

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
1164	1	<p>The Unimpaired Flow Approach is Not Supported by the Best Available Science.</p> <p>The Revised Draft SED’s approach of focusing on increasing flows and essentially ignoring potential non-flow measures does not meet the basic requirement that an update to the Bay-Delta WQCP be based on sound science. Health & Safety Code § 57004; Water Code § 85280(b)(4) (Delta Science Program directed to provide “the best possible unbiased scientific information to inform water and environmental decision-making in the Delta”); see State Water Board Strategic Plan 2008-2012, at 7 (“We strive to earn the trust and respect of those we serve through commitment to truth, transparency, accountability, sound science in decision-making, fairness, and environmental justice.”).</p> <p>The Revised Draft SED forthrightly admits, as the Draft SED did before, that the underlying “fundamental project purpose and goal” is:</p> <p>To establish flow objectives during the February-June period and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the LSJR watershed, including the three eastside, salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers).</p> <p>ES-7-8. As to non-flow actions, the Revised Draft SED would provide that the SWRCB would just “recommend” certain actions in the implementation plan part of the Water Quality Control Plan. Revised Draft SED, ES-19. The Revised Draft SED asserts that implementation of such actions could “reduce the flows needed, within the adaptive range, to achieve reasonable fish and wildlife protection goals.” Id., Appendix. K, p. 37. Modification would be permissible, for example, “where scientific information indicates a flow pattern different from that which would occur by tracking the unimpaired flow percentage would better protect fish and wildlife beneficial uses,” provided that the total volume of water would be at least equal to the releases under an unimpaired flow regime. Id. The Revised Draft SED thus would provide no flexibility for flows outside of the 30-50% of unimpaired flow range, regardless of fisheries outcomes. This structure would amount to an improper predetermination by the SWRCB that increased flows are the answer to all fisheries challenges. Moreover, because the Revised Draft SED ignores – without mention – the available peer-reviewed scientific literature and the information that was presented to the SWRCB during the 2012 workshops, such a predecisional determination would not be based on substantial evidence.</p> <p>As recently as December 2016, a peer-reviewed study on the utility of pulse flows in salmonid recovery on the Stanislaus River concluded that flows alone only go so far to benefit fisheries. Although managed pulse flows resulted in immediate increases in daily passage, that response was brief and not sustained over the long term. Matthew L Peterson, Environmental Factors Associated with the Upstream Migration of Fall-Run Chinook Salmon in a Regulated River, 37 American Journal of Fisheries Management 78–93, 89 (2016). Those data indicated, as other studies had in the past, that pulse flows may be a useful tool for restoring and maintaining habitat, but are certainly not the defining factor in preserving fish populations. Moreover, that study indicated that, at least as to the Stanislaus River, there were certain thresholds in timing and magnitude of discharges beyond which pulse flows provided no additional benefit. Id. at 91.</p> <p>The 2016 Stanislaus River study’s results are consistent with the observations and data provided by NCWA [Northern California Water Association] and others to the SWRCB at its workshops in 2012, and with the scientific community’s evolving thinking regarding the</p>	<p>The SED is based on sound science and provides for flexibility both to maximize benefits to fish and wildlife and in response to changing conditions. Please see the Executive Summary, Appendix K, Revised Water Quality Control Plan, and Master Response 2.2, Adaptive Implementation, for a discussion of the adaptive implementation elements and framework in the program of implementation. Please see Master Response 2.2, Adaptive Implementation, regarding how adaptive implementation can be implemented. Please also see Master Response 3.1, Fish Protection, for a discussion of the current fish decline and the need for increased and more variable flows as well as how the unimpaired flow approach with adaptive implementation is a functional flow approach.</p> <p>See Master Response 5.2, Incorporation of Non-Flow Measures, regarding non-flow measures, their role in the overall health of the tributaries’ ecosystem, and how they can be incorporated in response to the implementation of the plan amendments. Also refer to Chapter 3, Alternatives Description, Appendix K, Revised Water Quality Control Plan, and Master Response 2.1, Amendments to the Water Quality Control Plan, for additional discussion of the State Water Board’s authorities and integration of non-flow measures into the plan amendments.</p> <p>The pulse flow study on the Stanislaus River (Peterson et. al 2017), was conducted to evaluate the effects of flow on the migration of adult fall-run Chinook salmon during the fall time period which is outside of the February through June period addressed by the plan amendments, which seek to improve conditions during the critical spring time period for rearing and migrating juvenile salmon and steelhead, and other native fish. Furthermore, the study found evidence that both temperature and dissolved oxygen conditions affected the overall run timing of adult Chinook salmon at the Stanislaus River weir, but the study fails to acknowledge that flow conditions affect temperature and dissolved oxygen. Additionally, understanding how environmental conditions during adult migration and pre-spawn holding effect egg viability is something that the study fails to consider but is extremely important to overall success of reproduction. Finally, the study authors (Matthew L. Peterson, Andrea N. Fuller & Doug Demko) recommend (page 91 of their publication) that if pulse flows are continued, that they: (1) be conducted in a more experimental fashion; and (2) they mimic the natural hydrograph for the time of year. Both recommendations are supportive of the proposed plan amendments described in SED. The SED seeks to more closely mimic the natural hydrograph during February through June, and seeks to allow flexibility through adaptive implementation for experimentation. See Appendix K, Revised Water Quality Control Plan, and Master Response 2.1, Amendments to the Water Quality Control Plan, and Master Response 3.1, Fish Protection, regarding the State Water Boards authority, modifications to the plan amendments, and expected benefits from implementation of the plan amendments.</p> <p>The State Water Board considers all information presented and conducted significant public outreach. In response to oral and written comments received concerning the 2012 Draft SED, the State Water Board revised the SED and recirculated the entire document. Please see Master Response 1.1 for additional discussion regarding the public review and recirculation process and the public outreach process.</p> <p>In addition, much of the information that the commenter attached to their comments is not related to the plan amendments and SED for the Lower San Joaquin River and its three major tributaries, the Stanislaus, Tuolumne, and Merced Rivers. Instead, those comments are specific to the Sacramento Valley watershed, the Delta, and the Delta’s primary eastside tributaries, the Cosumnes, Mokelumne, and Calaveras Rivers. Because issues related to Sacramento River flows, interior Delta flows, etc., are unique they are being addressed in the Water Quality Control Plan update for the Sacramento Valley watershed, the Delta, and the Delta’s primary eastside tributaries. Please refer to Master Response 1.2, Water Quality Control Planning Process, for more information regarding how proceedings on the Lower San Joaquin River and its three eastside tributaries are independent actions.</p>

