has authority to protect the Bay Delta pursuant to the public trust. As an agency of the state, the Board is charged with ensuring that the state of California carries out its fiduciary responsibility to protect air, running water, the sea, and the seashore, "these things that are common to all." The board has invoked its public trust responsibilities in regulating the waters of California and acknowledges that the public trust is one of its ongoing regulatory responsibilities.[12] The Board has also adopted regulations governing how it treats the public trust in matters of the appropriation of water in California.[13] The Public Trust Doctrine provides that no one has a vested right to appropriate water in a manner harmful to the interests protected by the public trust.[14] In accordance with this doctrine, California's constitution promises water rights only up to what is a reasonable use. No one has a right in California to use water unreasonably, not even the federal government.[15]

In *United States v. State Water Resources Control Board* (1986, 182 Cal.App.3d 82), the court determined that the Board had the authority to modify an appropriative water right permit once it had been issued, and that it could reduce the US Bureau of Reclamation's Central Valley Project permits to gain compliance from the Bureau. In *Light v. State Water Resources Control Board* (2014) (226 Cal.App.4th 1463,1481-1482), the court found:

> Foremost among plaintiffs' grounds for challenging the regulation is their contention the Board lacks the regulatory authority to limit water use by riparian users and early appropriators, whose diversion is beyond the permitting authority of the Board. Although the Board has no authority to require such users to obtain a permit to divert, there is no question it has the power to prevent riparian users and early appropriators from using water in an unreasonable manner. We conclude that, in regulating the unreasonable use of water, the Board can weigh the use of water for certain public purposes, notably the protection of wildlife habitat, against the commercial use of water by riparian users and early appropriators. Further, the Board may exercise its regulatory powers through the enactment of regulations, as well as through the pursuit of judicial and quasi-judicial proceedings.

II. THE SED DOES NOT MEET THE REQUIREMENTS OF CEQA.

Although the SED is, by definition, a supplemental environmental document, the Board must comply with the requirements of the California Environmental Quality Act when adopting water quality control plans. Under CEQA, a "project" to be analyzed is defined as "whole of an

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[12] State Water Resources Control Board, Mono Lake Basin Water Right Decision 1631: Decision and Order Amending Water Right Licenses to Establish Fishery Protection Flows in Streams Tributary to Mono Lake and to Protect Public Trust Resources at Mono Lake and in the Mono Lake Basin, September 28, 1994, 212 pages. Accessible online at: http://www.swrcb.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1631.pdf.

[13] State Water Resources Control Board, California Code of Regulations, Title 23 Waters, Division 3 State Water Resources Control Board and Regional Water Quality Control Boards (Sections pertaining to water rights), January 2011, 168 pages. See Article 14, Standard Permit Terms and Conditions. Accessible online at http://www.swrcb.ca.gov/laws_regulations/docs/wrregs.pdf.

[14] National Audubon Society, op. cit.

[15] California Constitution, Article X, Section 2.

action" that would cause direct or reasonably foreseeable indirect physical environmental changes.[16] CEQA defines a "project" as plans or programs in which multiple actions are coordinated or facilitated within a framework of policies that govern the sequence or series of those actions. In performing CEQA analysis of a plan or program, then, agencies are prohibited from "piecemealing" or "segmenting" a project by splitting it into two or more segments.[17] CEQA prohibits piecemealing because to segment a project can submerge the cumulative impact of individual environmental impacts. In *Laurel Heights Improvement Association v. Regents of the University of California,* (1988) 47 Cal. 3d 376, 396 the court declared that environmental reviews must "include an analysis of the environmental effects of future expansion or other action if: (1) it is a reasonably foreseeable consequence of the initial project; and (2) future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects."

A. The SED Fails to Consider the Whole of the Action in the Sacramento-San Joaquin Bay-Delta

In preparation of the SED, the Board has segmented review of the San Joaquin River flow and south Delta salinity objectives from the rest of its activities updating the 2006 Bay-Delta Water Quality Control Plan. Specifically, the Board refers in descriptions of its planning process to Phase I being the revision of the flow and salinity objectives, while Phase II is the "comprehensive review" of the 2006 Bay-Delta Plan. The Board has also issued two separate notices of preparation (NOPs) for each segment of its planning process.[18]

In February of 2009, the Board issued a "Notice of Preparation" (hereinafter "NOP") entitled "Update and Implementation of the Water Quality Control Plan for the San Francisco Bay / Sacramento-San Joaquin Delta Estuary." The NOP proposed a project that would analyze "the Bay-Delta watershed and its upstream tributaries and any reservoirs for which water may be used to meet the water quality objectives, including upstream reservoirs and San Luis

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[16] CEQA Guidelines, §15378.

[17] "This approach ensures 'that environmental considerations not become submerged by chopping a large project into many little ones, each with a potential impact on the environment, which cumulatively may have disastrous consequences." Burbank-Glendale-Pasadena Airport Authority v. Hensler (2d Dist. 1991) 233 Cal. App. 3d 577, 592 [284 Cal Rptr. 498], cited in Michael Remy, Tina A. Thomas, James G. Moore, and Whitman F. Manley, Guide To CEQA, 11th ed., Point Arena, CA: Solano Press Books, 2007, p. 89.

[18] State Water Resources Control Board, *Notice of Preparation and of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Southern Delta Salinity and San Joaquin River Flows*, February 13, 2009, stated on p. 2:

> The State Water Resources Control Board…will be the lead agency and will prepare environmental documentation for the potential update and changes to implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary… The proposed Project includes both: 1) the review and update of water quality objectives, including flow objectives, and the program of implementation in the Bay-Delta Plan; and 2) changes to water rights and water quality regulation consistent with the program of implementation. Accordingly, the environmental documentation will identify and evaluate the significant environmental impacts associated with potential changes to the Bay-Delta Plan and potential changes to water rights and other measures implementing the plan that may be needed to ensure the reasonable protection of beneficial uses in the Bay-Delta watershed.

Reservoir." The area of potential environmental effects encompassed most of the state, including the Bay-Delta watershed, the Trinity River watershed from which water is imported to the Bay-Delta watershed, and areas receiving water exported from the Bay-Delta watershed.[19]

In November of 2009, the State Legislature passed Water Code § 85086 as part of the Delta Reform Act of 2009, which required the Board to develop new flow criteria to protect the public trust.[20] Following extensive testimony, the Board drafted the 2010 Delta Flow Criteria Report, which acknowledged that determining flow criteria for the protection of public trust resources is necessary to "inform planning decisions for the Bay Delta Plan."[21] The report identifies several flow criteria for the Sacramento and San Joaquin Rivers, as well as for Delta outflow. The report represents a comprehensive review of water quality objectives, a clear list of "species of importance" and their relevant life stages, an analysis of both beneficial uses and water quality objectives, and an analysis of the times in which water is most important to the health of individual species of fish.[22]

Eight months after publishing the 2010 Delta Flow Criteria Report, the Board issued, on April 1, 2011, a "*Revised Notice of Preparation and Notice of Additional Scoping Meeting*," with the subtitle: "*Update to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Water Quality Objectives for the Protection of Southern Delta Agricultural Beneficial Uses; San Joaquin River Flow Objectives for the Protection of Fish and Wildlife Beneficial Uses; and the Program of Implementation for Those Objectives.*"[23] However, in this second notice, the Board dramatically limited the scope of review of the project to only two project areas: the south Delta, which encompasses both the service area of the South Delta Water Agency and the State and Federal export pumps, and the major tributaries of the lower San Joaquin River (the Merced, Tuolumne, and Stanislaus rivers), together with the lower

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[19] Id., p. 3.

[20] The Delta Reform Act, November, 2009, states:

> For the purpose of informing planning decisions for the Delta Plan and the Bay Delta Conservation Plan [BDCP], the board shall, pursuant to its public trust obligations, develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. In carrying out this section, the board shall review existing water quality objectives and use the best available scientific information. The flow criteria for the Delta ecosystem shall include the volume, quality, and timing of water necessary for the Delta ecosystem under different conditions. The flow criteria shall be developed in a public process by the board within nine months of the enactment of this division. The public process shall be in the form of an informational proceeding...and shall provide an opportunity for all interested persons to participate. The flow criteria shall not be considered predecisional with regard to any subsequent board consideration of a permit, including any permit in connection with a final BDCP.

[21] State Water Resources Control Board, *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, Prepared pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009.* Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf. Approved in Resolution No. 2010-0039 (hereinafter cited as "2010 Delta Flow Criteria Report.")

[22] 2010 Delta Flow Criteria Report, Table 2, pp. 45-46.

[23] State Water Resources Control Board, *Revised Notice of Preparation and Notice of Additional Scoping Meeting*, April 1, 2011. The Revised NOP is available at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/notice_sjr_flow_southern_delta_scoping_mtg_with_attachments.pdf

San Joaquin River itself.[24] This notice limits the purpose of the review to evaluation of southern Delta salinity and San Joaquin River flow objectives and their implementation through the Bay-Delta Plan under CEQA.[25]

In January 2012, the Board issued a third NOP for the Bay-Delta Plan's Comprehensive Review, addressing all other elements of the Bay-Delta Plan and or potential changes to protect beneficial uses in the Bay-Delta *other than* San Joaquin river flows or South Delta salinity objectives.[26] In essence, what started in 2009 as a Board analysis of a "whole action" affecting the San Francisco/Sacramento-San Joaquin Bay Delta Estuary had become bifurcated by 2011.

The segregation of the Sacramento River from the San Joaquin River is a complete departure from how the Board has historically analyzed Sacramento River and San Joaquin River water quality objectives. Dating back to at least 1978, the Board has always reviewed the Sacramento River and San Joaquin River water quality objectives in a unified way, as essential elements in the "whole of an action" undertaken as development of the Bay-Delta water quality control plan.[27] As recently as 2010, the Board considered the two river basins simultaneously.[28]

Further, consideration of Delta hydrodynamics is illogical without considering the Sacramento and San Joaquin rivers simultaneously. First, the hydrodynamics of the Delta are not readily segmented because the Sacramento and San Joaquin River inflows meet in the central and south Delta river channels and are intermingled with tidal flows coming east from the Carquinez Strait and Suisun Bay. Second, when considering water quality, inflows from the San Joaquin River must be analyzed because of their potential effect on waters reaching the central Delta and Old River channels, from which state and federal project pumps near Tracy draw water for exports. Third, the Sacramento River and San Joaquin River inflows jointly govern the timing and magnitude of salmon recruitment from the ocean and salmon smolt outmigration, as well as the degree to which conditions in the Bay-Delta estuary provide habitat for salmon, steelhead, and resident and migratory species like longfin smelt, Delta smelt, and striped bass.

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[24] Id.

[25] Id., p. 3, "[the Board] is not currently considering any other changes to the Bay-Delta Plan or any specific changes to water rights and other requirements implementing the Bay-Delta Plan."

[26] State Water Resources Control Board, *Supplemental Notice of Preparation and Notice of Scoping Meeting for Environmental Documentation for the Update and Implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: Comprehensive Review*, January 24, 2012. Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/pubnot042512.pdf Page 2 of this document states: "The State Water Board is not soliciting information regarding these [the San Joaquin River flow and South Delta salinity objective] potential amendments and related SED at this time."

[27] See State Water Resources Control Board, *Water Quality Control Plan, Sacramento-San Joaquin Delta and Suisun Marsh*, August 1978,Table VI-1, p. VI-29; *Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 91-15WR*, May 1991, Table 1-1; *Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 95-1WR*, May 1995, Table 1; and *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, December 13, 2006, Tables 1 through 3. In each of these tables, it is evident that the Board considers and treats through regulation the flow and salinity objectives from both the Sacramento and San Joaquin Rivers simultaneously and together and not in a segmented fashion.

[28] In the 2010 Delta Flow Criteria Report.

The first iteration of the SED (2012) accepted this bifurcation. The 2016 version of the SED continues it.

B. The SED Fails to Establish an Accurate and Complete Baseline for the Project.

The appropriate baseline for this second SED issued by the Water Board to update the 2006 Water Quality Control plan should include the following: Water Rights Decision 1641 ("D-1641"), the 2009 Biological Opinions of the USFWS and NMPS, and the analysis of the necessary flows required by the Delta Reform Act contained in the 2010 Delta Flow Criteria Report and in the corresponding California Department of Fish & Wildlife report on the needs of the state listed species in the Bay-Delta. It should also include recent reports of state and federal fish agencies that document adverse effects to fisheries that occurred during the recent five-year drought, including the effects of the suspension of the protections of D-1641 and other protective orders under the Governor's drought emergency proclamations, and the effects of the Water Board's relaxation of flow requirements in various TUCP orders issued in response to requests by operators of the State Water Project and the Central Valley Project. The SED describes only some of these elements as part of the baseline.

The description of the baseline on page ES-51 of the SED does not adequately describe the overappropriation of surface water in the San Joaquin basin as a baseline condition. This condition is the major reason that previous water quality standards have so woefully failed in the watershed. While Chapter 9 of the SED generally describes the overdraft of groundwater and identifies it as part of the baseline condition, the 2016 SED continues the State Board's decades-long refusal to disclose and analyze the overappropriation of San Joaquin River water for agricultural use at the expense of the environment. None of the alternatives considered in the SED address this overappropriation for what it is: the foremost problem in the watershed.

The baseline for the SED also includes a vestige of the previous water quality control plan, the Vernalis Adaptive Management Program (VAMP) experiment, which failed and which has been over for years. For purposes of analysis, VAMP should be removed from the baseline.

C. The SED Does Not Define its Proposed Project.

Appendix K ("Revised Water Quality Control Plan") of the SED defines the proposed Project under CEQA.

Appendix K proposes changes to water quality objectives at Table 2 (Water Quality Objectives for Agricultural Beneficial Uses), pp. 15-16, and Table 3 (Water Quality Objectives for Fish and Wildlife Beneficial Uses), pp. 17-21.