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		<p>benefit of unimpaired flows to Delta fish populations. As NCWA has already observed in its comments on the draft Scientific Basis Report for Phase 2 of the WQCP update, which are attached hereto and incorporated herein as Exhibit A [see ATT1], the approach reflected in the Revised Draft SED relies on outdated material, is often contradictory or ill-supported, and is grossly lacking in empirical support. It is especially troubling to NCWA that these concerns and data have been repeatedly presented to the SWRCB since 2012, and yet the Revised Draft SED still fails to remedy these errors. Here, the issue “goes beyond a disagreement of qualified experts over the reasoned conclusions as to what the data reveals.” Berkeley Keep Jets Over the Bay v. Board of Port Comm’rs of the City of Oakland, 91 Cal. App. 4th 1344, 1355 (2001). The Revised Draft SED fails to acknowledge “the opinions of responsible agencies and experts who cast doubt on its analysis, and it fails to appropriately support its conclusions with scientific or objective data. “These violations of CEQA constitute an abuse of discretion.” Id. See also California Hotel and Motel Ass’n v. Industrial Welfare Comm., 25 Cal. 3d 200, 213 n.30 (1979) (“good judges customarily tread lightly when they are impressed with the care, conscientiousness, and balance of the administrators, but they penetrate more deeply . . . when the administrative performance seems to them to have been slovenly.”)</p> <p>Revisions to the Bay-Delta WQCP that rely on outdated data, disregard the best available scientific evidence, and fail to meaningfully engage with comments during the environmental review process are wholly inconsistent with the SWRCB’s mandate and its own mission statement. An SED, if adopted, must be supported by substantial evidence. See Water Code §13330 (challenge to SWRCB decision by means of writ of mandate); Gov’t Code §1094.5 (administrative mandamus challenges based on whether there is substantial evidence to support the agency’s decision); Western States Petroleum Ass’n v. Superior Court, 9 Cal.4th 559, 573 (1995) (substantial evidence review for quasi-legislative administrative decisions); State Water Resources Control Board Cases, 136 Cal.App.4th 674, 763 (2006) (To be substantial, evidence “must be reasonable in nature, credible, and of solid value; it must actually be “substantial” proof of the essentials which the law requires in a particular case.’ ”). The current Revised Draft SED fails to meet this standard.</p>	
1164	2	<p>By Proposing to Amend the Wrong Water Quality Control Plan, the SWRCB Fails to Undertake the Statutorily Mandated Balancing of the Public Interest on the Affected Streams.</p> <p>The Revised Draft SED proposes to update the Water-Quality Control Plan for the Bay-Delta. This WQCP applies to, and is intended to protect the waters of, the legal Delta. See Water Quality Control Plan for the San Francisco Bay/San Joaquin Delta Estuary (May 1995) (“1995 Bay-Delta WQCP”), at pp. 1-7; Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 13, 2006) (“2006 Bay-Delta WQCP”), at pp. 1-3. The existing Bay-Delta WQCP designates water quality objectives to be met at Vernalis, which is within the legal Delta. 2006 Bay-Delta WQCP, pp. 28-30, 53.</p> <p>The waters of the Merced, Tuolumne, and Stanislaus Rivers are not within the legal Delta. Water Code § 12220. The water quality objectives for these rivers are included in the Central Valley Basin Plan. As required by law, these water quality objectives were developed and adopted after a balancing of the competing uses of water. See Water Code § 13241 (requiring the boards to consider the water quality objective’s impact on factors such as past, present and future beneficial uses of the water; economic considerations; and</p>	<p>Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding the geographic scope of the plan area. The State Water Board is including the LSJR and its three eastside tributaries pursuant to authorities granted by the Porter-Cologne Act and the California Water Code (Wat. Code §§ 13170, 13240-13244).</p> <p>Please also see Master Response 1.2, Water Quality Control Planning Process, regarding State Water Board authorities related to the water quality control planning process, and the Boards’ consideration of beneficial uses.</p>

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		<p>housing).</p> <p>The Revised Draft SED proposes to amend the Bay-Delta WQCP to add new water quality objectives for the tributaries to the San Joaquin River, which are not within the legal Delta and are not within the waters protected by the Bay-Delta WQCP. When the State Water Board considers amending the Bay-Delta WQCP, it must consider how the proposed new objectives would affect the past, present and future beneficial uses of water in the Bay-Delta, the economy of the Bay-Delta, and the housing of the Bay-Delta. However, here all of the impacts of the new objectives would occur in the upstream areas outside of the legal Delta. If the State Board adopts these water quality objectives, it would effectively be superseding the existing water quality objectives the Central Valley Regional Board set for those streams, without undertaking the statutorily mandated analysis of the competing uses for this water. See Water Code §§ 13170, 13240-13244. This effectively would obviate the statute's required public-interest balancing.</p>	
1164	3	<p>Complex Delta Systems Require a Coordinated Approach to Management.</p> <p>NCWA [Northern California Water Association] and other commenters have repeatedly raised concerns about the flow-centric approach taken in prior drafts of the SED. The Revised Draft SED responds by stating that water quality control and water right actions that address flow are “squarely within the SWRCB’s purview.” Revised Draft SED, ES-73. This response is incorrect on two grounds. First, the Revised Draft SED would inappropriately usurp the Central Valley Regional Board’s authority to set the water quality objectives for these tributary streams without appropriately analyzing whether other beneficial uses are unreasonably impacted. See Water Code §§ 13170, 13241. Second, the Revised Draft SED misstates NCWA’s concern, which is that the use of unimpaired flow as the primary mechanism for achieving salmon recovery objectives would impose substantial impacts on water users without any marked benefit to fisheries and, as a result, fails to balance competing beneficial uses of water as required by the Porter-Cologne Water Quality Control Act.</p> <p>It has long been apparent that both salmonid populations and consumptive uses would be ill-served by a management program that would focus unduly on increased flows and not include appropriate non-flow measures. Indeed, NCWA and others presented substantial information during the SWRCB’s fall 2012 workshops on Phase 2 of the Comprehensive Review of the Bay-Delta WQCP, which demonstrated that preserving and restoring fishery resources requires both flow and non-flow measures (e.g., habitat restoration measures). [Footnote 1: The evidence submitted by NCWA in those workshops is attached hereto as Exhibit B [see ATT2], and incorporated by reference herein.] That testimony established that simple reliance on perceived statistical correlations between flows and fish populations grossly oversimplified the management challenges of the Delta. See, e.g., ICF, DRAFT Bay-Delta Plan Workshops Summary Report, pp. 6, 9, 20 (Dr. Wim Kimmerer), 24 (Dr. Cliff Dahm) (Jan. 2013.) Indeed, the Revised Draft SED explicitly recognizes that non-flow measures, such as habitat restoration, “must also be part of efforts to comprehensively address Delta aquatic ecosystem needs as a whole.” Revised Draft SED, Appendix. K, p. 27. Water Code section 13241(c) requires the Board, in weighing a proposed water quality objective such as those at issue here, to consider the “water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.” In the context of fishery flows, “all factors” necessarily encompasses non-flow measures such as riparian vegetation that helps maintain cooler temperatures and provides</p>	<p>Please see response to comment 1164-1 regarding the scientific basis for the plan amendments.</p> <p>Please also see Master Response 1.2, Water Quality Control Planning Process for a discussion of the consideration of beneficial uses by the State Water Board, including factors under Water Code section 13241. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding the plan area, extended plan area, and the State Water Board’s authority to define the geographic scope of the Bay-Delta Plan. Please see Master Response 3.1, Fish Protection, regarding the need for increased and more variable flows to reasonably protect fish and wildlife.</p> <p>Please see Master Response 5.2, Incorporation of Non-Flow Measures regarding non-flow measures, their role in the overall health of the tributaries’ ecosystem, and how in most cases non-flow measures depend on sufficient flow for successful implementation and therefore cannot be substituted or prioritized over the need for flow requirements. The State Water Board makes recommendations for nonflow measures, including to other state agencies, as part of the program of implementation. However, as identified in Master Response 3.1, it is reductions in flow and alterations to the flow regime in the San Joaquin River basin resulting from water development over the past several decades that have negatively affected fish and wildlife beneficial uses. The State of California does not have any water development facilities on the Stanislaus, Tuolumne, and Merced Rivers. Please also see Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, for a discussion as to why mandatory imposition of non-flow measures is not a viable alternative to the plan amendments.</p>

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		<p>refugia for fish. Despite both its express acknowledgment of the importance of considering non-flow measures and the statutory mandate, the Revised SED offers only that the SWRCB will use its authority “as needed and appropriate” under Water Code section 13165 to require additional monitoring or to implement select non-flow measures. Revised Draft SED, Appendix. K, p. 55.</p> <p>This approach ignores-Water Code section 13247, which requires that “state offices, departments, and boards, in carrying out activities which may affect water quality, shall comply with water quality control plans approved or adopted by the state board unless otherwise directed or authorized by statute, in which case they shall indicate to the regional boards in writing their authority for not complying with such plans.” The Revised Draft SED should direct other state agencies to implement the Program of Implementation contained in Appendix K, unless otherwise directed or authorized by statute. See State Water Resources Control Board Cases, 136 Cal. App. 4th 674, 730, 732 (2006).</p>	
1164	4	<p>The Unimpaired Flow Approach Would Impose Significant Costs, Without Evidence of Significant Benefits.</p> <p>The Delta Reform Act sets out the co-equal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. Water Code § 85054. The Revised Draft SED describes a plan that would threaten the first of these goals, without empirical evidence to support achievement of the second. This unbalanced approach certainly would not be consistent with the Legislature’s mandate that water supply reliability and ecosystem restoration be treated as co-equal goals.</p> <p>Empirical data here indicates that an unimpaired flow regime would not be the panacea that the Revised Draft SED suggests it is. Since the adoption of Water Right Decision 1641 (revised), more than 1.3 million acre-feet annually of additional outflow has been dedicated to fisheries maintenance. [Footnote 2: Of this, approximately 300,000 acre-feet can be attributed to D-1641 outflow and compliance; and an additional 1 million acre-feet is attributable to compliance with the Salmon and Smelt Biological Opinions. See MBK Engineers and HDR “Retrospective Analysis of Changed Central Valley Project and State Water Project Conditions Due to Changes in Delta Regulations,” January 2013, attached hereto as Exhibit C [see ATT3].] If flow truly were the limiting factor in fisheries’ recovery, there would have been attendant increases in fish populations over that time period. Instead, there have been observable declines.</p> <p>Indeed, there is no empirical evidence to suggest that an unimpaired flow approach will significantly benefit fisheries, and substantial evidence to suggest that it will not. See Exhibit A [see ATT1] (NCWA Comments on Draft Scientific Basis Report). In May 2014, moreover, a panel of experts directed by the Delta Stewardship Council to consider the relationship of flow to other stressors observed that some of the potential flow options identified for the Bay-Delta “would come at very large costs to water users. These costs are also rarely quantified during outflow discussions.” Delta Stewardship Council, Workshop on Delta Outflows and Related Stressors Panel Summary Report, p. 39, attached hereto as Exhibit D [see ATT4]. The panel’s report went to opine:</p> <p>“It is highly uncertain whether the collaborative adaptive management approach proposed by the Delta Science Program can resolve the extreme trade-offs that exist in the Bay-Delta [Adaptive Management] setting. Implementation of new flow criteria is going to be very challenging...a systems context for considering outflow criteria should also evaluate non-</p>	<p>Please see Master Response 3.1, Fish Protection, and Chapter 19, Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30, and Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives, regarding the scientific basis for the plan amendments.</p> <p>Please see response to comment 1164-1 regarding the geographic scope of the plan amendments, and information that is outside of the scope of the plan amendments and the SED analyses. The commenter’s references are largely regarding the Sacramento Valley, outflow from the Sacramento River watershed, and in-Delta state and federal water project operations. None of commenter’s exhibits were generated with respect to the plan amendments and SED. Commenter’s Exhibits B, C, and D, are copies of presentations that were generated two to four years prior to the release of the plan amendments and SED and concern, for the most part, a different geographic area.</p> <p>Please refer to Chapter 19, for an advisory regarding the SalSim model and Master Response 3.1, Fish Protection, regarding the limitations of the SalSim model. While SalSim helped inform some of the concepts behind, for example, flow shifting as part of the program of implementation (See Master Response 2.2, Adaptive Implementation), the State Water Board did not rely upon SalSim for its analyses of fisheries benefits; therefore, it is inaccurate to state that the SED presents SalSim results as the level of expected benefit.</p> <p>Please refer to Master Response 5.2, Incorporation of Non-Flow Measures, regarding the flexibility in the plan amendments to combine increased flow with additional non-flow actions to comprehensively address ecosystem needs in the LSJR and its three eastside tributaries. Please also see Master Response 3.1 for a discussion of other stressors, including predation.</p> <p>Please also see Chapter 20, Economic Analyses, and Master Response 1.1, General Comments, regarding the duty of the State Water Board to consider economic effects.</p>

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		<p>flow alternatives, such as predator control; to date, such consideration of other options has been relatively limited.”</p> <p>Id. Given the lack of evidence that the unimpaired flow regime will truly benefit fish populations, the potential costs imposed upon consumptive uses are disproportionately high. Indeed, the Revised SED estimates that the fisheries benefits from the proposed water quality objections would be the return of only an additional 1,100 fish. See Revised Draft SED, Table 19-32. That benefit would come at a cost of 300,000 acre-feet/year, or sufficient water to irrigate 100,000 acres or provide water to approximately 1.5 million people.</p>	
1164	5	<p>In deciding whether to make changes to the Bay-Delta WQCP, the SWRCB must consider whether the proposed changes would be reasonable, “considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Water Code § 13000. Given the lack of empirical support for an unimpaired flow regime, and the clear evidence of the impacts such a regime would impose on other water users, NCWA [Northern California Water Association] believes that the amendments proposed here are neither reasonable, nor supported by substantial evidence.</p> <p>NCWA urges the SWRCB to revise and recirculate the Revised Draft SED, and to further revise the recirculated Revised Draft SED so that that will be consistent with the Porter-Cologne Water Quality Control Act, CEQA, the Delta Reform Act, and the best available science.</p>	<p>Please see Master Response 1.1, General Comments, for responses to comments regarding adequacy of analyses in the SED, substantial evidence, and the scientific basis of the SED and plan amendments. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for responses to comments regarding support for the plan amendments and providing reasonable protection of fish and wildlife while moderating impacts to water supply for drinking water and agriculture. Please see Master Response 1.2, Water Quality Control Planning Process, regarding the consideration of beneficial uses and the applicability of the Porter-Cologne Water Quality Control Act to the water quality control planning process.</p>
1164	6	<p>[ATT1: Exhibit A: Letter from Northern California Water Association. Comments Re: the Phase II Scientific Basis Report. December 16, 2016.]</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1164	7	<p>[From ATT1:]</p> <p>The unimpaired flow approach would not work for 21st century California.</p> <p>The “unimpaired flow” approach would not be practical as a regulatory approach nor would it help foster or serve as a good measure for the success of negotiated resolutions or voluntary agreements as called for in the California Water Action Plan. Water suppliers in every part of California expressed concerns with this approach last July 25 for this reason.</p> <p>The “unimpaired flow” approach is a variation of an old and tired dogma where redirecting water for instream flows was the objective, rather than focusing on how water can best serve multiple beneficial purposes such as fish, birds, cities and farms, as required by Water Code §13000 et seq. The “unimpaired flow” approach also belies 21st century water management that is necessary to serve 39 million people with a highly diverse landscape in California. This simplistic approach would provide little, if any, benefit for the environment in the Bay-Delta water system, and would adversely affect the environment in upstream areas such as the Sacramento Valley by depleting cold water reservoir supplies that are needed for salmon, by reducing available water supplies for birds and the Pacific Flyway, and by limiting food production throughout the Sacramento Valley that is necessary for healthy fish and birds.</p> <p>Importantly, redirecting wholesale blocks of water into the Delta without clear scientific benefits would undermine the state’s co-equal goals and would be a waste and</p>	<p>Please see response to comment 1164-1. The attachment is addressing a proceeding outside of the plan amendments. To the extent that the comment can be construed as a general comment regarding the unimpaired flow approach, please refer to Master Response 1.1 General Comments and Master Response 3.1 Fish Protection for information regarding the justification for using the unimpaired flow approach on the Stanislaus, Tuolumne, and Merced Rivers and support for the unimpaired flow approach based on peer-reviewed, scientific information. Please also refer to Master Response 1.1 General Comments for information regarding the State Water Board authority to prevent waste or unusable use of water.</p>