Substantively, the Appendix K proposes changes to objectives for agricultural beneficial uses that would change the compliance locations from three existing south Delta water quality stations (San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge) to three reaches of river (San Joaquin river between Vernalis and Brandt Bridge, Old River from Middle River to Victoria Canal, and Old River/Grant Line Canal from

Head to West Canal). Appendix K also proposes changes to the April through August numeric salinity requirement at these locations and at San Joaquin River at Airport Bridge Way, Vernalis from .7 mmhos to 1.0 dS/m/m.[29]

Substantively, Appendix K proposes changes to objectives for fish and wildlife beneficial uses that would change the objectives for Lower San Joaquin River flows. These changes would eliminate the D-1641 San Joaquin River flow requirements and substitute a narrative objective, a San Joaquin River flow objective requiring "[a] percent of unimpaired flow between 30% - 50%, inclusive, from each of the Stanislaus, Tuolumne, and Merced Rivers shall be maintained from February through June," and a minimum February through June San Joaquin River at Vernalis flow requirement of between 800 and 1200 cfs if the required percent of unimpaired flow should drop below those values.[30]

All three San Joaquin tributaries are listed under Clean Water Act Section 303(d) as impaired for water temperature. However, proposed objectives for water temperature are absent from Appendix K, which should have explicitly set water temperature objectives in the process of setting standards. Attachment 1 to these comments suggests a scientific basis by which the Board could set such standards.

Appendix K proposes extensive additions to the Program of Implementation, pp. 26-64. Insofar as it addresses the implementation of Lower San Joaquin River flow objectives, the description of the Program of Implementation states various authorities that the Board may employ. Among the authorities are water rights and water quality authorities (including Section 401 of the Clean Water Act).

The description of the Program of Implementation also states a suite of elements that the Board may consider, including Delta outflow, Sacramento River at Rio Vista flow, Lower San Joaquin River flow, export limits, Delta Cross Channel Gates operation, and salinity.[31] However, the Board defers Delta outflow, Sacramento River flow, export limits and Cross Channel Gates operation to Phase II of the update of the Water Quality Control Plan, noting for the moment its water rights authority. Appendix K extensively discusses implementation of the Lower San Joaquin River flow objectives and southern Delta salinity objectives.[32]

Appendix K describes a suite of elements that the Board it may include in the program of implementation for the Lower San Joaquin River flow objectives. First:

> When implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, on other beneficial uses.[33]

[29] SED, Appendix K, p. 15.
[30] Id., p. 18
[31] Id., p. 28.
[32] We discuss proposed changes to southern Delta salinity objectives separately, below.
[33] Id., p. 28.

In addition:

> The LSJR flow objectives for February through June shall be implemented by requiring 40 percent of unimpaired flow, based on a minimum 7-day running average, from each of the Stanislaus, Tuolumne, and Merced Rivers. This required percentage of unimpaired flow, however, may be adjusted within the range allowed by the LSJR flow objectives through adaptive methods detailed below.[34]

Appendix K's description of the Program of Implementation also describes four elements of "Adaptive Implementation," and how those elements may be combined:

> a) The required percent of unimpaired flow may be adjusted to any value between 30 percent and 50 percent, inclusive. …
> b) The required percent of unimpaired flow for February through June may be managed as a total volume of water and released on an adaptive schedule … .
> c) The release of a portion of the February through June unimpaired flow may be delayed until after June to prevent adverse effects to fisheries, including temperature … .
> d) The required base flow for February through June may be adjusted to any value between 800 and 1,200 cfs, inclusive. …
>
> Any of the adjustments in (a)-(d) above may be made independently of each other or combined. The adjustments in (a), (b), and (c) may also be made independently on each of the Stanislaus, Tuolumne, and Merced Rivers, so long as the flows are coordinated to achieve beneficial results in the LSJR related to the protection of fish and wildlife beneficial uses.[35]

The description of the Program of Implementation proposes to create a "Stanislaus, Tuolumne and Merced [STM] Working Group" to execute "adaptive implementation":

> The State Water Board will establish a STM Working Group to assist with the implementation, monitoring and effectiveness assessment of the February through June LSJR flow requirements. Specifically, the State Water Board will seek recommendations from the STM Working Group on biological goals; procedures for implementing the adaptive methods described above; annual adaptive operations plans; and the SJRMEP, including special studies and reporting requirements. Each of these activities is described in more detail below.
>
> The State Water Board will seek participation in the STM Working Group by the following entities who have expertise in LSJR, Stanislaus, Tuolumne, and Merced Rivers fisheries management, hydrology, operations, and monitoring and assessment needs: the DFW; NMFS; USFWS; and water users on the Stanislaus, Tuolumne, and Merced Rivers. The STM Working Group will also include State Water Board staff and may include any other persons or entities the Executive Director determines to have

[34] Id., p. 29.
[35] Id., p. 30

appropriate expertise. Subgroups of the STM Working Group may be formed as appropriate and State Water Board staff may also initiate activities in coordination with members of the STM Working Group.[36]

In modeling various alternatives, the Board staff made certain assumptions that it describes in Modeling Appendix F, pp. F.1-31 to F.1-33. The Modeling Appendix states:

> The analysis contained in this SED provides LSJR alternatives that represent examples of system operation to determine the significance of impacts, pursuant to CEQA. Selection of appropriate parameters has first been made to represent baseline conditions most closely in terms of diversion allocations and reservoir operations, similar to those in the CALSIM baseline scenario. Under additional streamflow requirements of the LSJR alternatives, changes in water availability require adjustment of parameters to ensure feasibility for the 82-year simulation so that the reservoirs are not drained entirely in the worst droughts of record. In addition, carryover storage guidelines have been increased for New Melones Reservoir and New Exchequer Reservoir to minimize impacts on instream temperature that would be caused by lower reservoir levels and a limited coldwater pool. *These operational constraints, as components of modeling simulations, do not by themselves comprise a plan of implementation or otherwise carry the weight of regulatory requirements. Rather, they are included as elements of the modeling simulation to evaluate the feasibility of the LSJR alternatives. An implementation plan developed in a future proceeding would need to identify and evaluate supply, storage, and temperature conditions and appropriate operational objectives, to best protect beneficial uses and avoid adverse effects where feasible.*[37]

It is not enough under CEQA to demonstrate the *feasibility* of project alternatives. Rather, one must analyze the *impacts* of various project alternatives. Appendix K does not discuss diversion allocations at all, and discusses carryover storage and temperature targets as something the Board will develop in the future. It discusses biological objectives only as something that the "STM Working Group" will develop in the future, substituting process for substance.

Yet all of these factors are crucial in disclosing impacts. Carryover storage requirements may mitigate water temperature conditions that could otherwise be worsened by increasing flows while maintaining existing levels of diversion allocations. Carryover storage requirements would thus either require reduction of diversion allocations or reduction of instream flow. Water temperature targets could affect the levels of carryover storage needed to achieve them; this could in turn further affect diversion allocations.

In short, it is not enough to choose one example of diversion allocations, carryover storage and water temperature requirements, and analyze flow alternatives using this example. Different values for these three elements will cause different impacts of project alternatives. While "an implementation plan [must be] developed in a future proceeding," and may be subject to a project CEQA analysis, the program CEQA analysis must evaluate a menu of different

[36] Id., p. 32.
[37] SED Appendix F, p. F.1-31. Emphasis added.

values and explain the relative impacts. Absent such analysis, the program CEQA analysis is so vague that it is useless in aiding reasoned decision making.

In fact, the modeling effort to "ensure feasibility" looks rather at an after-the-fact modeling effort that uses perfect foresight to reduce impacts as much as possible: the opposite of disclosing impacts of various potential choices for system operation. As a practical matter, one could not operate the system as the SED models it. In the "example" modeling for SED Alternatives 3 and 4, the modelers achieve reduction of impacts by "flow shifting:" moving water from spring flow to later in the year to mitigate water temperature impacts (which themselves are not specified by threshold or target values).[38] But the "STM Working Group" cannot know in January, when it is supposed to propose an operating plan for the water year,[39] what hydrology over the next five months will be. It will not know what inflows will be, what storage will be, what flows will be, or what diversion allocations will be. It will not know what summer meteorology will be. It will not know what percent of water to allocate for later in the year or how much water that percent will amount to in acre-feet.

Thus, while the modeling for the present, recirculated SED makes numerous refinements and improvements over the modeling performed for the 2012 version of the SED,[40] the use of modeling in the recirculated SED retains a basic flaw. Rather than defining a project, options for implementing the project, project impacts, and potential mitigations for these impacts in accordance with CEQA, the SED performs modeling whose apparent purpose is to achieve the desired result of an impacts analysis. Rather than use the SED to support the project and modeling to support the SED, the SED purports to make a key finding using modeling while requiring future actions to define the actual project, part of whose goal is to achieve this key finding.

Further, to actually implement flow objectives, carryover storage targets and diversion allocations, operators on each tributary would have to iteratively evaluate, from about January through June, storage, inflow, runoff and (potentially) water-year types to define and meet each of these elements. That implementation contains an inherent level of uncertainty and risk management, which in themselves create a sometimes substantial margin of error and potential impacts. The actual art of reservoir operation is lost in a modeling exercise that assumes perfect foresight.

To determine potential mitigation for thermal impacts of increased spring flow, the SED should have defined and evaluated various requirements for flow, carryover storage, and diversion allocations on each tributary against various target thermal conditions at various locations. Based on this analysis, the SED should have proposed a mitigation package including summer flow requirements to mitigate thermal impacts of the combined impacts of flow, carryover storage and diversion allocations. In addition, the SED should have de-coupled the February-June flow requirement from the summer flow requirement. One cannot evaluate

[38] Although SED Appendix K allows "adaptive implementation" of Alternative 2, modeling in support of the SED includes no "flow shifting" for Alternative 2. Thus this aspect of the modeling for Alternatives 2 and for Alternatives 3 and 4 are fundamentally different.
[39] SED Appendix K, p. 34.
[40] See SED Appendix F.1, Table F.1.2-3 and pp. F.1-12 to F.1-13 for detailed description of modeling changes.

whether the February-June flow objectives will achieve desired biological goals in their own right if in any or all years the STM Working Group can, in the name of "adaptive implementation," reduce those flow objectives to achieve summer thermal targets. This rob-Peter-to-pay-Paul paradigm likely also understates impacts to water supply: to actually mitigate summer thermal conditions without having the benefit of perfect foresight, operators will need to devote additional water to summer flows, making less water available for carryover storage, diversion allocations, or both.

The SED should similarly have analyzed a suite of alternatives for Delta export operations[41] in order to evaluate both the benefits to fish[42] and the salinity impacts of increased February-June Lower San Joaquin Flow objectives. While the Board may condition export operations (potentially including OMR requirements) in a future proceeding,[43] without evaluating their effect one cannot evaluate the fisheries benefits and the salinity impacts of the Lower San Joaquin Flow objectives that the Board is proposing now. It accomplishes little to improve conditions for aquatic life in the San Joaquin River if out-migrating salmon cannot reach Chipps Island and the sea. Particle tracking, EC tracking and fish tagging studies all demonstrate that San Joaquin River water and salmon smolts are drawn to the state and federal project pumps. As written, Appendix K leaves intact the allowance that the SWP and CVP may collectively export the entire inflow of the San Joaquin River from April 15 through May 15, or another 30-day period determined by a committee, and allows even greater export of San Joaquin flow at other times.[44] This also has water supply and in some cases salinity impacts to tributary and lower San Joaquin water users, to Delta water users and other in-Delta diverters (such as Contra Costa Water District), to export water users, and indirectly to Sacramento River and Sacramento River tributary water users.

The SED should also have analyzed a suite of operational constraints and scenarios for impacts to the water supply of the City and County of San Francisco and its wholesale customers (collectively, CCSF).[45] Instead, the SED[46] assumes that CCSF will have to provide about 52%

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[41] The SED analyzes the effect of Lower San Joaquin River Flow objectives on the availability of water for export (Appendix F.1, Section F.1.7). It does not analyze how various export scenarios combine with flow objectives to affect salinity or how different export scenarios affect the performance of flow objectives in improving conditions for fish and wildlife.

[42] "The State Water Board will exercise its water right and water quality authority to help ensure that the flows required to meet the LSJR flow objectives are used for their intended purpose and are not diverted for other purposes." Id., p. 28. "Although the lowest downstream compliance location for the LSJR flow objectives is at Vernalis, the objectives are intended to protect migratory LSJR fish in a larger area, including within the Delta, where fish that migrate to or from the LSJR watershed depend on adequate flows from the LSJR and its salmon-bearing tributaries." Id., pp. 28-29. There is simply no way to evaluate the potential effectiveness of the flow objectives in terms of what is "intended" without analyzing what happens in the Delta. The Lower San Joaquin River flow objectives are intended to protect fish and wildlife beneficial uses. One cannot prevent Lower San Joaquin River flows from being "diverted for other purposes" without explicitly limiting exports.

[43] Id., p. 39.

[44] Id., top of p.19. The Biological Opinions for the long-term operation of the State Water Project and the Central Valley Project contain additional export restrictions. However, NMFS and USFWS have reinitiated consultation for these operations. The Board should not rely on export restrictions in Biological Opinions to protect beneficial uses, particularly in an era where stated federal policy is to favor exports over aquatic protections.

[45] CSPA and others suggested many options in a letter to the Board dated October 8, 2014. We incorporate that letter by reference. It is already in the record for this proceeding and is available at:

of any required flow increase in the Tuolumne River pursuant to the Fourth Agreement between CCSF and Turlock and Modesto irrigation districts (TID and MID). It evaluates two scenarios for drawing on the Water Bank to which CCSF has contractual rights in Don Pedro Reservoir, and it otherwise assumes that CCSF will purchase water from TID and or MID, despite the apparent lack of willingness of these entities to sell. These limited scenarios are supposed to be representative examples of how CCSF might respond to increased flow requirements in the Tuolumne River, but they capture only a narrow range of potential impacts and do little to inform decision making about how the Board or CCSF might reduce or mitigate water supply impacts to CCSF.

Appendix K announces that during a "State of Emergency," the Board on its own motion or any affected party can petition the State Board for a temporary change in the implementation of the Lower San Joaquin Flow objectives:

> At its discretion, or at the request of any affected responsible agency or person, the State Water Board may authorize a temporary change in the implementation of the LSJR flow objectives in a water right proceeding if the State Water Board determines that either (i) there is an emergency as defined in the California Environmental Quality Act (Pub. Resources Code, § 21060.3) or (ii) the Governor of the State of California or a local governing body has declared a state or local emergency pursuant to the California Emergency Services Act (Gov. Code, § 8550 et seq.) and LSJR flow requirements affect or are affected by the conditions of such emergency. Before authorizing any temporary change, the State Water Board must find that measures will be taken to reasonably protect the fish and wildlife beneficial use in light of the circumstances of the emergency.