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		unreasonable use of water in California.	
1164	8	<p>[From ATT1:]</p> <p>An unimpaired flow objective would not be likely to benefit fish in the Delta.</p> <p>California has tried a highly flow-centric approach in the Delta for the past several decades, with agencies re-directing more than 1.3 million acre-feet more water per year for Delta outflow over the past several decades. (See MBK Engineers and HDR “Retrospective Analysis of Changed Central Valley Project and State Water Project Conditions Due to Changes in Delta Regulations,” January 2013.) This has not improved fisheries in the Delta and it appears that there have been further declines in pelagic fisheries with these additional flows. Now is the time to try a different approach.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED as well as the unimpaired flow approach in the plan amendments as a functional flow approach.</p> <p>For a hydrologic analysis of the San Joaquin River Basin, which is the focus of the proposed project, see Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives.</p>
1164	9	<p>[From ATT1:]</p> <p>Modern science has shown that dedicating large blocks of water to a sterile and inhospitable channelized river provides little or no benefit to fisheries in the Delta. For example, the Delta Independent Science Board in “Flows and Fishes in the Sacramento- San Joaquin Delta” (August 2015) presented a report that highlighted this dynamic. The Lead Scientists for the program have also presented this information to the State Water Board on several occasions over the past several years, explaining that adding water to a clear, inhospitable channel, such as those in the Delta, would not improve fisheries unless other issues are addressed.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED as well as the unimpaired flow approach in the plan amendments as a functional flow approach.</p> <p>Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>Please also refer to Master Response 3.1, Fish Protection, regarding the scientific basis of why more flow is needed in the Stanislaus, Tuolumne and Merced Rivers during February through June, and the benefits that additional flow provides. See Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, regarding the adequacy of the range of alternatives.</p>
1164	10	<p>[From ATT1:]</p> <p>The State Water Board held a series of workshops in 2012 to bring good modern science to the process. The October draft scientific basis report has completely ignored the entire 2012 process. In that process, ICF presented a formal report to the SWRCB that raised some serious questions about the “unimpaired flow” approach. The draft scientific basis report also has completely ignored peer-reviewed and published scientific reports that question the relationship between Delta flows and Delta fish abundance. Instead, the Draft SBR [Scientific Basis Report] relies on old, outdated reports.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED as well as the unimpaired flow approach in the plan amendments as a functional flow approach.</p> <p>Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p>
1164	11	<p>[From ATT1:]</p> <p>A snapshot of the current and evolving science surrounding the Delta can be seen in the recent Delta Science Program report “The Delta on Fast Forward: Thinking Beyond the Next Crisis” (November 2016), where there is a focus on various priority stressors that do not include unimpaired flows into the Delta.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED as well as the scientific basis for the plan amendments.</p> <p>To the extent that this comment is addressing non-flow measures generally, please see Master Response 5.2, Incorporation of Non-Flow Measures.</p>
1164	12	<p>[From ATT1:]</p> <p>For salmon, Dave Vogel, a leading expert on salmonid species who presented and submitted important biological information and analyses during the 2012 workshops, has undertaken a detailed review of the Draft SBR [Scientific Basis Report] sections pertaining to anadromous salmonids. His key conclusions and recommendations are summarized as follows:</p> <p>* The best available science concerning anadromous salmonids was not used in preparing</p>	<p>Please see response to comment 1164-1. These comments provided in this attachment were not submitted to the State Water Board on the plan amendments or SED and are not related to the WQCP update for San Joaquin River Flows and Southern Delta Water Quality.</p> <p>Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p>

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		<p>the Draft SBR--relevant science on anadromous salmonids, previously provided for the 2012 Workshops, was overlooked or ignored.</p> <p>* Information regarding Sacramento River basin anadromous salmonids presented in the Draft SBR is incomplete and largely out-of-date.</p> <p>* Many statements in the Draft SBR regarding anadromous salmonids are unsubstantiated with no supporting scientific basis.</p> <p>* The Draft SBR does not address major scientific uncertainties or highly complex variables affecting salmonids.</p> <p>* There are numerous conflicting and confusing statements concerning unimpaired flows and natural flows.</p> <p>* The draft SBR frequently recommends “mimicking the natural hydrograph” for purported benefits to anadromous salmonids, but then also recommends artificially “sculpting” flows that would not reflect natural hydrologic conditions.</p> <p>* The Draft SBR lacks descriptions of alleged flow-related problems in the Sacramento River and its tributaries on a specific spatial and temporal basis.</p> <p>* The Draft SBR is severely deficient in not providing any meaningful details on non- flow measures that could be implemented to benefit salmonids.</p> <p>* The Draft SBR does not adequately describe the specific biological mechanisms that would result from the flow recommendations, and does not quantify how those mechanisms would benefit anadromous salmonids.</p> <p>* The Draft SBR provides no meaningful discussion of the redirected impacts on other species and life stages that would result from the flow recommendations – e.g., major reductions in water storage in the large reservoirs (Shasta, Oroville, Folsom).</p> <p>* The Draft SBR is severely deficient in the section concerning other stressors on anadromous salmonids, and additional management actions which could be implemented to benefit salmonids.</p>	<p>To the extent the comments may be construed as a general comment on best available science, the State Water Board has strived to use the best available science throughout the scientific basis and benefits and impacts analyses, consistent with the requirements of the certified regulatory planning process, and, in accordance with CEQA, used its best efforts to find out and disclose what it reasonably can. Overwhelming scientific evidence indicates that more flow of a more natural flow regime is needed to improve the riverine ecosystems in the Stanislaus, Tuolumne, Merced, and San Joaquin Rivers. Please see Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives, Chapter 19, Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30, and Master Response 3.1, Fish Protection, regarding the scientific basis of the plan amendments.</p> <p>See Appendix K, Revised Water Quality Control Plan and Master Response 2.2 regarding adaptive implementation of the plan amendments. In particular, please see the description of adaptive implementation method (b), also referred to as “flow shaping.” Flow shaping allows entities responsible for complying with the flow requirement to manage the total volume of February through June unimpaired flows as a water budget that can be shaped to better maximize achievement of the LSJR flow objectives.</p> <p>See Chapter 7, Aquatic Biological Resources, regarding the impact evaluations of other species.</p>
1164	13	<p>[From ATT1:]</p> <p>For pelagic fish, Dr. Robert Latour, an expert on the use of biostatistics in fishery management and who also presented important information during the 2012 workshops, has reviewed the Draft SBR's [Scientific Basis Report] sections concerning pelagic fish in the Delta. His comments include the following:</p> <p>* The Draft SBR does not consider peer-reviewed, published scientific reports that demonstrate that statistical analyses based on Fall Midwater Trawl indices on which the Draft SBT is based are flawed. [Footnote 1: See Newman, K. 2008. Sample design-based methodology for estimating delta smelt abundance. San Francisco Estuary & Watershed Science 6(3); Latour, R.J. 2016. Explaining patterns of pelagic fish abundance in the Sacramento-San Joaquin Delta. Estuaries and Coasts 39:233-247.]</p> <p>* By relying strictly on survey indices, the Draft SBR disregards a very large amount of</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED.</p> <p>Please see Master Response 1.1, General Responses for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p>