There is no definition in Schedule K of what might constitute a state of emergency. It leaves it to politicians, without any objective reference, to determine the conditions under which implementation of water quality objectives may be open to suspension. Recent history in 2007-2009 and 2013-2016 suggests that a sequence of two consecutive dry years followed by a dry autumn is likely to trigger such an "emergency." The categorical exception places no sideboards or objective criteria by which the State Board may "find that measures will be taken to reasonably protect the fish and wildlife beneficial use." The "State of Emergency" exception does not define the type of proceeding that the Board will employ to "authorize a temporary change," including whether it will hold a hearing or whether that hearing will be evidentiary in nature. Based on 2014-2016, it is reasonable to assume that the Board will hold no evidentiary hearing in such instances. Considering that 41 of the past 100 years have been part of drought sequences, Appendix K thus fails to provide any definition whatever for the proposed project in roughly 25% of all years.

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/review/docs/100814_resp2ccsf_sedimpacts.pdf

[46] See SED, Appendix L.

D. The SED Does Not Analyze a Reasonable Range of Alternatives.

1. The Alternatives for Lower San Joaquin Flow Objectives Presented in the SED Are Incomplete.

The alternatives for Lower San Joaquin Flow objectives proposed in Schedule K are incomplete. The alternatives are stated as a range of flows: No Project; Alternative 2 (20-30% of February-June unimpaired flow); Alternative 3 (30-50% of February-June unimpaired flow); and Alternative 4 (50-60% of February-June unimpaired flow). However, these alternatives do not specify diversion allocations, carryover storage and water temperature requirements. They allow unspecified off-ramps in about 25% of all years. They do not evaluate beneficial effects or impacts under different scenarios that vary export constraints. They do not specify the biological goals against which their effectiveness will be measured. They do not specify water temperature objectives. They do not consider a reasonable range of options for limiting or mitigating the impacts to CCSF. For these reasons, they are not complete alternatives and cannot serve to evaluate impacts or benefits in a reasoned fashion.

2. The Alternatives for Lower San Joaquin Flow Objectives Presented in the SED Are Unclear.

The alternatives for Lower San Joaquin Flow objectives proposed in Schedule K are unclear. They are listed as a range of flows that the STM Working Group will recommend and which operators will implement following approval by the State Water Board or its Executive Director. The alternatives are stated as a range of flows: No Project; Alternative 2 (20-30% of February-June unimpaired flow); Alternative 3 (30-50% of February-June unimpaired flow); and Alternative 4 (50-60% of February-June unimpaired flow). Alternatives 2, 3 and 4 would also have a February-June floor flow value at Vernalis of 1000 cfs (subject to adjustment as described below). In addition, alternatives 2, 3 and 4 are subject to "adaptive implementation" as described above. Adaptive implementation includes the opportunity for the STM Working Group to adjust the objectives in the following ways: adjust the percentage of unimpaired or down; implement the percent of unimpaired as a 7-day running average or to aggregate the total quantity of water into blocks; use some of the total volume of water in months outside of the February-June period ("flow shifting"); and adjust the 1000 cfs floor Vernalis flow value up or down within a range of 800 cfs to 1200 cfs.[47]

Appendix K offers no guidance on how the STM Working Group, composed of water user, fishery agency, and State Board staff, and perhaps others at the discretion of the Board's Executive Director, will make its decisions. Appendix K provides no objective basis on which to base these decisions. The "adaptive implementation" group is supposed to make its own rules and set its own biological goals, the latter of which the Board will approve in the future. While Appendix K recommends starting at 40%, there is nothing to prevent the STM Working Group from seeking to change that percentage on day 2. Conservation and public interest groups

[47] Id., p. 30. While a change in the February-June percent of unimpaired and in the floor flow value for Vernalis require unanimous agreement of the STM Working Group and the approval of the Board's Executive Director, a change to a block flow approach or for flow shifting to other months requires only the recommendation of one Working Group member and the approval of the Executive Director. Id., pp. 30-31.

assume that the STM Working Group will quickly seek modify the figure to the minimum; water users appear to assume that the STM Working Group will equally quickly seek to modify the figure to the maximum. Each type of entity will perform analysis for these comments that reflect these assumptions.

State Board staff's 2010 *Development of Flow Criteria for the Sacramento –San Joaquin Delta Ecosystem* (hereinafter, 2010 Delta Flow Criteria Report) emphasized the importance of variability in flow patterns as a cornerstone of the benefits of flow and good flow management:

> Flow related factors that affect public trust resources include more than just volumes of inflow and outflow and no single rate of flow can protect all public trust resources at all times. The frequency, timing, duration, and rate of change of flows, the tides, and the occurrence of overbank flows, all are important. *Seasonal, interannual, and spatial variability in flows, to which native species are adapted, are as important as the quantity of flow. Biological responses to flows rest on combinations of quantity, timing, duration, frequency and how these inputs vary spatially in the context of a Delta that is geometrically complex, highly altered by humans, and fundamentally tidally driven*.[48]

The *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives* (February, 2012; "SJ Technical Report") similarly noted:

> The State Water Board has determined that higher and more variable inflows during the February through June time frame are needed to support existing salmon and steelhead populations in the major SJR tributaries to the southern Delta at Vernalis. This will provide greater connectivity to the Delta and will more closely mimic the flow regime to which native migratory fish are adapted. Water needed to support sustainable salmonid populations at Vernalis should be provided on a generally proportional basis from the major SJR tributaries (Stanislaus, Tuolumne, and Merced Rivers).[49]
>
> . . . A more natural flow regime is anticipated to improve a number of ecosystem attributes such as (but not limited to): 1) native fish communities; 2) food web; 3) habitat; 4) geomorphic processes; 5) temperature; and 6) water quality.[50]

Adaptive implementation allows this cornerstone to be immediately thrown out the window in favor of engineered flow. Equally, any STM Working Group member can recommend that the Board's Executive Director move water into months outside the February-June period. It is also unclear whether changes become new defaults going forward or whether the defaults revert to original conditions at the end of each water year.

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[48] 2010 Delta Flow Criteria Report, p. 40. Emphasis added. Note that this paragraph also responds to the argument that has been almost universally adopted by water users in the update of the Water Quality Control Plan: that replicating the natural hydrograph is somehow less valid in an altered system. The 2010 Report on the contrary affirms that replicating the natural hydrograph is *all the more important* because of the level of system disturbance.
[49] SED Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives* (February, 2012; updated June, 2016). p. 3-1.
[50] *Id*, p. 3-41.

In his presentation in the January 3, 2017 hearing on the SED, Donald Ratcliff of the U.S. Fish & Wildlife Service showed that averaging flow even over seven days limits the benefits of replicating the unimpaired hydrograph by applying a percent of unimpaired flow from February through June.[51] In opposition to the proposed allowance of the STD Working Group to manage February-June inflow in block flows, we recommend instead that the Board develop operating protocols for operators San Joaquin tributary storage rim dams and downstream dams to release a percent of February-June unimpaired flow on no more than a three-day running average, with a 7-day or 14-day true-up. The Board should consult with project operators and then develop these protocols, and operators should apply these protocols as a critical component of the flow objectives in all months where a percent of unimpaired objective is applied.

3. The SED Unreasonably Excludes an Alternative that Would Require Flow Contributions to the San Joaquin River Upstream of its Confluence with the Merced River.

Chapter 3 of the SED describes the rationale for the Board's selection of the geographic extent in which it proposes to apply Lower San Joaquin River flow objectives. The rationale is worth quoting at length, because its logic is difficult to paraphrase:

> The current flow objective applies only to the SJR at Vernalis. In developing the alternatives, the State Water Board considered whether alternative flow objectives would apply only to Vernalis, just as the current objective, or be extended upstream to some other location. Goals 1 and 2 of the plan amendments are as follows.
>
> > 1. Maintain inflow conditions from the SJR Watershed sufficient to support and maintain the natural production of viable native fish populations migrating through the Delta.
> > 2. Provide flows that more closely mimic the natural hydrographic conditions (including frequency, timing, magnitude, and duration of natural flows) in the LSJR and three eastside, salmon-bearing tributaries —the Stanislaus, Tuolumne, and Merced Rivers—to which these migratory native fish species are adapted.
>
> These goals support the selection of a flow alternative that includes the Stanislaus, Tuolumne, and Merced Rivers, not just Vernalis, because the expanded geographic area supports a variety of critical life history stages. For example, flows that support juvenile rearing in the tributary streams and migration through the Delta are needed to maintain the natural production of SJR fall-run Chinook salmon. Though these goals do not explicitly preclude consideration of alternative flow objectives upstream of the Merced River confluence, that area does not currently support viable native fish populations, and such alternatives would not reduce or avoid impacts. For example, such an alternative would not reduce the quantity of water needed from the Stanislaus, Tuolumne, and Merced Rivers to achieve the goals. Inclusion of the flow alternatives for the SJR upstream of the Merced River confluence would increase the adverse environmental

[51] Presentation of Donald Ratcliff, US Fish and Wildlife Service, January 3, 2017. See slide 4. Available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/workshop_presentations/01032017_usfws.pdf

> effects of the LSJR alternatives in a larger geographic area by reducing the quantity of water available for other uses in areas that rely upon water supplies in the SJR upstream of Merced River confluence. For this reason, alternatives that considered establishing flow objectives in geographic areas other than the LSJR Watershed and the Stanislaus, Tuolumne, and Merced Rivers, were eliminated from further consideration.[52]

Simply put, inclusion of a percentage of unimpaired flow, or some other flow requirement, from the San Joaquin River upstream of Merced River confluence, would add to the benefits in the San Joaquin River at Vernalis that will be achieved with the release of a percent of the February-June unimpaired flow from the three major tributaries to the Lower San Joaquin River. As Tim O'Laughlin of the San Joaquin Tributaries Authority pointed out in his presentation at the Board's December 19, 2016 hearing on the SED in Merced, the 2010 Delta Flow Criteria Report derived its conclusion that 60% of the San Joaquin River's February-June unimpaired flow was needed to protect fish and wildlife based on analysis that counted the unimpaired flow from the entire watershed, including the San Joaquin River upstream of Merced River confluence.[53]

Flows to support salmonids in the reach of the San Joaquin River between Friant Dam and Merced River confluence are specified in the San Joaquin River Restoration Settlement Agreement. However, that Settlement is silent on flows from Friant Dam as a contribution to the Water Quality Control Plan. The logic of the Board that flows upstream of Merced confluence are not needed because they will not benefit existing salmonids upstream of Merced confluence, even though salmonids will soon be present and even though such flows will immediately benefit salmonids and other fish and wildlife downstream of Merced confluence, is tortured. The Board issued a Draft Scientific Basis Report for Phase II of the update of the Water Quality Control Plan in October, 2016. It included analysis of each tributary of the Sacramento River and each "Eastside" tributary in its analysis, with the apparent intent of imposing flow requirements on each of them for purposes of the Water Quality Control Plan. This would leave the San Joaquin River upstream of Merced confluence as the lone exception from which the Board does not require a flow contribution in the Plan update.

4. The Lower San Joaquin Flow Alternatives Proposed in the SED Are Unreasonably Simplistic and Do Not Support Efficient Allocation of Water or Informed Balancing of Beneficial Uses.

California in general, and the San Joaquin tributaries in particular, have an unsustainable agricultural business model. It is a boom and bust cycle built on overallocation of water.[54] Too much delivery in good years creates crisis after 2-3 dry years. This system remains semi-functional only because it diverts water needed for rivers, over-pumps groundwater, or both.

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[52] SED, pp. 3-4 to 3-5.

[53] See 2010 Delta Flow Criteria Report, pp. 119-122. See slides 26-28 of the SJTA presentation, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/sfb_ssjde_bay_delta/12192016_sjta.pdf

[54] The requirement passed by the legislature in 2009 for urban water use, 20% reduction by the year 2020, put that sector of the state's water operations on track to a much better business model.

On the three major San Joaquin tributaries, average annual deliveries are about half of the average annual runoff (Figure 1, below). This level of deliveries is not sustainable and creates permanent stress on the system. The SED accepts this system by pushing the impacts of flow increases to dry and critically dry years. Because the SED accepts, without acknowledging, this baseline condition of overallocation, it presents impacts to water supply as being confined to Dry and Critically Dry years.[55]

The SED's analysis of impacts to water supply is consistent with the way the Board managed the drought in 2014-2016. Because the Board has historically allowed the over-diversion of water from the San Joaquin watershed, the Board found itself in a condition of extreme triage trying to manage water when there was no water to left manage.

Watershed	Median /average annual runoff (TAF)	Average annual agricultural deliveries (TAF)	Average Annual M&I deliveries
Merced	721/884	445 (Merced ID)	
Tuolumne	1514/1851	757 (TID+MID)	30 (MID)
			~225 (SFPUC, BAWSCA)
Stanislaus	922/1100	445 (SSJID+OID) Up to 49 (CSJWCD); may vary	30 (SEWD); may vary

Figure 1: Annual median and average runoff, average agricultural deliveries and average M&I deliveries from the Merced, Tuolumne and Stanislaus Rivers[56]

Over the course of the five hearings the Board held on the SED between November 29, 2016 and January 3, 2017, dry years and dry year sequences were the principal source of controversy regarding water supply impacts of the application of a February-June percent of unimpaired flow. Water user after water user argued that because of water supply impacts in dry years and dry year sequences, the entire construct of flow objectives requiring a February-June percent of unimpaired flow was unworkable and unreasonable.

Setting up the problem in this way at once overstates and understates the water supply impacts of various alternatives for Lower San Joaquin River flow objectives. It overstates them because all impacts appear to come all at once, in dry year sequences. It understates them because it assumes continued diversion in many or most years of unsustainable levels of surface water, particularly for agriculture.

To correct these deficiencies, the SED should have analyzed different rules for flow objectives, diversion allocations, and carryover storage[57] in different water year types. This

[55] Appendix K retains water year types from the previous Water Quality Control Plan and the SED uses them in some analysis, but Appendix K does not specify any particular use for water year types in the current plan.
[56] Source: SED: Merced: p. 2-16; Tuolumne: pp. 2-18 to 2-20; Stanislaus: pp. 2-27 to 2-33. Note: does not include riparian diversions.

would avoid the condition where the February-June percent of unimpaired flow requirement in wetter years is limited by the potential impacts of the application of the same percent in drier years. A graduated schedule would allow implementation of a greater percent of unimpaired flow in wetter years, providing increased instream benefits, and would retain much of the variability and other benefits of the percent of unimpaired construct in drier years, while managing the water balance by adjusting carryover storage and diversion allocations.

In a water year like 2017, 60% of February-June unimpaired flow and reasonable carryover storage would be easily achievable. We would argue against full diversion allocations even in such a year, because it creates an expectation that it will be available in years when water is less bountiful. Instead, we would propose allocating to groundwater recharge the difference between current unsustainable levels of demand and somewhat reduced deliveries.[58] In less abundant Wet and Above Normal years, 60% and reasonable carryover storage are likely to require an increment of reduced diversion allocations to achieve a manageable water balance. For Below Normal water years, the SED should have also analyzed slightly reduced frequency of application of the percent of unimpaired flow, or perhaps a slightly reduced percentage. For Dry years, the SED should have analyzed further reductions in frequency of application of the percent of unimpaired flow and further reductions in diversion allocations, possibly with a change in carryover storage requirements.

Finally, in Critically Dry years and dry year sequences, the SED should have evaluated a series of alternatives for diversion allocations, flow objectives and carryover storage, as a default that is achievable in the vast majority of cases without emergency modification by the Board. In Critically Dry water years and dry year sequences, the system becomes quickly stressed for all uses, even with significant reductions in diversion allocations, and application of the percent of unimpaired flow has a reduced aquatic benefit. This is the specifically limited situation in which the "functional flows" advocated almost universally by water users actually has some justification and utility. To be clear, this is appropriate for Critically Dry years and droughts: the universal substitution of "functional flows" for the percent-of-unimpaired construct, as advocated by water users, would continue the existing degraded condition in which there are effectively two types of water years in the San Joaquin River system: flood years and Critically Dry years.

The SED should also have analyzed the options generally described above for their relative benefits to fish and other instream resources. Generally, reducing the percent of unimpaired flow, thus averaging the benefits across the entire five-month February-June period, is likely to be less beneficial than reducing the number of months in which the percent of unimpaired is applied.

Board staff, at the December 5 technical workshop, argued that it did not "optimize" alternatives in the SED. Staff claimed that the SED likely overestimated rather than underestimated the water supply effects. This apparently is supposed to make the document compliant with CEQA. As we have discussed above, this is a claim that does not answer basic

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[57] The Merced system has limited storage and thus less flexibility for carryover than the Tuolumne and Stanislaus.
[58] This approach would be generally consistent with the urban 20% by 2020 model. See also discussion of groundwater impacts, below.

shortcomings of the document: an agency cannot salvage a CEQA document's lack of clarity and completeness by vaguely overshooting its estimation of impacts. The document does not describe how operators could or would operate to comply with objectives. It does not evaluate the interplay and tradeoffs between the critical elements of water supply availability: flows, diversion allocations, carryover storage, water temperature, and other water quality objectives such as dissolved oxygen and salinity. It does not consider water year types.

The Board cannot base findings and decisions on approximation.

5. The SED Chooses Objectives for Lower San Joaquin River Flow that Will Not Be Protective of Fish and Wildlife.

Page 1 of the Executive Summary of the SED states: "The Bay-Delta is in ecological crisis. Fish species have not shown signs of recovery since adoption of the 1995 Bay-Delta Plan objectives intended to protect fish and wildlife."[59] The 2010 Delta Flow Criteria Report developed new flow criteria for the Delta ecosystem necessary to protect public trust resources. These criteria were intended to halt population decline and increase populations of certain species and represented the best available fishery and hydrologic science to be had in 2010. Nearly all of the scientists who participated in development of the report agreed that mimicking the natural hydrograph is necessary to improve conditions for native fish species and to counter invasive species in the Delta. As required by the State Legislature, the Board's report included the volume, quality and timing of water necessary for the health of the Delta ecosystem.[60] The report identified the following criteria for Delta health:

1. 75 percent of unimpaired Delta outflow from January through June;
2. 75 percent of unimpaired Sacramento River inflow from November through June to protect numerous runs of migratory salmon that use the Sacramento River Basin;
3. 60 percent of unimpaired San Joaquin River inflow from February through June to protect juvenile Chinook salmon during their peak emigration period;
4. Increased fall Delta outflow in wet and above normal years;
5. Fall pulse flows on the Sacramento and San Joaquin Rivers to stimulate migrating fish;
6. Flow criteria in the Delta interior to help protect fish from mortality in the central and southern Delta caused by operations of the state and federal water export pumps;
7. 60 percent of 14-day average of February-June unimpaired flow at Vernalis;
8. 10-day minimum pulse flow of 3,600 cubic feet per second in late October (e.g., October 15 to 26) at Vernalis;
9. Application of the 2006 Bay-Delta Plan's October flows at Vernalis.[61]

The report determined that following these criteria would protect public trust resources on the San Joaquin River and throughout the Delta. The basis for these determinations rested on the Board's findings that these criteria would (1) increase juvenile Chinook salmon outmigration survival and abundance, and provide conditions that would improve population growth and

[59] SED, p. ES-1.
[60] Water Code § 85086(c).
[61] 2010 Delta Flow Criteria Report, pp. 114-123.

achieve a doubling of the current salmon population (salmon doubling requirements contained in Section 3406 et seq. of the CVPIA and Section 6900 of the California Fish and Wildlife Code) in more than half of all years; (2) provide flows for adult Chinook salmon that would decrease straying, increase dissolved oxygen concentrations in the San Joaquin River mainstem through the Stockton Deep Water Ship Channel, reduce water temperatures, and improve olfactory homing fidelity; and (3) provide adult Chinook salmon attraction flows.[62]

The report indicated that salmon are the most sensitive species for which it developed public trust-protective flow criteria, as all three of its San Joaquin River inflow criteria directly relate to the sensitivities of salmon populations to changes in and timing of flow through the Bay-Delta Estuary. But despite the 2010 report's extensive background and recent flow recommendations to protect fish and wildlife, the SED largely dismisses the 2010 report and proposes flow objectives for the lower San Joaquin River that are not protective of fish and wildlife.

The 2010 Delta Flow Criteria Report states that altering the flows in the lower San Joaquin River to create a more natural flow regime would improve a number of ecosystem attributes such as (but not limited to): 1) native fish communities; 2) food web; 3) habitat; 4) geomorphic processes; 5) temperature; and 6) water quality.[63] Major researchers involved in developing ecologically protective flow prescriptions concur that mimicking the unimpaired hydrographic conditions of a river is essential to protecting populations of native aquatic species and promoting natural ecological functions.[64]

The San Joaquin River Basin's hydrology has been dramatically altered by water development over the period 1984-2009. In comparing unimpaired with observed (measured) flow conditions for the Basin's rivers, it is clear that flow conditions have been greatly reduced on the major tributaries by water project operations. Operations during this time period reduced median annual water flow volumes at Vernalis by 53% compared to unimpaired flow, and have reduced median spring flows at Vernalis in April, May and June by 74%, 83%, and 81% respectively.[65] Estimates of flows needed to double salmon production range from 51% to 97% of unimpaired flow, with a greater percentage of unimpaired flow needed in drier years than wet years.[66]

The SED fails to provide a reasoned analysis to justify the reduction in flow for the San Joaquin River at Vernalis from the 60% of February-June unimpaired flow it found in 2010 was necessary to protect public trust resources to the 30% to 50% range of flow, beginning at 40%, that Appendix K, Table 3 recommends. The SED makes no showing in Chapter 19 or elsewhere that the recommended Lower San Joaquin River flow objectives can attain the outcomes alleged for them. The water temperature modeling in Chapter 19 of the SED is predicated on the water balance modeling whose flaw we have described above. The floodplain inundation analysis in

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[62] 2010 Delta Flow Criteria Report, p. 133, Table 22.
[63] Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, p. 3-41
[64] Id.
[65] Appendix C, *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*, p. 3-2.
[66] Id., p. 3-51

Chapter 19 shows little benefit, and does not specify a duration of inundation in its tables; duration is a fundamental component of the biological benefit.[67] The SalSim modeling is universally dismissed and disregarded as flawed, and the both the Board in several hearings and the Department of Fish and Wildlife[68] have disavowed it.

The 2012 version of the SED recommended a minimum year-round Vernalis flow of 2000 cfs, based on the need to maintain dissolved oxygen at the Port of Stockton. The present SED proposes, without explanation, 1000 cfs, which the STM Working Group can recommend that the Board's Executive Director increase or decrease by 200 cfs.

Although the Board qualified its 2010 flow criteria for the San Joaquin River by stating that "these flow criteria do not consider any balancing of public trust resource protection with public interest needs for water," the SED makes no statement or explanation of the method Board staff employed or that it recommends that the Board employ to balance the public trust resources.

E. The SED Fails to Adequately Provide the Methodology and the Analysis to Support the Board's Affirmative Duty to Protect the Public Trust.

As noted above, governments have a permanent fiduciary responsibility and obligation to protect the public trust, which is defined as the people's common heritage of streams, lakes, marshlands and tidelands and which can only be surrendered in rare instances when abandonment of that right is consistent with the purposes of the trust. The public trust is essentially a property right in healthy and vibrant waterways belonging to all Californians. Moreover, the Delta and its tributary rivers are national treasures belonging to all citizens of the United States.

Pursuant to legislative direction, the State Board conducted an intensive year-long proceeding in 2010 to determine flows in the Delta and its two major tributary rivers necessary to protect public trust resources. The resulting 2010 Delta Flow Criteria Report found that "Delta flows are insufficient to support native Delta fishes" and that "60% of unimpaired San Joaquin River inflow from February through June" was necessary to protect public trust resources. The Board made clear that the balancing public trust resources with consumptive water uses would occur at a later date. Also, pursuant to legislative direction, the California Department of Fish and Wildlife conducted an extensive proceeding that resulted in the 2010 DFW Flow Report, which echoed the conclusions of the State Board.

Members and staff of the State Board have clearly stated that the SED and State Board Phase I proceeding will incorporate the necessary public trust balancing between competing uses of water. Unfortunately, the SED's recommended balancing is grossly deficient, and the SED as a whole is insufficient to support balancing by the Board. The SED fails to describe or discuss the rationale and methodology employed in balancing. While the SED quantitatively analyzes economic costs to agricultural and selected M&I water users, it either ignores or analyzes the economic benefits of healthy waterways – including ecosystem services, commercial and sport

[67] Id., pp. 19-63 to 19-65.
[68] Oral testimony of Dean Marston, DFW, at the January 3, 2017 Board hearing on the SED.

fisheries, recreation and public health as well as the contingent value of a healthy river/estuary – with a only general qualitative assessment. The failure to quantitatively analyze and describe both sides of the benefit/cost ledger renders the economic analysis insufficient as a balancing document.

Having expended considerable effort and resources in quantitatively analyzing the costs of providing increased flows, the SED essentially limits its assessment of the benefits side of the ledger to the "potential use and non-use benefits associated with supporting and maintaining sustainable population of Chinook salmon in the three eastside tributaries."[69] The SED overlooks fish species other than salmon, including Delta fisheries. The SED simply summarizes benefits to commercial and sport harvest and non-use values associated with salmon restoration for each of the Lower San Joaquin River flow alternatives by saying: "Effects cannot be reliably quantified but would be expected to be beneficial and substantial… ."[70]

The SED summarizes the conclusions of four salmon restoration studies on other rivers of non-use values: Upper San Joaquin, Columbia, Elwha and Klamath Rivers.[71] However, the SED notes that an equivalent effort on the project-area waterways would require designing and conducting specific surveys and studies.[72] Again, with respect to recreation activity-related economics, the SED notes that it does not quantify effects on in-river values but expects them to be generally unchanged or slightly greater.[73] In other words, the authors of the SED were willing to expend effort and resources in quantifying the costs of restoration to water users but not willing to make a similar effort to quantify the benefits of protecting and restoring public trust resources.

Public trust values cover far more that salmon restoration. They include ecosystem services, which encompass such things as clean water and the decomposition, detoxification or dilution of wastes; public health benefits; cultural values such as spiritual and recreational benefits (beyond fishing); avoided treatment or infrastructure replacement costs; hedonic pricing such as improved property values along healthy waterways; and improved biodiversity within watersheds. Public trust values also include the contingent valuation of healthy ecosystems, which are not limited to fishing or salmon restoration. The public trust balancing at Mono Lake found that the value of restoring the lake was between 56 and 132 times the value of the water lost to Los Angeles.

The SED fails to acknowledge, discuss or use the numerous state and federal guidelines and guidebooks on economic analyses that are routinely used by the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, USEPA and the Department of Water Resources (DWR) in evaluating benefits and costs pertaining to public trust resources. For example, federal agencies routinely use *The Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* ("P&G") that was recently updated. USEPA uses the *Guidelines for Preparing Economic Analyses* and report *Valuing the Protection*

[69] SED, Chapter 20, P. 20-70
[70] SED Chapter 20, Table 20.2-4, p. 20-8
[71] Id,, Table 20.3.5-3, p. 20-71)
[72] Id., p. 20-70.
[73] Id., Table 20.2-5, p. 20-9.

of Ecological Systems and Services. Economic analyses conducted by DWR must conform to the federal P&G; in addition, DWR has developed its own *Economics Analysis Guidebook*, as well as a series of guidelines, including *Ecosystem Valuation Methods, Natural Floodplain Functions and Societal Values, Middle Creek Flood Ecosystem Restoration Project Case Study: Benefit and Cost Analysis* and *Floodplain Management Benefit and Cost Analysis Framework*. There are also numerous peer-reviewed scientific papers discussing how to properly conduct a benefit/cost analysis that addresses differences in net economic values: economic benefits minus economic costs across a range of alternatives, including the economic significance of natural resources and associated ecosystem services.

As an attachment to our March 29, 2013 comment letter on the 2012 SED, we submitted a comprehensive report on the previous draft of the SED on balancing the public trust prepared by ECONorthwest and titled, *Bay-Delta Water, Economics of Choice*.[74] ECONorthwest is a recognized national expert in the economic value of public trust resources. The report is virtually a how-to guide in valuing public trust resources and addresses the relevant scope of public trust balancing, including economic analyses, risk and uncertainty, ecological services, best practices, allocation of scarce resources among competing demands and environmental justice concerns. It is apparent that the authors of the SED either didn't read or failed to consider the recommendations in that report.

Balancing the public trust is, at best, extremely difficult in a vastly overappropriated watershed where excessive water diversions have degraded and substantially diminished public trust assets. In California, water belongs to the people, and the right to use water is usufructuary and not possessory. Put in the context of rights to water, a user of water must respect the rights and interests of others, including the peoples' property right to robust fisheries, clean water and healthy ecosystems. The SED fails to acknowledge or quantitatively analyze the full range of public trust resources in the project area and, consequently fails to conduct a defensible balancing of public trust benefits and resources and the existing consumptive uses of water. This violates both CEQA's requirements for analysis and fair disclosure and the State Board's legal responsibility to adequately and fairly balance the public trust.