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		<p>instructive information concerning the relationship between fish behavior and condition and environmental variables. The basis for a much more robust analysis would be readily available in existing data if the analysis instead were to be based on the raw survey data, rather than only on the indices, as is the currently dominant approach.</p> <p>* The Draft SBR does not account for known and significant scientific uncertainty with current fish abundance indices. Failing to account for that uncertainty significantly detracts from the value for policymaking of any analysis based on those indices.</p> <p>* As a result of these problems with the current method of analysis of the relationship between environmental variables and Delta fish populations, including the analysis reflected in the Draft SBR, the Draft SBR does not meet the scientific standards applied by, among other agencies in the United States, NOAA Fisheries in developing policy for other fish-management programs, such as setting acceptable levels of commercial fish harvest.</p>	
1164	14	<p>[From ATT1:]</p> <p>Although the “unimpaired flow” approach is suggested as a way to mimic natural flow patterns, this would not be the case in the Sacramento Valley. The term “natural” flows describe the flows that would have occurred absent all anthropogenic influences and is considered to represent flows during the period before significant landscape changes in the Delta and Sacramento River basin. Since then, there have been substantial changes in land use, including the clearance and drainage of wetlands and constructions of levees for flood control, which have ended the natural cycle of bank overflows and detention storage. These influences have dramatically affected Central Valley and Delta flows. For this reason, unimpaired flows do not represent natural conditions in the Sacramento Valley and Delta. Instead, they simply are calculations that adjust historical flows for upstream reservoir operations and current water use practices. Under natural conditions, the Sacramento Valley was inundated by high flows in most years. The consumptive use of these areas and the functions they provide must be considered if flow requirements are meant to mimic natural flows. (Estimates of Natural and Unimpaired Flows for the Central Valley of California: WY 1922-2014, DWR, March 2016). The functional flow approach described below more closely resembles and can serve as a surrogate for more natural flow paths in a state with a flood and water system designed for 39 million people.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding.</p> <p>Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>To the extent this comment could be construed as a general comment on unimpaired flows, please see Master Response 3.1, Fish Protection, for a discussion about percent of unimpaired flow as functional flow and how unimpaired flow is not equivalent to the natural flow regime. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, regarding the using the percent of unimpaired flow in the plan amendments, including information about functional flows.</p>
1164	15	<p>[From ATT1:]</p> <p>An unimpaired flow approach would have significant impacts on every beneficial use of water in the upstream areas in the Sacramento Valley.</p> <p>An unimpaired flow approach would significantly impact reservoir storage necessary to serve cities, rural communities, farms, fish, birds and recreation, particularly during dry years. Most notably, unimpaired flows would have significant impacts on reservoir storage, which would impact every one of these beneficial uses of water in the Sacramento Valley and throughout California. As discussed in MBK’s September 2012 material presented to the State Water Board (MBK, Evaluation of Potential SWRCB Unimpaired Flow Objectives – April 25, 2012), if a 50% unimpaired flow requirement were to be imposed impacts to the cold-water pools of Shasta, Oroville, and Folsom Reservoirs would be impacted in 80% of the years. In addition, these reservoirs would reach their dead pools in 20 to 40% of the years. In addition to such reductions in storage, increases in spring time releases also would deplete cold water supplies needed to protect salmon spawning downstream from</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding.</p> <p>Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p>

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		<p>reservoirs. Importantly, such an approach would further limit California’s ability to be prepared for future dry years, such as those we saw in 2014-15. This includes reducing cold water pools and management flexibility for salmon, reduced deliveries for birds along the Pacific Flyway (ricelands, refuges), and reduced deliveries and reliability for cities, rural communities and farms. By drawing so heavily on reservoir storage, this approach also would significantly limit California’s ability to prepare for drought conditions such as we have seen the past five years. Because flow requirements based on a percent of unimpaired flow would require increased reservoir releases in the spring before the irrigation season begins, it would not be possible to simply reduce agricultural diversions to satisfy these requirements.</p>	
1164	16	<p>[From ATT1:]</p> <p>The Draft SBR [Scientific Basis Report] lacks details about the potential activities that will be "further evaluated," including any coordinated actions concerning cold water habitats on the major tributaries. This deficiency, in addition to the lack of detail relative to the overall plan for implementation, prevents any meaningful evaluation of the potential benefits or impacts to, or trade-offs for, fisheries, birds, and water supply that would occur with such activities.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding.</p> <p>Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p>
1164	17	<p>[From ATT1:]</p> <p>The unimpaired flow approach would be counter to the recent state policies and direction regarding sustainable groundwater management, which will rely upon groundwater recharge and the conjunctive management of surface and groundwater resources to achieve these objectives. (see Water Code §§10720.1(g); 10727.4(e) and (f).) The unimpaired flow approach clearly would lead to significant additional groundwater pumping, which according to the Nature Conservancy’s 2014 report, Groundwater and Stream Interaction in California’s Central Valley: Insights for Sustainable Groundwater Management (see Appendix 6), would result in less recharge opportunities, could impact groundwater-supported ecosystems, and could have negative impacts on stream flows that are not fully developed for years or even decades. This would be counter to the Sustainable Groundwater Management Act (SGMA).</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding. Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>To the extent that this comment could be construed as a general comment regarding unimpaired flows and SGMA, the legislature passed SGMA in 2014 to address groundwater overdraft. However, SGMA compliance cannot occur at the expense of reasonably protecting surface water beneficial uses—both surface water and groundwater resources must be protected. A comprehensive approach to surface water and groundwater resources allows for integrated planning that does not trade impacts between surface water and groundwater.</p> <p>As stated in Chapter 9, Groundwater Resources, the State Water Board recognizes the negative impacts of overpumping groundwater. The plan amendments and SED do not require or encourage increased groundwater pumping to offset the reduction in surface water. The SED merely reflects the historical local response to increase groundwater pumping when surface water availability is reduced. It will be up to local entities to determine the precise actions that would be taken in response to the implementation of the plan amendments, with or without the future condition of SGMA.</p> <p>For further discussion on SGMA in the context of the plan amendments, groundwater recharge, and the potential for increased pumping, please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act.</p>
1164	18	<p>[From ATT1:]</p> <p>California should pursue functional flows for multiple beneficial purposes.</p> <p>California needs a 21st century water management approach that focuses on functional flows tailored for specific beneficial purposes. In California, every drop of water must have a specific purpose. Modern science is revealing that spreading water across the bypasses and</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding. Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>To the extent these comments can be construed as general comments regarding the use of a functional flow</p>

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		<p>the landscape in the Sacramento Valley and Delta (as a surrogate for natural system functions) will likely benefit fish and other species through food production and habitat. Importantly, the functional flow approach depends upon the special interactions between the water and the landscape. This approach already is underway and can be expanded in the Sacramento Valley.</p> <p>> The California Water Action Plan section on water flows describes a goal to “ensure sustainable river and estuary habitat conditions for a healthy, functional Bay-Delta ecosystem.” (See page 12.)</p> <p>> The Delta Stewardship Council (DSC) in its approved Delta Plan provides a solid overview of the functional flow approach in Chapter 4.</p> <p>> The past two Lead Scientists for the Delta Science Program were co-authors in a recent published report that found that in highly modified riverscapes (such as the Sacramento Valley), functional flows are a “more effective approach to identify and restore aspects of the flow regime that support key ecosystem functions and drive geomorphological and ecological processes.” (Yarnell et al., “Functional Flows in Modified Riverscapes: Hydrographs, Habitats and Opportunities (2015).</p> <p>> Local agencies in every part of the Sacramento Valley and its river systems already have re-managed flows for the benefit of salmon and steelhead in the past several decades. (“Re-managing the Flow.”) These include actions on the American, Bear, Feather, Sacramento and Yuba Rivers, as well as Mill Creek and various smaller watercourses. These flows all have been tailored for salmon and steelhead. These arrangements all began to be implemented after the last major update of the Water Quality Control Plan.</p> <p>> On the Sacramento Valley floor, water spread out and slowed down more closely mimics natural conditions and this water will serve multiple beneficial uses in a flow through system—cities and rural communities, farms, birds along the Pacific Flyway, food for fish, recreation. A recent example is the program in the Sacramento Valley during the summer to implement the 2016 North Delta Food Web Action as part of the Delta Smelt Resiliency Strategy (July 2016).</p> <p>> Recent energetics models for birds and the Pacific Flyway have shown the value and importance of functional flows for food production and habitat along the Pacific Flyway, which includes ricelands and refuges. Recent actions for Delta smelt food production in the Yolo Bypass have shown the same promise and various efforts to grow and nurture small salmon on ricelands have suggested better salmon survival than in the sterile channelized river. (The Sacramento Valley and Waterfowl and Duck’s Unlimited comments submitted to the State Water Board, incorporated by reference.)</p>	<p>approach, please see Master Response 2.1, Amendments to the Water Quality Control Plan, and Master Response 3.1, Fish Protection, for a discussion of unimpaired flow as functional flow. Please see Master Response 2.2, Adaptive Implementation, for a more detailed description of the adaptive implementation methods in the program of implementation that allow the water budget provided by the percent unimpaired flow objective to be shaped to create flows for targeted biological functions such as maximizing habitat, temperature, and other benefits to better maximize achievement of the LSJR narrative flow objective.</p> <p>Please also see Master Response 1.1, General Comments, for a discussion of the Bay-Delta Plan’s relationship with other plans, including the California Water Action Plan.</p>
1164	19	<p>[From ATT1:]</p> <p>Listen to the new science regarding opportunities for functional flows.</p> <p>The State Water Board and other state and federal agencies should continue to enlist the Delta Science Program and the Independent Science Board, a leading group of scientists, to provide guidance to state and federal agencies with respect to Delta science. Water suppliers across the state on July 19, 2016 sent a letter to the SWRCB suggesting a new approach is necessary and encouraging the SWRCB and other agencies to listen to the new</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding. Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>For more detail regarding this proceeding, please see Master Response 1.2, Water Quality Control Planning Process. In addition, to the extent this comment could be construed as a general comment on functional flows, please see Master Response 3.1, Fish Protection, regarding unimpaired flows as functional flows, and</p>