F. The SED and Appendix K Improperly Rely on Adaptive Management.

Appendix K of the SED establishes a Program of Implementation that will effectuate the project's "Adaptive Implementation," which is simply another phrase for adaptive management.[75] Adaptive management has become increasingly popular among decision makers in recent decades because it enables decision makers to delay or avoid making difficult and politically sensitive decisions.

As described is sections above, the SED uses the concept of "adaptive implementation" to avoid defining the project and to avoid evaluating the impacts of the combined effects of Lower San Joaquin River flow objectives, changes in diversion allocations, and prospective carryover storage requirements. The State Board's 2010 Delta Flow Criteria Report found that 60% February through June unimpaired flow is *minimally* necessary to protect public trust

[74] See CSPA et al March 29, 2013 comments on the 2012 SED, Appendix C.
[75] See Appendix K, pp. 29-34.

resources. The Department of Fish and Wildlife's 2010 Quantifiable Biological Objectives and Flow Report echoed this conclusion.[76] Yet the SED makes no defensible technical or legal justification for its preferred requirement – 40% of February-June unimpaired flow, with an adaptive range of 30% to 50% – as adequate for the protection of public trust resources. Instead, the SED relies on adaptive management to provide the justification at an unspecified time in the future.

Adaptive management has a long and checkered history. The National Research Council reviewed the Bay Delta Conservation Plan (BDCP) and prepared a report titled, "A Review of the Use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan." It observed:

> Despite numerous attempts to develop and implement adaptive environmental management strategies, many of them have not been successful (Gregory et al., 2006; Walters, 2007). Walters (2007) concluded that most of more than 100 adaptive management efforts worldwide have failed primarily because of institutional problems that include lack of resources necessary for expanded monitoring; unwillingness of decision makers to admit and embrace uncertainties in making policy choices; and lack of leadership in implementation. Thus many issues affecting the successful implementation of adaptive management programs are attributable to the context of how they are applied and not necessarily to the approach itself (Gregory et al., 2006). In addition, the aims of adaptive management often conflict with institutional and political preferences for known and predictable outcomes (e.g., Richardson, 2010) and the uncertain and variable nature of natural systems (e.g. Pine et al., 2009). The high cost of adaptive management, and the large number of factors involved also often hinder its application and success (Lee, 1999; NRC, 2003).[77]

Adaptive management in large, highly complex ecosystems is extremely difficult, time-consuming and expensive. In highly stressed and overappropriated watersheds where high-value resources, funding constraints and sharp political conflict over management choices are involved, the difficulty increases substantially. A high degree of risk and uncertainty increases the difficulty exponentially.

The quarter-century track record of adaptive management in the Delta – from CalFed to Vernalis Adaptive Management Plan, Interagency Ecological Program, state and federal biological opinions and associated technical work groups, and myriad State Board proceedings – has been one of utter failure. Managers and decision makers have routinely rejected the "adaptive" recommendations made by scientists and technical support teams. Resource and regulatory agencies have failed to adopt and implement recommended criteria and have failed to enforce existing criteria. Financial resources have been lacking. Meanwhile, Delta fisheries have collapsed. As adaptive management programs have been stacked on top of each other, native fisheries and lower trophic orders have declined by one to two orders of magnitude and now face extirpation.

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[76] DFW 2010 Report, op cit.

[77] National Research Council, *A Review of the Use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan*, 2011, p. 6. Available at: https://www.nap.edu/download/13148

Taken together, the vast suite of water quality control plans and water rights decisions by the SWRCB over the last decades essentially constitutes an adaptive management process. CalFed was an elaborately structured water planning and adaptive management program. The CalFed Record of Decision mentions adaptive management 132 times. The array of Biological Opinions of USFWS and NMFS and the CESA permits of CDFW over the past two decades comprise a broad adaptive management scheme. Indeed, the Reasonable and Prudent Alternatives (RPAs) of the Biological Opinions are implemented through adaptive management: the Water Operations Management Team, Smelt Working Group, Delta Operations for Salmonids and Sturgeon Work Group, Sacramento River Temperature Task Group and other groups. Unfortunately, senior managers and decision makers have routinely ignored and rejected the explicit recommendations of the scientists, biologists and technical review teams. The Recovery Plan for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon and Central Valley steelhead is based upon adaptive management, as is the Final Restoration Plan for the Anadromous Fish Restoration Program. The Vernalis Adaptive Management Program was a poignant example of adaptive management failure in which water agencies failed to provide necessary flow to complete the program. The Interagency Ecological Program and its fifteen Project Work Teams is an adaptive management program, as is the Collaborative Science and Adaptive Management Program. A broad adaptive management program was an essential component in the Blue Ribbon Task Force's Delta Vision Report: it was mentioned forty-one times in the Delta Vision Strategic Plan. From its inception, the BDCP envisioned an extensive adaptive management program. Ten years later, after BDCP morphed into California WaterFix, it still has no final defined and recommended detailed adaptive management program that has been approved by participating agencies and no agreement to extensively fund such a program.

Appendix K's failure to identify the specific components and measures of the adaptive management process deprives the public of necessary information on which to base an opinion of the sufficiency or likely success of implementation. This violates the most basic public disclosure, analytical and mitigation requirements of CEQA. Appendix K lacks measurable performance measures, milestones and funding mechanisms to guide and ensure the success of the proposed adaptive management program. It does not discuss and analyze risk and uncertainty. It pushes development of goals and objectives into the future, and abdicates the Board's responsibility to develop them to the adaptive management group itself. By contrast, the USEPA established a performance measure in its 1995 Bay-Delta Plan based on the ratio of tagged out-migrating salmon that reached Chipps Island.

Appendix K provides no guidance for governance within the STM Working Group and does not define how that group or the Board will evaluate and enforce goals and quantitative objectives. Participation in the STM Working Group is limited to staff from the Department of Fish and Wildlife, National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the Board, plus representatives of water users on the affected rivers and other representatives deemed appropriate by the Executive Director.

Without public scrutiny, accountability or subsequent environmental analysis, and with no defined or required formal public process before the Board, the STM Working Group and the

Board's Executive Director will be able to reduce flows and manage reservoir storage operations at levels that are likely to result in significant, redirected and unavoidable impacts that the SED neither discloses nor analyzes. This back room operation will deprive other users of water of oversight just as it will deprive individuals and organizations whose mission is to advocate for the public interest.

G. The Analysis of the Proposed Relaxation of South Delta Salinity Standards Violates CEQA's Requirement for Analysis and Fair Disclosure.

The southern Delta is identified as impaired because of electrical conductivity on the California Integrated Report (Clean Water Act § 303(d) List/305(b) Report). The SED proposes to increase the existing 0.7 dS/m April-August salinity limit in the southern Delta by 43% based upon a flawed assessment of potential impacts to agriculture. It ignores the potential impacts that increasing salinity would have on aquatic life and aquatic and riparian vegetation.

The SED's assessment of potential salinity impacts to agriculture is solely based on a seven-year old report prepared by Dr. Glenn Hoffman titled *Salt Tolerances of Crops in the Southern Sacramento-San Joaquin Delta*.[78] Dr. Hoffman used 30-year old laboratory data on the salt tolerance of bean varieties that are no longer relevant and that ignored effects on different stages of crop life. He also improperly employed data from subsurface drains in developing leaching fractions, and rejected more conservative modeling results. He candidly observed, "With such an important decision as the water quality standard to protect all crops in the South Delta, it is unfortunate that a definitive answer cannot be based on a field trial with modern bean varieties."[79] And he recommended that field studies be conducted to determine: a) the salt tolerance of beans for local conditions and for new varieties grown today that may have different tolerances; b) the salt tolerance of beans at different growth stages; and c) actual leaching fractions.

Only one of the five peer-reviewers of the State Board's *Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives* (Appendix C) felt confident enough to comment on the Hoffman Report. The selection of only one reviewer with sufficient expertise to review Dr. Hoffman's report fails to meet the legal requirements of Health & Safety Code § 57004 regarding peer review applicable to State Board technical reports. However, the single peer review by Dr. Grismer, while agreeing with Dr. Hoffman's conclusions *based upon reported leaching fractions*, noted that additional studies were needed, in part because the data was old and based on greenhouse studies on bean varieties unlikely to be used commercially today.

Subsequent to the Hoffman Report, the South Delta Water Agency arranged for a series of studies and field tests to better determine actual leaching fractions in the South Delta.[80] The

[78] SED Appendix E.
[79] Id., p. 98.
[80] We incorporate by reference the comments on salinity of South Delta Water Agency, including the presentation at the December 16, 2016 hearing in Stockton by Dr. Michelle Leinfelder-Miles entitled *Leaching Fractions Achieved in South Delta Soils under Alfalfa Culture* which is available at:

results, reported by Michelle Leinfelder-Miles of the University of California Cooperative Extension, demonstrate that actual leaching fractions in the South Delta are significantly below the levels assumed by the Hoffman Report. Where the Hoffman Report assumed leaching fractions of 15-20% or higher, the new field studies reveal that actual leaching fractions in many areas are 5% or lower. Where the Hoffman Report assumed applied water salinity was .7 dS/m, actual applied water ranged from 1.0-2.0 dS/m in many locations. The new information establishes that, in areas with low leaching fractions, salt is accumulating in the root zone at levels that can reduce crop yield. Inexplicably, the SED ignores the new field data provided by South Delta Water Agency. The Board should not establish new salinity standards and should certainly not relax them until the completion of necessary studies incorporating the new information and analysis of these studies in a revised SED.

The SED fails to incorporate and analyze all relevant field data on leaching fractions and salinity uptake by crops in the South Delta. Failure to utilize new and relevant field data to evaluate the impacts of salinity to agricultural crops would violate CEQA's requirements for analysis and fair disclosure.

There are a number of fish species in the south Delta and San Joaquin River that are potentially adversely affected by salinity: for example, striped bass and splittail. It's not that there is an inadequate analysis of salinity impacts to fisheries: *there is simply no analysis!* The SED must analyze the salinity impacts of project alternatives to beneficial uses applicable to aquatic species in the Delta and San Joaquin River.

The SED ignores the 1995 federally promulgated salinity standards for striped bass and splittail spawning and migration at 40 CFR 131.37. These standards establish a salinity standard of 0.44 micro-mhos between 1 April and 31 May for Vernalis, Mossdale, Brandt Bridge to Jersey Point when the San Joaquin River index is greater than 2.5 MAF. The studies USEPA relied on in establishing salinity criteria protective of the migration and spawning beneficial uses of striped bass and splittail are still applicable.[81]

The SED contains no analysis or survey of freshwater invertebrates, especially their eggs and sensitive life stages. Zooplankton is a critical source of food to numerous fish species. Different zooplankton species tend to inhabit freshwater, low salinity zones or high salinity zones. Native copepod and Mysid populations have plummeted. The same applies to the

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/workshop_presentations/12162016_leinfelder-miles.pdf

[81] Turner, J.L. 1972. Striped Bass Spawning in the Sacramento and San Joaquin Rivers in Central California from 1963 to1972. Calif. Fish and Game, 62(2):106-118: Turner, J.L. and Harold K Chadwick. 1972. Distribution and Abundance of Young-of-the-Year Striped Bass, Morone saxatilis, in Relation to River Flow in the Sacramento-San Joaquin Estuary. Anadromous Fisheries Branch, CDFG: Fraley, T.C. 1966. Striped bass, Roccus Saxatilis, Spawning in the Sacramento-San Joaquin Rivers During 1963 and 1964: Radtke, L.D. and Jerry L. Turner. 1967. High Concentrations of Total Dissolved Solids Block Spawning Migration of Striped Bass, Roccus saxatilis, in the San Joaquin River, California. Transactions of the American Fisheries Society. 96:4, 405-407: Radtke, L.D. 1966. Distribution of Adult and Subadult Striped Bass, Roccus Saxatilis, in the Sacramento-San Joaquin Delta: Turner J.L and Timothy C. Farley. 1971. Effects of Temperature, Salinity, and Dissolved Oxygen on the Survival of Striped Bass Eggs and Larvae. Calif. Fish and Game 57(4):268-273. 1971: See also, SWRCB. 1988. WQCP excerpts and SWRCB. 1991. Draft WQCP excerpts.

phytoplankton community. There is no acknowledgement, analysis or discussion in the SED on potential salinity impacts to the food web.

The SED fails to analyze the potential impact of relaxing salinity standards on fish and lower trophic orders in the Delta and San Joaquin River. Failure to evaluate these impacts of salinity to aquatic life violates CEQA's requirements for analysis and fair disclosure.

With respect to native plant species, the SED identifies listed plants and acknowledges that no field surveys were conducted. Again, it is not that there is an inadequate analysis of the impacts to riparian and channel vegetation in the South Delta or San Joaquin River, it is that *there is simply no analysis!* The Delta was historically dominated by freshwater, and the estuary was where the mixing of fresh and salt waters occurred.

There are several natural divisions within the Delta and lower San Joaquin River system. Historically, the southern and eastern Delta was dominated by freshwater conditions and once supported myriad native freshwater plant species. A few of these species include common tules (*Scirpus acutus, S. californicus*), cattails (*Typha spp*.), common reed (*Phragmites communis*), swamp knotweed (*Polygonum coccineum*), marsh bindweed (*Calystegia sepium*), bur-reed (*Sparganium eurycarpum*), cinquefoil (*Potentilla anserina*), twinberry (*Lonicera involucrata*), dogwood (*Cornus stolonifera*), buttonwillow (*Cephalanthus occidentale*), and willows (*Salix lasiolepis, S. lucida*). This wetland community was once very common, and remnants of these communities still can be found on channel islands and along the water side of levees. Others grow in the water itself. Some of these species, like twinberry (*Lonicera involucrate*), are extremely sensitive to salt.

The SED fails to analyze the potential impact of relaxing salinity standards on native plant species in the Delta and San Joaquin River. Failure to evaluate the impacts of salinity to native aquatic and riparian plant communities violates CEQA's requirements for analysis and fair disclosure.

H. The SED understates potential economic impacts of Lower San Joaquin River flow objectives to hydropower, and does not adequately analyze possible mitigation.

The analysis of hydropower in the SED centers on potential impacts of Lower San Joaquin River flow objectives to grid reliability, and concludes that such impacts are less than significant.[82] However, while this is one potential impact, there are several others that the SED does not sufficiently analyze.

Generally, these impacts are related to a seasonal shift in generation. As the SED shows in figures J-2a and J-2b, the Lower San Joaquin River flow objectives will shift generation from the summer to the spring. The SED also accounts for changes to monthly generation based on changes in head due changes in reservoir elevation, and perhaps to times when required flows exceed turbine capacity.

[82] SED Appendix J, p. J-23.

Table 20.3.4-1 shows the basis for price comparison that the SED uses in calculating the differences between baseline generation and generation under project alternatives. However, the price basis is for overall hourly prices. This undervalues that portion of hydropower that provides ancillary services (load following, regulation up or down, spinning reserve, etc.), which are widely considered to be valued about 25% higher than baseload power. In addition, ancillary services are priced in terms of availability rather than actual performance, so that there may be additional value to ancillary services than the hourly value because water promised for generation when needed is not always deployed.

The economic analysis in Chapter 20 misses this aspect of hydropower revenue. Because of the Lower San Joaquin River flow objectives, there may be additional times during the spring when operators on each of the tributaries are unable to provide ancillary services because they are running at full baseload capacity or close it, thus having no flexibility to increase or decrease generation. There may also be less flexibility to provide these services at some times during the summer when there is less water available for generation than baseline because operators are delivering less water for irrigation.

For those hydropower facilities that provide power to the California Independent Service Operator (CalISO), there is an additional potential economic impact of the Lower San Joaquin River flow objectives. During the spring in some years, particularly wet years, there are times when the baseload price for hydropower actually goes negative, because CalISO foresees or has excess generation on line and is trying to keep generation off the grid. CalISO could mitigate this economic impact by factoring increased San Joaquin tributary hydropower generation as part of its seasonal planning and in its spring market operations, noting that the importance of this issue will likely increase if the Board establishes additional spring flow objectives in the Sacramento River watershed in the future. The Board should exercise its authorities and work with CalISO and perhaps with Pacific Gas & Electric Company to plan for and mitigate this likely perturbation in California's energy markets.

I. The SED Appropriately Discloses Impacts to Groundwater and Identifies Overallocation of Water as the Source of Groundwater Overdraft.

Agriculture in the irrigation districts served by the Lower San Joaquin River and its three major tributaries has maintained a veneer of sustainability by supporting the overallocation of surface water with groundwater pumping. Restoration of protective flows for rivers and the Sustainable Groundwater Management Act (SGMA) are not the cause of overallocation: they just daylight it.[83]

Many water users have objected to the SED's treatment of groundwater, and have criticized the SED and the Board for suggesting that water districts and agricultural water users in general would mitigate the loss of surface water by pumping additional groundwater. However, based on both long-term and recent practice, the SED is correct to assume that

[83] See Section II(A), supra and December 16, 2016 presentation of Chris Shutes, Slide 3 http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/sfb_ssjde_bay_delta/12162016_cspa_shutes.pdf. For statistics on existing conditions of overdraft in the project area, see SED, Table 9-4.

agricultural water users will increase groundwater pumping if the Lower San Joaquin River flow objectives reduce surface water available for irrigation. The SED, in Chapter 9, sets a threshold of significance for impacts for such increased reliance on groundwater, evaluates the likelihood that irrigators will pump to surpass that threshold, and concludes that impacts will be significant and unavoidable.[84]

The general argument of the water users appears to be that groundwater pumping will be less available in the future as a means of mitigating reductions in the allocations of surface water. Stating the issue somewhat extremely, Merced Irrigation District, in its December 19, 2019 presentation at the Board's hearing in Merced, argued that the "SED does not comply with the law" for the following reason: "The Project will result in direct violations of Sustainable Groundwater Management Act (SGMA) by requiring increased pumping at the exact time that SGMA limitations and restrictions on groundwater use will be imposed."[85]

While this statement overreaches by suggesting that the SED would explicitly require an illegal action, it reflects the general sense among the San Joaquin water users that reducing water use is just not an option. It is like a business that complains it cannot pay off its [groundwater] line of credit while continually overdrawing the [surface water] checking account and relying on the line of credit to make up the shortfall. The circular logic is broken when the SGMA bank begins to demand repayment of the loan on the line of credit: at a certain point, a responsible business needs to reduce spending.

The SED is actually quite sober and direct in acknowledging both the overallocation of groundwater in the project area and *the responsibility of local agencies to correct it*. In this regard, the SED is more explicit and does a better job in analyzing the overallocation of groundwater in the project area than in analyzing the overallocation of surface water:

> SGMA is now the state's primary sustainable groundwater management law. Under the SGMA framework, local agencies are tasked with protecting and managing high and medium priority groundwater basins with state intervention to begin by specified dates if local agencies are unwilling or unable to manage. The SGMA deadlines for state intervention are still prospective; therefore, State Water Board mitigation to protect the groundwater basin from the indirect impacts of the LSJR alternatives is infeasible at this time, *but mitigation under local authorities is both feasible and required.*
>
> Possible mitigation measures to reduce or avoid any potential effects include those listed below.
>
> 1 Identify the basin's sustainable yield and implement enforceable groundwater management measures (for maximum pumping or minimum water levels) *so that reductions in groundwater pumping would result if certain thresholds are met.*

[84] SED, pp. 9-5 to 9-7.
[85] Merced ID December 19, 2016 presentation to the Board, slide 4. http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2016_sed/docs/sfb_ssjde_bay_delta/12192016_mercedid.pdf

l Establish water conservation measures, such as increased efficiency for municipal and industrial uses or conversion of irrigated land to crops that require less water, such that reductions in groundwater pumping would result.

l Establish a conjunctive water management program that would divert surface water during non-irrigation months (e.g., October–April) during wet years into unlined canals and designated fields to recharge the groundwater basin.

Thus, at this time, local agencies are vested with the mandatory duty to achieve sustainable groundwater management, which includes not causing undesirable results such as significant and unreasonable reduction of groundwater storage and degradation of water quality. Therefore, these local agencies with authority over the Extended Merced Subbasin can and should exercise their full authorities to address substantial depletion of groundwater supplies and water quality degradation, both under SGMA and their police powers. *Under that authority, they can and should also implement those mitigation measures identified above. Doing so would prevent groundwater depletion and water quality impacts, mitigate those impacts, or both*.[86]

While we are very skeptical that the SED's proposed mitigation of diverting water to canals and fields is efficient enough to pass the test of waste and unreasonable use, we completely agree that the various groundwater basins (and surface watersheds) need to bring water use into a condition of sustainable balance.

In addition, it is important to note that in both the Turlock and Modesto subbasins, the primary source of groundwater recharge is the result of diverted for irrigation that is not directly used by plants. As the overlying irrigators implement efficiencies in surface water use in response to reduced levels of surface water allocation that are more balanced with instream uses and carryover storage, the groundwater line of credit will be further reduced. Irrigation districts in the project area will need to construct and bring on line more efficient and directed infrastructure for groundwater recharge. Merced ID is currently the most advanced with such infrastructure, but it will need to step up its efforts, as will its counterparts on the Tuolumne and the Stanislaus.

In summary, the SED does not use the alternative of groundwater pumping to understate the impacts of reduced allocations of surface water. Rather, the SED simply acknowledges that water users will push the limits of groundwater pumping to the degree that groundwater regulators allow it. It is true that the SED elsewhere does not sufficiently analyze the water supply impacts of reduced diversion surface water allocations that implementation of the Lower San Joaquin River Flow Objectives will require. However, the SED is direct and clear in stating that increased groundwater pumping is not the magic solution.

The chief complaint of water users is that SED's analysis of groundwater does not offer a substitute water supply for reduced diversion allocations of surface water. The concern of water

[86] SED, p. 9-61. Emphases added.

users appears to us to be less a concern with the SED than a concern that they might actually have to change their business model to accommodate reducing their overall use of water.

III. THE SED DOES NOT COMPLY WITH THE REQUIREMENTS OF THE FEDERAL CLEAN WATER ACT.

A. Appendix K of the SED Proposes Water Quality Objectives that Will Not Fully Protect Beneficial Uses.

The primary purpose of water quality control planning under the CWA is to prepare or develop comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable water and groundwater and improving the sanitary condition of surface and underground waters. In the development of such comprehensive programs, "due regard shall be given to the improvements which are necessary to conserve such waters for the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such waters for public water supply, agricultural, industrial, and other purposes."[87] The Board fails to consider new water quality objectives for the most sensitive beneficial uses in the Bay-Delta Estuary under the federal CWA and its implementing regulations administered by the US Environmental Protection Agency (hereinafter "EPA").

The goals of the CWA include restoring and maintaining the chemical, physical, and biological integrity of the nation's waters through the elimination of discharged pollutants; protecting and propagating fish, shellfish, and wildlife; prohibiting discharge of toxic pollutants; and to recognize, preserve, and protect the primary responsibilities and rights of states to prevent, reduce, and eliminate pollution, plan the restoration, preservation, and enhancement of land and water resources. Research priorities funded under the CWA are intended to foster prevention, reduction and elimination of pollution in the waters of the United States. The heart of water quality control under these laws is, first, the designation of the beneficial uses to be protected, and, second, the setting of standards, criteria, and objectives that provide reasonable protection for those beneficial uses.

The Board is obligated by the CWA to operate a "continuing planning process," by which the Board submits any revisions or new water quality standards to the EPA Administrator for review. Such standards are to consist of "designated uses" and water quality criteria or objectives that represent the level of protection for the beneficial use. These standards are intended to protect the public health and enhance water quality while taking into consideration the needs of public water supplies, fish and wildlife, recreation, and agricultural and industrial uses.[88] Under Porter-Cologne, beneficial uses may include domestic, municipal, agricultural and industrial water supplies; power generation; recreation; aesthetic enjoyment; navigation; and

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[87] 33 USC § 1252

[88] 33 U.S.C. 1313 (c)(2)(A). ("Enhance" means to "intensify, increase, or further improve the quality, value, or extent of" something. One meaning of "propagate" is to "cause (something) to increase in number or amount." "Restore" can mean to "return (someone or something) to a former condition, place, or position."). In general, the plain language of Clean Water Act policies on protection of beneficial uses is not merely intended to maintain water quality but to increase or improve water quality as well as to return water quality to former conditions of chemical, physical, and biological integrity.

preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.[89] Since 1991, the Board has designated seventeen specific beneficial uses of water in its Bay-Delta Estuary water quality control plans, including recreation and preservation and enhancement of fish and wildlife resources.[90]

Thus, in determining the amount of water available for appropriation, the Board must take into account the amount of water needed to remain in the source for protection of beneficial uses.[91] Despite this charge, the recommended objectives in the SED would not enable the Board to use its water quality control powers to materially improve water quality in the South Delta and the lower San Joaquin River. On the contrary, the Board's proposed actions would relax existing standards and would maintain insufficient flow objectives for fish and wildlife, diminishing water quality and further harming the Delta.

The SED recommends a February-June flow objective for the Lower San Joaquin River of 30%-50% of unimpaired flow that is well below the 60% flow that the Board identified in 2010 as protective of fish and wildlife. The SED should have first identified the various water demands for beneficial uses, which of the beneficial uses are the most sensitive, the increment of flows available for riparian and appropriative consumptive use, and then proposed flow objectives in accordance with those findings. The Board failed to comply with this method at each step. First, the Board has not designated beneficial uses for which its proposed southern Delta salinity objectives are intended to protect. Second, the Board proposes Lower San Joaquin River flow objectives that maintain the status quo, albeit through a new method of regulation. Third, the Board fails to include an analysis of water availability or to take full account of competing demands for water from all beneficial uses in that context. Finally, the Board fails to set objectives adequate to address water quality as it relates to dissolved oxygen and water temperature.

Old River experiences frequent fish kills caused by low dissolved oxygen, which has long been known to the Regional Board.[92] Dissolved oxygen results collected at the real-time monitoring station in Old River at Tracy Wildlife Association reveals that dissolved oxygen levels cycled as low as 0.5 mg/l mid-April through mid-August of 2012. The Board must establish specific dissolved oxygen standards in Old River to protect beneficial uses.

In order to begin to mimic natural hydrologic conditions in the estuary, water temperature must be taken into account. Despite this logical analysis, the SED fails to propose objectives that protect the identified beneficial uses of cold fresh water habitat; migration of aquatic organisms; spawning, reproduction and/or early development of fish; and rare, threatened or endangered species' habitats from elevated temperatures. The San Joaquin River (Merced to Delta

[89] California Water Code §13050(f).
[90] These beneficial uses include: municipal and domestic supply, industrial service supply, industrial process upply, agricultural supply, groundwater recharge, navigation, contact and non-contact water recreation, shellfish harvesting, commercial and sport fishing, warm fresh water habitat, cold fresh water habitat, migration of aquatic organisms, spawning, reproduction and/or early development of fish, estuarine habitat, wildlife habitat, and rare, threatened or endangered species' habitats. See also California Water Code §1243.
[91] California Water Code Section §1243.5.
[92] Several years ago, CSPA took staff from the Central Valley Regional Water Quality Control Board (including Mark Gowdy) on a trip on Old River and showed them a massive fish kill caused be anoxic conditions.

boundary), the lower Stanislaus, the lower Tuolumne and the lower Merced Rivers are identified by the CWA as impaired waterbodies because of elevated temperatures.[93] The SED analyzed the impacts resulting from changes in exposure of fish to stressful water temperatures (AQUA-4) of each of the alternatives and concluded that lower flows increased significant impacts while increased flows decreased impacts. While CEQA is served by a comparison of the relative significant impacts between the considered alternatives, the federal CWA is not. The SED is reviewing a water quality control plan developed pursuant to the CWA, and the CWA requires the protection of identified beneficial uses.

Tables 7-20 a-d through 7-24 a-d of the SED show masses of exceedances of EPA temperature thresholds for lifestages of salmon and for summer rearing of steelhead, both under baseline conditions and under each project alternative, in the Lower San Joaquin River and in each of its major tributaries.[94] The modeling exercise makes no effort to identify those locations at which temperature thresholds are achievable at what times under a suite of flow, diversion allocation and carryover storage scenarios. Exceedances of thermal thresholds are abundant in months from April through November in the baseline condition, and for the most part would continue under the modeled flow alternatives.

The analysis of thermal conditions in Chapter 7 of the SED is completely perfunctory because it provides the Board no insight as to how and where to set temperature objectives, under what conditions, and in what years. The SED complacently catalogues temperature exceedances under the apparent theory that if they don't get worse, the Board can meet its CEQA requirements. As described above, the modeling in the SED goes so far as to use perfect foresight to show that some exceedances could be zeroed out by "flow shifting." Generally, the modeling shows that, as flows increase, temperature decreases, at least during those periods of augmented flow.