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		<p>science surrounding flows. We strongly encourage the State Water Board to listen closely to the Lead Scientist and the Independent Science Board comments and incorporate modern science into the scientific basis. In this regard, we recommend and request that the SWRCB issue and pose the listed questions set forth in Appendix 12 [not attached] to any independent review of the draft scientific basis report, including in particular, the peer review to be conducted pursuant to California Health & Safety Code §57004.</p>	<p>regarding the scientific basis and peer review process.</p>
1164	20	<p>[From ATT1:]</p> <p>Negotiated resolutions can lead to effective functional flow approaches.</p> <p>Regulatory solutions do not seem to be working well for any beneficial uses that depend on water in the Sacramento Valley or the Delta. Moreover, further regulatory actions will generally take decades to implement. On the other hand, the California Water Action Plan calls for a coordinated and collaborative approach that encourages negotiated voluntary agreements. (Page 18.) The Resources Secretary and you exchanged letters in November 2015 reiterating your mutual commitment to voluntary agreements. On September 19, 2016, the Governor again directed agencies to pursue negotiated agreements. For this administration to be successful in the water arena, negotiated resolutions (not regulatory actions) that pursue functional flows and other measures will be essential and will lead to more sustainable outcomes. The Sacramento Valley Water Users are committed to a negotiated resolution and voluntary agreements for the Sacramento Valley and the Delta.</p>	<p>The attachment is addressing a proceeding outside of the plan amendments. Please see response to comment 1164-1 regarding the scope of the plan amendments and SED in this proceeding. Please see Master Response 1.1, General Responses, for responses to comments that do not raise significant environmental issues associated with the analysis contained within the SED or request a modification to the plan amendments.</p> <p>To the extent this comment could be construed as a general comment regarding voluntary agreements, please see Master Response 1.1, General Comments, and Master Response 2.1, Amendments to the Water Quality Control Plan, regarding voluntary agreements. Please also see Master Response 1.1 for a discussion of the Bay-Delta Plan's relationship with other plans, including the California Water Action Plan.</p>
1164	21	<p>[ATT2: Exhibit B: SWRCB Bay-Delta Water Quality Control Plan Workshop. Northern California Water Association/Sacramento Valley Water Users. September 6, 2012.]</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1164	22	<p>[ATT3: Exhibit C: Retrospective Analysis of Changed Central Valley Project and State Water Project Conditions Due to Changes in Delta Regulations. Water and Power Policy Group. January 2013.]</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1164	23	<p>[ATT4: Exhibit D: Workshop on Delta Outflows and Related Stressors Panel Summary Report. Delta Stewardship Council. May 5, 2014.]</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	1	<p>The Draft SED is technically and legally flawed. The SWC provided a detailed explanation of our concerns with the Draft SED in a comment letter that the SWC filed jointly with SLDMWA [San Luis and Delta Mendota Water Authority] in 2013. Those comments were not addressed in the 2016 Draft SED. As a result, we are resubmitting the SWC's March 2013 joint comment letter on the draft SED as Attachment A [see ATT1] because the comments and issues raised in 2013 remain applicable. The SWC are also providing specific comments on 2016 Draft SED groundwater analysis. (See Attachment B [ATT2].)</p> <p>For emphasis, the SWC are reiterating and expanding our prior comments related to two specific issues: (1) use of unimpaired flow as a compliance metric, and, (2) imposition of permit conditions on the State Water Project (SWP) and Central Valley Project (CVP) to install temporary barriers in the south Delta.</p>	<p>The commenter has attached comments previously submitted on the 2012 Draft SED. A lead agency need only respond to those comments submitted in response to a recirculated revised environmental document and is not required to respond to comments previously received during the earlier circulation period on a previous draft. In its September 15, 2016 notice of filing, recirculation, and opportunity for public comment on the revised SED, the State Water Board made clear that since, "the SED is being recirculated in its entirety, new oral and/or written comments must be made and submitted for the SED. Previous comments to the 2012 Draft SED will be part of the administrative record, but do not require a written response. The State Water Board will only respond to those timely comments made and submitted in response to the recirculated SED." Therefore, Attachment A is part of the administrative record, but will not receive a written response.</p> <p>Responses to Attachment B, Technical Memorandum: Water Quality Control Plan, Phase 1, 2016 SED – Groundwater, are included in these responses to comments.</p>
1165	2	<p>Unimpaired Flow is an Inappropriate Metric.</p> <p>The Water Board continues to propose flow actions based on the unimpaired flow concept. The SWC believe that unimpaired flow is an inappropriate metric for setting water quality</p>	<p>Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for a description of the plan amendments, including the percent of unimpaired flow requirement, and the distinction between unimpaired flow and natural flow. The master response also discusses how the unimpaired flow objective is compatible with and facilitates functional flows that improve fish and wildlife protection. Please see</p>