The lower San Joaquin, Stanislaus, Tuolumne and Merced rivers are listed as impaired waterbodies due to elevated temperatures. The Board has an obligation to set objectives to address this impairment. However, the SED proposes no objectives to protect the identified beneficial uses of cold fresh water habitat; migration of aquatic organisms; spawning, reproduction and/or early development of fish; and rare, threatened or endangered species' habitats from elevated temperatures. This fails to comply with the requirements of the federal CWA.

B. The SED's Antidegradation Analysis Is Incomplete and Inadequate.

We are delighted to see that the 2016 SED now contains an antidegradation analysis. Unfortunately, the analysis is incomplete and inadequate, and fails to comply with state and federal antidegradation requirements and CEQA's requirements for fair disclosure and analysis.

Unlike state law, the federal Clean Water Act requires that water quality standards must fully protect – not reasonably protect - all identified beneficial uses. Designated beneficial uses in the Delta include, among others: Municipal and Domestic Supply; Industrial Service Supply;

[93] CWA Section 303(d); SED, Chapter 5, Table 5-4.
[94] See SED Chapter 7, Tables 7-20 a-d through 7-24 a-d and accompanying narrative, pp. 7-102 through 7-125.

Industrial Process Supply; Agricultural Supply; Ground Water Recharge; Commercial and Sport Fishing; Water Freshwater Habitat; Migration of Aquatic Organisms; Spawning, Reproduction and/or Early Development; Estuarine Habitat and Wildlife Habitat.

The SED proposes to increase the existing 0.7 dS/m April-August salinity limit in the South Delta by approximately 43% to 0.1 dS/m. The southern Delta is identified as impaired because of electrical conductivity (salinity) on the current CWA Section 303(d) list, and the existing salinity standard is routinely violated. Increasing the water quality standard would eliminate most of these ongoing violations and establish 0.1 dS/m EC as protective of beneficial uses.

As discussed at considerable length above, the SED fails to analyze the effects of increased salinity on fish, freshwater invertebrates, aquatic and riparian vegetation, which are identified beneficial uses. Indeed, as the USEPA acknowledged in its promulgation of federal water quality standards for the Delta at 40 CFR 131.37, the existing salinity standard is not protective of striped bass and splittail spawning. Moreover, the SED's analysis of salinity on south Delta agriculture is flawed because its recommendations rely on a report whose data is unsuitable for analysis of south Delta agriculture and whose calculated leaching fractions are seriously incorrect.

A more complete antidegradation analysis would show that the proposed weakening of southern Delta salinity standards would not comply with the antidegradation requirements of the federal CWA.

IV. Conclusion

The SED fails to comply with the requirements of CEQA.

The SED fails to consider the whole of the action in the Sacramento-San Joaquin Bay-Delta. The SED fails to establish an accurate and complete baseline for the project. The SED does not define its proposed project. The SED does not analyze a reasonable range of alternatives: its alternatives are incomplete; they are unclear; they exclude the San Joaquin River upstream of Merced confluence; they are simplistic and do not support efficient allocation of water; and they choose flow objectives that will not protect fish and wildlife. The SED fails to adequately provide the methodology and the analysis to support the Board's affirmative duty to protect the public trust. The SED and Appendix K improperly rely on adaptive management. The analysis of the proposed relaxation of south Delta salinity standards violates CEQA's requirement for analysis and fair disclosure. The SED understates potential economic impacts of Lower San Joaquin River flow objectives to hydropower, and does not adequately analyze possible mitigation.

The SED does not comply with the requirements of the federal Clean Water Act.

Appendix K of the SED proposes water quality objectives that will not fully protect beneficial uses. And the SED's antidegradation analysis is incomplete and inadequate.

For these reasons, the SED is deficient. The Board must correct these deficiencies in a new environmental document.

Thank you for the opportunity to comment on the *Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta: San Joaquin River Flows and Southern Delta Water Quality*.

Respectfully submitted,

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Water Rights Advocate
California Sportfishing Protection Alliance

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/s/ Michael Jackson

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Counsel to:
California Sportfishing Protection Alliance
California Water Impact Network
AquAlliance

Attachment 1 to Comments of
CSPA et al on SED
For San Joaquin Flows and Southern Delta Salinity

Water Temperature Targets
San Joaquin River

Report
Prepared by

Tom Cannon

for the

California Sportfishing Protection Alliance

March 17, 2017

San Joaquin River Water Temperature Recommendations

Introduction

In March, 2013, the California Sportfishing Protection Alliance (CSPA) proposed flow standards to protect Chinook salmon, steelhead, and other fish populations in the San Joaquin River and its major tributaries. CSPA recommendations came as part of its comments on the State Water Resources Control Board's (Board's) Substitute Environmental Document (SED) for the *Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and Implementation,* released on December 31, 2012. The Board revised and recirculated that document in September 2016. This report supplements our previous positions and recommendations presented in our March 2013 submittals, and CSPA's general comments on the September 2016 version of the SED.

In this report we make recommendations for water temperature objectives that are meant to supplement (not supplant) our flow recommendations. Water temperature objectives are absent from the current SED (Appendix K). This report is intended to provide background that will support the Board in establishing the water temperature objectives as part of its standard-setting responsibility.

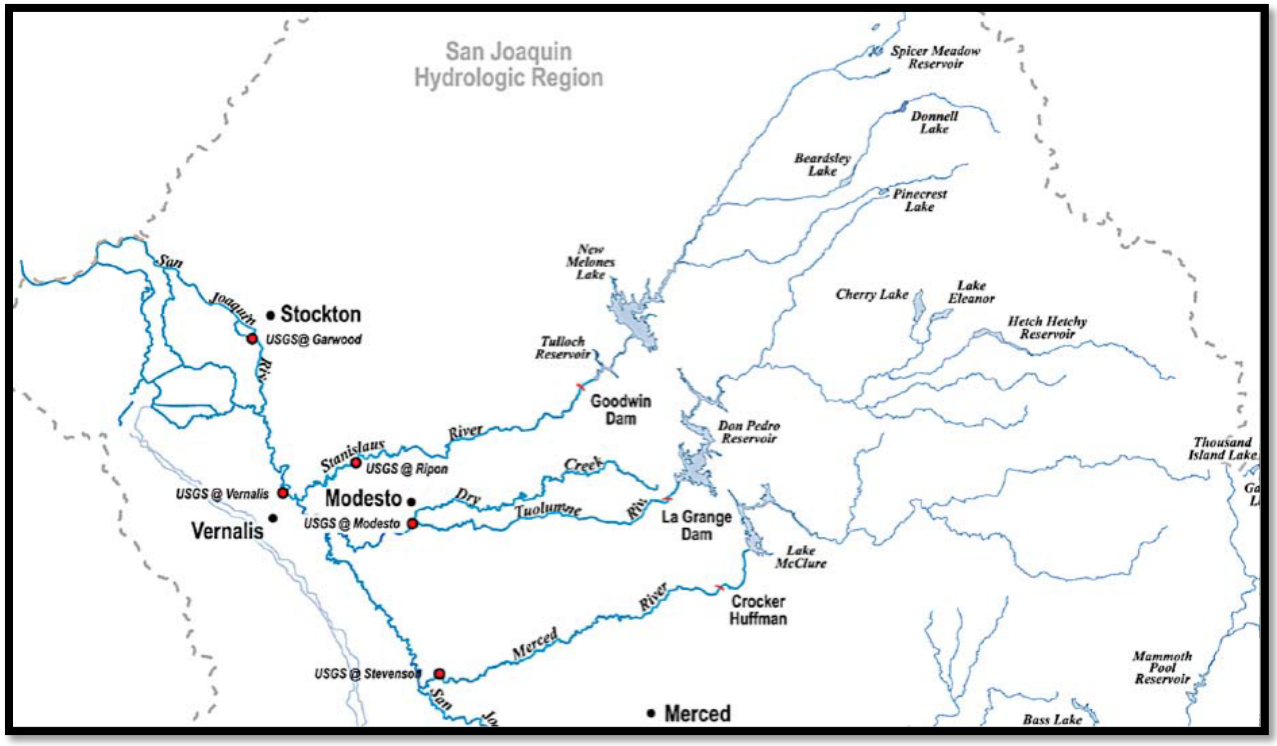

Figure 1. Lower San Joaquin River and its three main tributaries below Merced, California. (Source: Appendix C, SWRCB 2012)

Background

Large main-stem water supply reservoirs on the Stanislaus, Tuolumne, and Merced and associated water supply developments have markedly altered the rivers flow regimes to the point that existing salmon and steelhead populations in these rivers are now threatened with extinction.[1] While the annual salmon runs vary widely, there has been a continuing long-term downward trend in escapement in each of these rivers (see Figure 2 below). Salmonid populations in these tributaries need flows of higher magnitude, cooler water temperatures and seasonal variability to recover. We agree with the Board that higher flows will improve connectivity with the Delta and will provide better rearing and migration habitat in the three tributaries, the lower mainstem San Joaquin River, and the Delta. Further, we believe an increase in the amount of water from the San Joaquin watershed that reaches San Francisco Bay will increase the production of anadromous adult salmonids from the entire Central Valley, not just the San Joaquin River. Higher inflow from the San Joaquin River will also significantly benefit those resources that depend on the Delta, including all native fishes of the Sacramento River watershed that use the Bay-Delta.

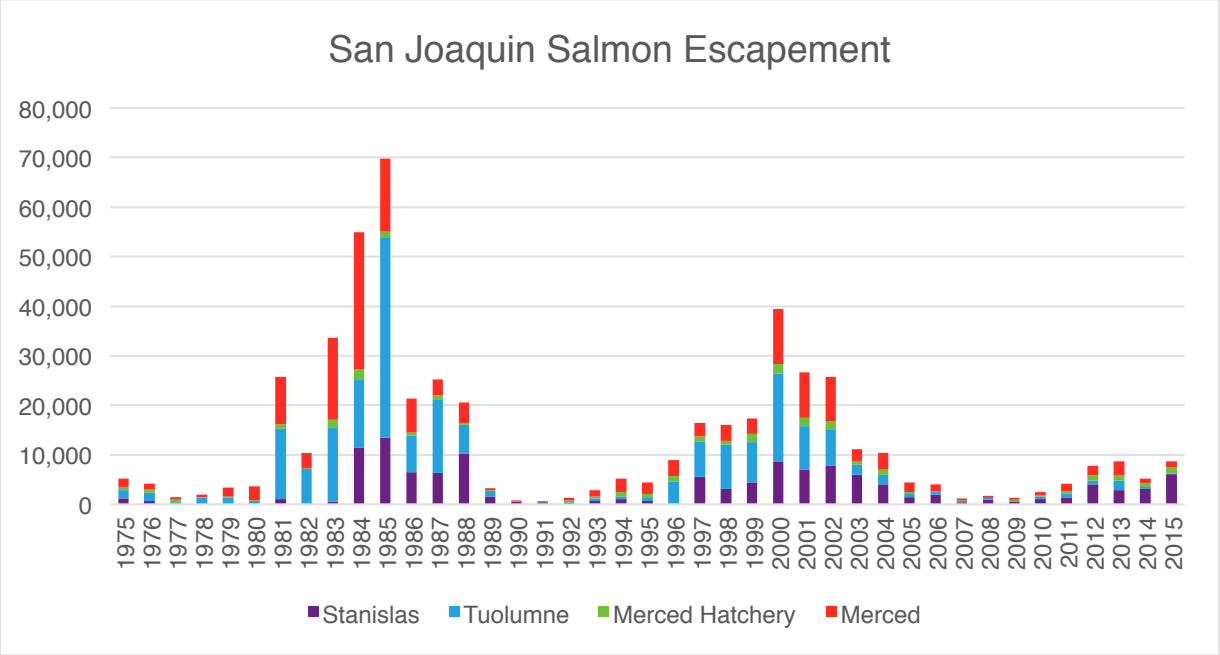

Figure 2. Escapement of fall-run Chinook salmon to the San Joaquin River as comprised by individual tributary and hatchery counts. (Source of data: CDFW GrandTab)

[1] *Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project (CVP) and State Water Project* (SWP). National Marine Fisheries Service, 2009. http://swr.nmfs.noaa.gov/ocap.htm. Also, Carl Mesick, Mesick, C. 2010. *The High Risk of Extinction for the Natural Fall-Run Chinook Salmon Population in the Lower Merced River due to Insufficient Instream Flow Releases*, November 30, 2010, and *The High Risk of Extinction for the Natural Fall-Run Chinook Salmon Population in the Lower Tuolumne River due to Insufficient Instream Flow Releases*, September 4, 2009. Both of these latter documents were submitted to the SWRCB on December 6, 2010 as supporting documents to comments by CSPA, C-WIN and AquAlliance on the *Draft Technical report on the Scientific Basis for Alternative San Joaquin River Flow and South Delta Salinity Objectives*.

A close look at recruitment per spawner in the San Joaquin salmon population over the past 40 years (Figure 3) provides clear evidence that recruitment suffers in years with dry winter-springs or dry falls. That relationship overwhelms the background relationship between spawners and recruits three years later.

1. Recruitment is significantly depressed in drier years compared to wetter years. The major contributing factor is likely poor survival in winter-spring of juveniles in their first year.

2. Recruitment is severely depressed for year classes rearing in critical years and returning as adults two years later in critical years (e.g., 88, 89).

3. Recruitment can be depressed for year classes with good winter-spring juvenile rearing conditions but poor conditions when adults return (e.g., 05, 06).

4. Recruitment can be enhanced for year classes with poor winter-spring young rearing conditions but very good fall conditions for adults returning (e.g., 81).

5. Recruitment was enhanced in recent years despite droughts likely as a consequence of pulsed spring and fall flow requirements in biological opinions since 2009 (e.g., rearing years 09-13 in Figure 3).

6. There is an underlying positive spawner/recruit relationship (a positive relationship between the number of spawners and the number of recruits returning three years later), but it is overwhelmed by the effect on recruitment of flow-related habitat conditions.

7. Poor ocean conditions in 2005-2006 likely contributed to poor recruitment.

The same basic pattern holds in the spawner-recruit relationship for the Tuolumne River, a subset of the overall San Joaquin relationship (Figure 4). A possible exception to the overall pattern is the lower recruits for rearing years 2012 and 2013, which indicates less response to recent higher San Joaquin watershed recruitment trends in the Tuolumne River (Figure 2). The reason for this is likely due to the lack of a fall flow pulse in the Tuolumne River in 2014 and 2015, since the existing FERC license for the Don Pedro Project requires no winter pulse in the Tuolumne River in Critically Dry water years and there is no over-riding provision for a fall pulse in the Tuolumne in the NMFS OCAP biological opinion as there is for the Stanislaus River (Figure 5).