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		<p>objectives. Detailed support for our position was provided in response to the initial draft SED in 2013. (See Attachment A [ATT1]). Recent advances in science further support our position on unimpaired flow; these advances are summarized in our December 15, 2016, comment letter to the Water Board regarding its working draft Phase II WQCP Technical Basis Report (provided as Attachment C [ATT3]) and incorporated by reference. The currently proposed WQCP amendments and use of unimpaired flow as a compliance metric is incongruent as described below.</p> <p>Unimpaired flow is not a proxy for pre-development or “natural” flow.</p> <p>Best available science shows that unimpaired flow from the upstream San Joaquin River tributaries is not an appropriate measure for natural flow on the valley floor or in the Delta. For example, see recent supporting scientific work by Howes et al. (2015) [Footnote 1: Howes, D.J., Fox, P., and Hutton, P.H. (2015). Evapotranspiration from Natural Vegetation in the Central Valley of California: Grass Reference-Based Vegetation Coefficients and the Dual Crop Coefficient Approach, Journal of Hydrologic Engineering, DOI: 10.1061 / (ASCE) HE.1943-5584.0001162] on the evapotranspiration from natural vegetation that was present in the Delta and Central Valley, work by Fox et al. (2015) [Footnote 2: Fox, P., Hutton, P.H., Howes, D.J., Draper, A.J., and Sears, L. (2015). Reconstructing the Natural Hydrology of the San Francisco Bay-Delta Watershed, Hydrology and Earth System Sciences, 19, 4257-4274] that quantifies the expected mix of vegetation in the Delta and Central Valley under natural or pre-development conditions, and work by Huang (2016) [Footnote 3: Huang, G. (2016). Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014, California Department of Water Resources, Bay-Delta Office, March, Draft] that utilized the above-cited work to compare annual and seasonal unimpaired and natural Delta outflow estimates. Huang found, similar to Fox et al. (2015), that unimpaired outflow estimates are a very inaccurate proxy for natural outflow estimates, significantly overestimating natural flows, because natural flows were not subject to the confines of levees, dams, and other anthropogenic development and as such, spread over greater areas of the basin. Given that the best available science shows unimpaired flow to be an inappropriate indicator of natural flow on the valley floor or in the Delta, proposed flow standards should be justified based on flow function and not on purported benefits of unimpaired flows, which do not emulate natural conditions, nor provide the same functions. Thus, using unimpaired flow criteria as an accounting tool cannot be:</p> <ul style="list-style-type: none"> * Justified as a means to improve habitat conditions through restoration of natural flow conditions, functions, etc. * Used as a justification for the need to increase required flows on the valley floor and/or in the Delta. * Used as a baseline from which to measure annual or seasonal trends in flows on the valley floor or in the Delta. 	<p>Master Response 3.2, Surface Water Analyses and Modeling, regarding the calculation of unimpaired flow and the distinction between natural and unimpaired flow. In addition, please see Master Response 3.1, Fish Protection, regarding the unimpaired flow approach and how this approach is not a representation of natural flow conditions. The master response also discusses best available science and the scientific basis and justification for the unimpaired flow approach in the plan amendments.</p>
1165	3	<p>The Water Board’s proposal to “sculpt flows” is analytically disconnected from concept of mimicking the hydrograph.</p> <p>The unimpaired flow compliance metric is based on DWR’s calculation as a means to define a pool of water for adaptive management for the intended purpose of “sculpting” flows. The recirculated Draft SED does not identify the types of actions needed to “sculpt” flows, and therefore it is unclear how the Water Board intends to implement the flow actions. The</p>	<p>Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for a description of the plan amendments.</p> <p>Please refer to Master Response 2.2, Adaptive Implementation, for more information about the elements of adaptive implementation, examples of flow shaping and regarding how adaptive implementation can be implemented. The master response explains how the numeric objective provides flows that more closely mimic natural hydrograph conditions, but flows can also be adjusted, shaped, or shifted if information</p>

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		<p>SWC recommend that the Draft SED be revised to provide examples of flow types being proposed, as well as the conceptual model that the Water Board would be evaluating in its adaptive management plan. The Draft SED cites literature supporting the idea that a percent of the natural hydrograph be preserved as a method for restoring the Delta ecosystem. However, the Water Board is really proposing a plan where it would “sculpt” flows, not necessarily in proportion to unimpaired flows. Therefore, the cited literature does not support the intended action. It should be further noted, as the water contractors and others explained during the 2012 Water Board workshops, the literature relevant to using unimpaired flows as a restoration tool cautions that the outcome, particularly in highly altered systems, is highly uncertain. For example, see Poff et al. (1997) [Footnote 4: Poff, N.L., Allen, D., Bain, M.B., Karr, J.R., Prestegard, K.L., Richter, B.D., Spaerks, R.E., Stromberg, J.C. (1997) The Natural Flow Regime: A Paradigm for River Conservation and Restoration. <i>BioScience</i>, 47:11], Poff and Zimmerman (2010) [Footnote 5: Poff, N.L., and J.K.H. Zimmerman. 2010. Ecological Responses to Altered Flow regimes: A Literature Review to Inform the Science and Management of Environmental Flows. <i>Freshwater Biology</i> 55: 194: 205], Pierson et al (2002) [Footnote 6: Pierson, H.A., and M. Vayssieres. (2010) Benthic assemblage variability in the Upper San Francisco Estuary: A 27-year retrospective. <i>San Francisco Estuary and Watershed Science</i>, 8(1)], and Bunn and Arthington (2002) [Footnote 7: Bunn, S.S., and A.H. Arthington. (2002) Basic Principles and Ecological Consequences of Altered Flow Regimes and Aquatic Biodiversity. <i>Environmental Management</i> 30: 492-507].</p>	<p>supports that shaping the flows better achieves the narrative goal of supporting San Joaquin River watershed fish populations. The master response also explains how adaptive implementation can enhance the benefits of flow and flow-related functions using the unimpaired-flow to develop a block of water and shaping the block to emphasize certain features of the hydrograph to better achieve the narrative goal of supporting San Joaquin River watershed fish populations. The rationale presented in the master response is consistent with the cited literature.</p> <p>Please see Master Response 3.1, Fish Protection, which discusses the justification for the unimpaired flow approach and the best available science.</p>
1165	4	<p>The Water Board’s proposal is not a “functional flow.”</p> <p>During a recent Water Board workshop, there was a definitional discussion about what is a “functional flow.” The SWC have been discussing the need for functional flows for many years, so knowing that there is a misunderstanding regarding the use of this term is informative. Based on the literature, the SWC define a functional flow as supporting a specific ecological function that is relevant to one or more native fish species. It requires investigating conditions under which native fish evolved, how those conditions have changed, and what can be done to restore those conditions within the context of today’s highly altered system. Historically, the water and landscape were much more interconnected with high flows spilling out onto the landscape creating spawning and rearing habitat, and feeding the rivers as flows slowly drained back into the main channels carrying nutrients, detritus, and lower trophic organisms produced in these nutrient rich, often shallow and slow moving waters, among other important functions. Merely putting more water down rip-rap lined levees does not re-create these historical conditions. The best opportunities for restoring functional flows may be in areas where some remnant of the pre-development environment still exists, like floodplains, or in the restoration of these land-water connections elsewhere (see SFEI 2014 [Footnote 8: San Francisco Estuary Institute (2014) A Delta Transformed, ecological functions, spatial metrics, and landscape change in the Sacramento-San Joaquin Delta, prepared for the California Department of Fish and Wildlife and Ecosystem Restoration Program]). In the highly altered Central Valley and Delta, the unimpaired flow concept is not the same as functional flow or natural flow, as it would merely provide for transport functions (i.e., increasing the depth and velocity of water in leveed and rip rapped channels) without providing for other important functions such as turbidity, nutrients, detritus and appropriate temperatures.</p> <p>The Water Board should reconsider the information provided in these attachments and revise the proposed amendments to the 2006 WQCP and Draft SED accordingly.</p>	<p>Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for a description of the plan amendments, and how the unimpaired flow objective is compatible with, and facilitates, functional flows that improve fish and wildlife protection. Please refer to Master Response 3.1, Fish Protection, for additional discussion on unimpaired flow as functional flow and adaptive implementation.</p> <p>In addition, please see response to comment 1165-2 for information on unimpaired flow versus natural flow.</p>