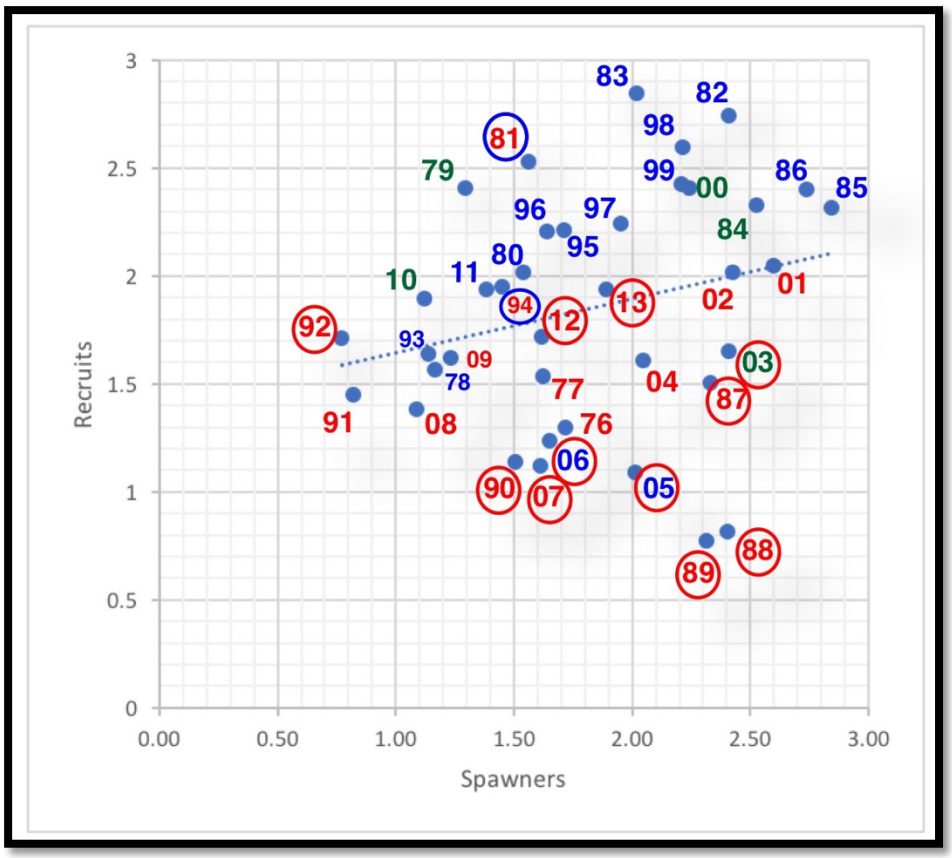

Figure 3. Recruits per spawners relationship ((log10X)-2) for San Joaquin River fall run Chinook salmon 1976-2015. The year shown is the year that the salmon were rearing as juveniles in the rivers in their first year of life. (For example: year 13 represents the progeny of the fall 2012 spawn; these juveniles in 2013 would have spawned as 3-year-old adults in 2015). Red years are critical and dry water years. Blue years are wet water years. Green years are normal water years. Red circles represent years when fall conditions during adult spawning would have reduced recruitment (for example: year 13 red circle indicates poor fall conditions during the fall of 2015). Blue circles represent years when fall conditions were good when recruits returned. (For example: year 81 has blue circle because 1983 fall conditions were good/wet year). Note that year 14 is as yet unavailable for inclusion in the dataset because run counts for fall 2016 are not yet available.

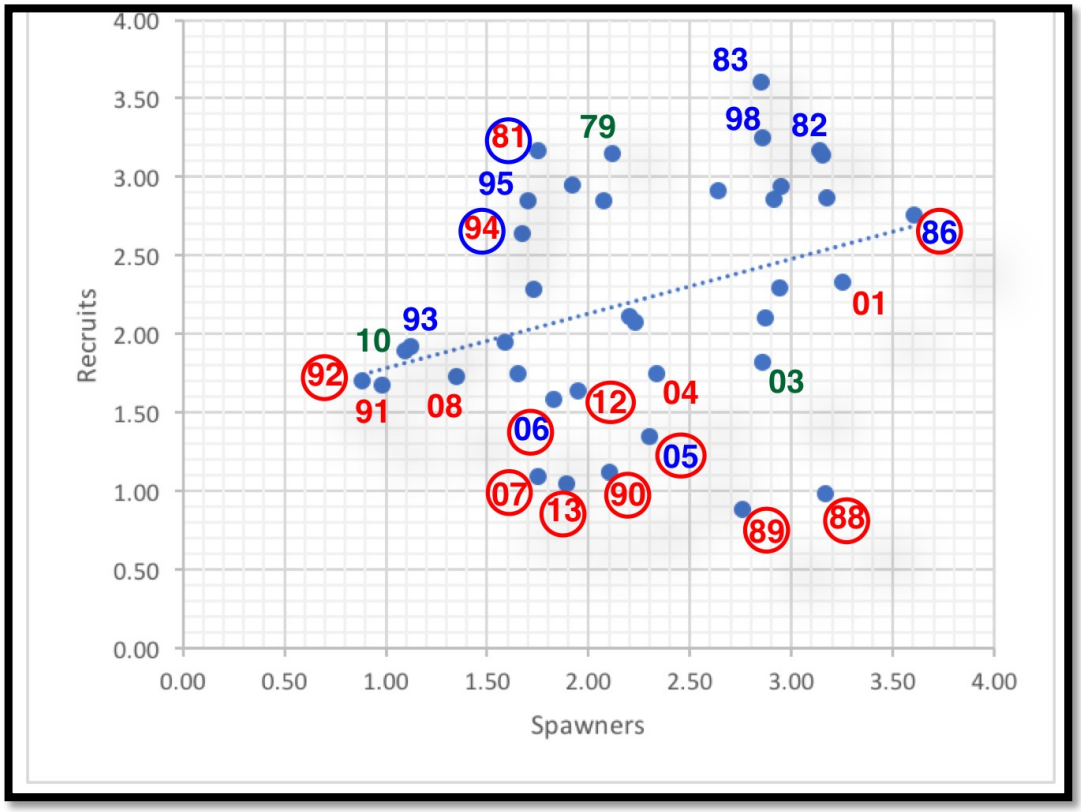

Figure 4. Recruits per spawners relationship ((log10X)-2) for Tuolumne River fall run Chinook salmon 1976-2015. The year shown is the year that the salmon were rearing as juveniles in the rivers in their first year of life. (For example: year 13 represents the progeny of the fall 2012 spawn; these juveniles in 2013 would have spawned as 3-year-old adults in 2015). Red years are critical and dry water years. Blue years are wet water years. Green years are normal water years. Red circles represent years when fall conditions during adult spawning would have reduced recruitment (for example: year 13 red circle indicates poor fall conditions during the fall of 2015). Blue circles represent years when fall conditions were good when recruits returned. (For example: year 81 has blue circle because 1983 fall conditions were good/wet year). Note that year 14 is as yet unavailable for inclusion in the dataset because run counts for fall 2016 are not yet available.

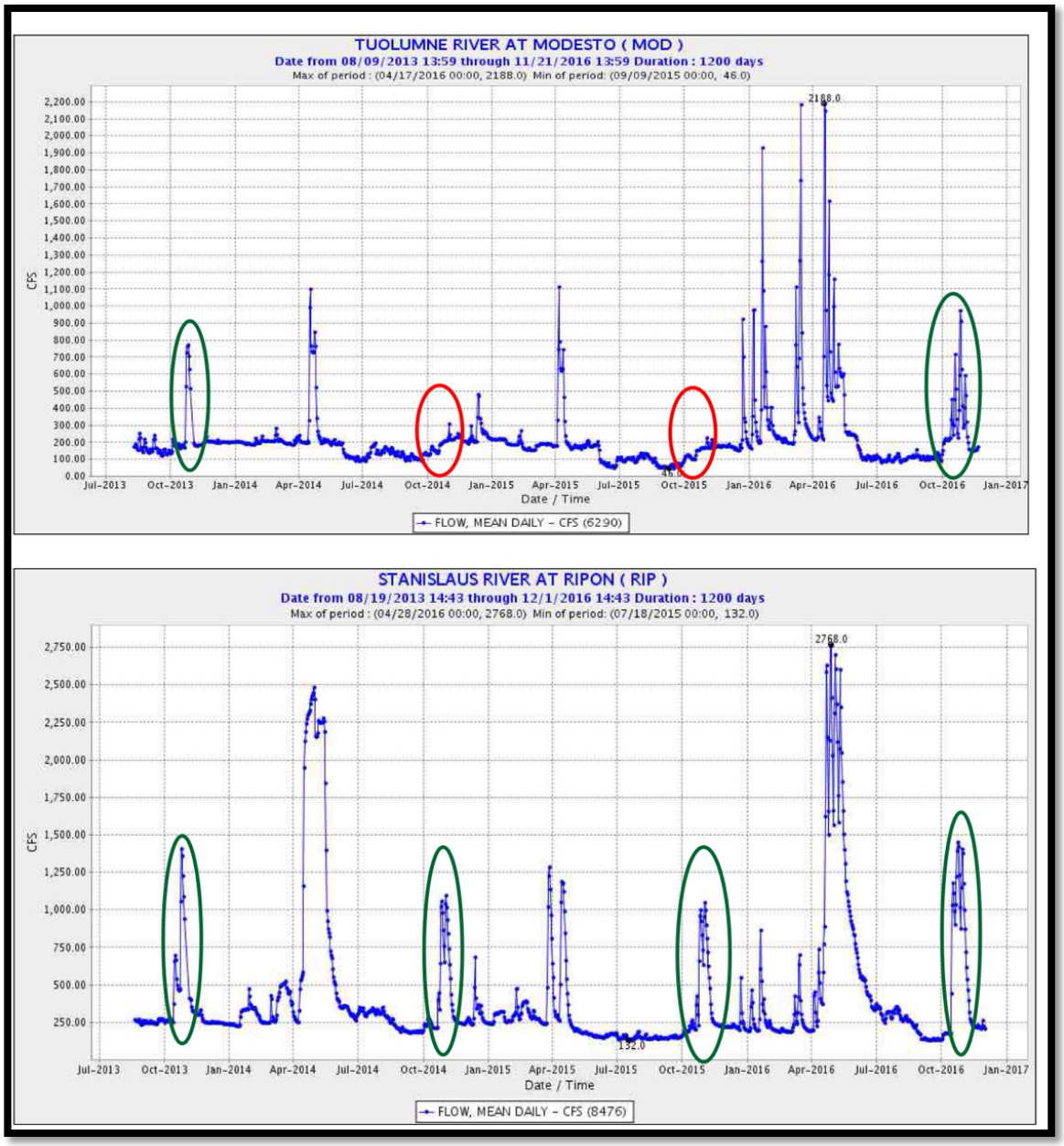

Figure 5. River flow in the Tuolumne and Stanislaus Rivers from fall 2013 to fall 2016. Red circles denote lack of prescribed fall flow pulse. Green circles denote fall flow pulses.

Recommended Water Temperature Targets for the Lower San Joaquin River and Tributaries

The following are appropriate targets for water quality for native fish habitat in the lower San Joaquin River and its three major tributaries: Stanislaus, Tuolumne, and Merced Rivers. The targets are based on well-established science on salmon ecology used throughout western North America including California. These targets are not intended to represent optimal temperatures for all times of year, or to suggest that, for instance, a water temperature in mid-January of 65° is a desired condition. Rather they are intended to represent targets above which the average daily temperature should not rise.

Fall Targets (October 1 or October 8, based on water-year type, to mid-December):

1. Target: 65°F/68°F[(a)] daily-average water temperature in the lower San Joaquin at Vernalis gage. Protects adult salmon migrants from being blocked, hindered, or stressed during their migration through the lower San Joaquin River to tributary spawning streams.

2. Target: 60°F/65°F[(a)] daily-average water temperature at lower gaging stations in three tributaries. Optimal spawning temperatures are below 60°F. Pre-spawn adult salmon water temperatures above 65°F are highly stressful leading to increases in pre-spawn mortality, loss of energy, and lower egg viability.

Rationale: to improve water temperatures, and dissolved oxygen levels. Central Valley fall run salmon begin their migrations from the ocean in summer, early migrants are hindered from moving up the rivers by high water temperatures in the lower Sacramento and San Joaquin rivers often until the fall. The high water temperatures are caused by a combination of warm air temperatures and low flow releases from Valley reservoirs to their tailwaters. In extended droughts high water temperatures can be associated with the loss of coldwater pools in reservoirs from low storage levels.

Winter-Spring Targets (mid-December through mid-June):

1. Target: 65°F/68°F[(a)] daily-average water temperature in the lower San Joaquin at Vernalis gage. Water temperatures below 65°F are optimal for growth and survival of emigrating and rearing juvenile Chinook salmon and steelhead. Water temperatures above 68°F are very stressful, severely reducing growth and survival and increasing susceptibility to predation.

2. Target: 60°F/65°F[(a)] daily-average water temperature at lower gaging stations in three tributaries. Water temperatures below 60°F are optimal for survival of salmon and steelhead embryos in gravel spawning beds. Above 60°F embryos and emerging fry would be stressed resulting in lower growth and survival. (Above 60°F predation rates on juvenile salmon rearing and emigrating in the Tuolumne River increased from 3-16%

below 60°F to 31-71% above 60°F[2], which is consistent with the general literature.) A target of 65°F on the lower river gage would allow a 60°F target to be met at middle and upper river gages.

Summer Targets (June through mid-September):

1. Target: 65°F/68°F[(a)] daily-average water temperature at locations specified by water-year type on each of the three tributaries. Optimal growth and survival occurs for over-summering juvenile salmon and steelhead below 65°F. Stress induced lower growth, survival, and increased susceptibly to predation occurs above 68°F.

Footnote(a) on management of flow and water temperature:

In limited water supply years, water temperature and flow criteria could be adjusted by date and location (e.g., Ripon to Oakdale on Stanislaus, Modesto to Waterford on Tuolumne, Stevinson to Snelling on Merced), or specific criteria (e.g., 60° to 65°F, or 65° to 68°F). Carryover storage must be adequate to sustain the upper-most criteria especially during the summer and early fall.

[2] http://www.donpedro-relicensing.com/Documents/P-2299_DP_ISR_W-AR-07_PredationStdyRept_130117.pdf, p. 5-15.