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Ltr#	Cmt#	Comment	Response
1165	5	<p>The implementation of temporary agricultural barriers to address water levels should be reconsidered.</p> <p>The Water Board’s proposal includes continued installation of the temporary agricultural barriers, and even provides some analysis of permanent agricultural barriers. The Water Board should reconsider the continuation of the agricultural barrier program to address water level issues.</p> <p>The Draft SED reports that the maximum potential effect of combined SWP-CVP pumping is 1.5 ft. on the high tide and .75 ft. on the low tide. (Draft SED at p. 5-37.) The Draft SED further reports that the barriers increase water levels by 1 ft. to 2 ft. (Ibid.) This shows the relatively minor effect of maximum combined SWP-CVP pumping on south Delta water levels. It further illustrates the over mitigation of water level effects provided by the barriers.</p> <p>The Draft SED does not consider the current environmental effect of the barriers on the environment, including the fishery, as it is an existing condition. However, the Water Board should consider whether the barriers have unintended biological effects, and whether those effects are justified in light of the negligible effect that SWP-CVP exports have on water levels. The Water Board should also consider if there are other feasible alternatives to barriers.</p> <p>The Water Board should reconsider the continuation of the temporary agricultural barrier program, adopting alternative implementation measures such as irrigation management (scheduling), consolidating diversions and extending agricultural pumps.</p>	<p>The SDWQ plan amendments require DWR and USBR to address the effects of SWP and CVP export operations on water levels and flow conditions that might affect southern Delta salinity conditions. The plan amendments do not mandate continued operation of the agricultural barriers, but instead identify the continued operation of the barriers as one possible tool to address the effects of export operations. Other reasonable measures may be considered. Please see Master Response 3.3, Southern Delta Water Quality, for a discussion regarding temporary barriers and the responsibilities of DWR and USBR for the SDWQ objectives. See Appendix K, Revised Water Quality Control Plan, for the plan amendments, including the Comprehensive Operations Plan that will evaluate design and operations of the barriers or other measures.</p>
1165	6	<p>The implementation of temporary agricultural barriers to address interior south Delta salinity should be reconsidered.</p> <p>The Water Board continues to propose permit conditions on the SWP-CVP to install temporary barriers to provide salinity control in the south Delta. This proposal is based on the flawed conclusion that, “EC values in the southern Delta are affected primarily by...the combined CVP and SWP pumping influencing salinity in the southern Delta...” (Draft SED at p. 5-44.) As the SWC explained in its comments on the prior SED (Attachment A [see ATT1]), and as DWR and Reclamation have demonstrated on numerous occasions over the last three decades, the SWP-CVP are unable to control salinity at all locations in the south Delta. In our 2013 comment letter, the SWC provided a CD containing DWR’s extensive DSM2 modeling that specifically analyzed the effects of the SWP-CVP on water quality, water levels, and circulation with and without the temporary barriers. The SWC believe that its prior letter, with attachments, sufficiently demonstrate that SWP-CVP operations cannot control water quality in the area east of the SWP-CVP pumping facilities, in the vicinity of Old River at Tracy River Bridge. In other areas of the south Delta, particularly near the SWP-CVP pumping facilities, the operation of the SWP-CVP maintains conditions significantly fresher than would exist without the projects.</p> <p>The Water Board’s implementation plan for south Delta salinity standards should not allocate responsibility to the SWP-CVP, and should not require the installation of agricultural barriers. The Draft SED identifies other sources of water quality degradation and those sources should be the Water Board’s focus during the implementation phase.</p>	<p>Please see responses to comments 1165-1 and 1165-5. The SED material quoted in this comment is potentially misleading quoted in isolation because it does not provide the full context of the SED’s discussion of the factors affecting salinity in the southern Delta. Only part of the SED’s sentence was provided in the comment. The full sentence in section Water Quality and Salinity in Chapter 5, Surface Water Hydrology and Water Quality is: “EC values in the southern Delta are affected primarily by the salinity of water flowing into the southern Delta from the SJR at Vernalis, salt discharged back into southern Delta channels that was previously diverted for irrigation, the combined CVP and SWP pumping influencing salinity in the southern Delta, and tidal mixing of inflow from the Pacific Ocean.” The full text acknowledges that various factors affect salinity in the southern Delta.</p>

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Ltr#	Cmt#	Comment	Response
1165	7	<p>The SWC support voluntary agreements.</p> <p>The SWC support the Water Board’s consideration of voluntary agreements as an implementation mechanism in the amended WQCP to help achieve the water quality objectives to benefit various beneficial uses. To the extent that the Water Board would like to discuss alternative actions that are achievable and likely to provide targeted benefits, the SWC would be pleased to participate in such discussions. The SWC and its members are involved in many collaborative scientific efforts, scientific studies (including field work), and habitat restoration projects. The SWC have been, and will continue to take proactive steps to improve Delta water quality and the Delta ecosystem, and would be willing to partner with the Water Board to find achievable and resilient solutions.</p> <p>We look forward to continuing the dialog with the Water Board with the shared goal of developing an effective, viable and integrative proposal for the San Francisco Bay-Sacramento San Joaquin Delta Estuary.</p>	<p>Please see Master Response 1.1, General Comments, for information regarding voluntary agreements.</p>
1165	8	<p>[ATT1:]</p> <p>Attachment A -- Letter to SWRCB from State Water Contractors and San Luis & Delta-Mendota Water Authority re: Comments on the 2012 Bay-Delta Plan SED. Dated March 29, 2013.</p>	<p>This attachment is a set of comments on the 2012 Draft SED. A lead agency need only respond to those comments submitted in response to a recirculated revised environmental document and is not required to respond to comments previously received during the earlier circulation period on a previous draft. In its September 15, 2016 notice of filing, recirculation, and opportunity for public comment on the revised SED, the State Water Board made clear that since, “the SED is being recirculated in its entirety, new oral and/or written comments must be made and submitted for the SED. Previous comments to the 2012 Draft SED will be part of the administrative record, but do not require a written response. The State Water Board will only respond to those timely comments made and submitted in response to the recirculated SED.” Therefore, this attachment will not receive a written response, but is part of the administrative record.</p>
1165	9	<p>[ATT1:ATT3:]</p> <p>Attachment 3 -- List of References for Attachment 2: Detailed Comments on [2012] Draft Amendments to the Bay-Delta Plan and [12/31/2012] Draft SED [ATT1:ATT2]</p>	<p>The commenter provided this attachment for reference purposes in support of their comments on the 2012 Draft SED. Please refer to response to comment 1165-8.</p>
1165	10	<p>[ATT1:ATT4:]</p> <p>Attachment 4 -- Relevant Legal Standards and Rules Concerning Water Use and Water Quality</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	11	<p>[ATT1:ATT5:]</p> <p>Attachment 5 -- Representations of Discharges By Grasslands Bypass Project</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	12	<p>[ATT1:ATT5:ATT1:]</p> <p>Table 1 -- Discharge Comparison from Grassland Drainage Area Values October thru September</p>	<p>The commenter is providing this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	13	<p>[ATT1:ATT5:ATT2:]</p> <p>Figure 1 -- Grassland Bypass Project Location Map</p>	<p>The commenter is providing this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	14	<p>[ATT1:ATT5:ATT3:]</p>	<p>The commenter is providing this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>

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Ltr#	Cmt#	Comment	Response
		<p>Figure 2 -- Graph of Grassland Drainage Area Salt Load per Year</p> <p>Prepared by: Summers Engineering, Inc.</p>	
1165	15	<p>[ATT2:]</p> <p>Attachment B -- Technical Memorandum: Water Quality Control Plan, Phase 1, 2016 SED - Groundwater</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	16	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Draft SED at p.9-3. The Draft SED states: “This analysis assumes that an average annual reduction in the groundwater balance for a subbasin by increased groundwater pumping and reduced recharge from surface water equivalent to 1 inch or more of water across the subbasin could be potentially significant”</p> <p>Comment: There is no support provided for this level of significance. It is also somewhat misleading, as a 1 inch reduction in net recharge would result in several times greater impacts on groundwater levels. (See Draft SED at p. 9-46.) Moreover, effects on groundwater levels are cumulative, so an annual impact of 1-inch reduction in net recharge could lower groundwater levels by several feet over a period of years.</p>	<p>Please see responses to comments 1165-148 and 1165-149.</p>
1165	17	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Draft SED at p. 9-3. The Draft SED states: “However, since the groundwater projections that will be afforded by SGMA cannot be determined at this time with precision, this chapter evaluated the potential impacts on groundwater levels from LSJR alternatives without including SGMA as an ameliorating factors...”</p> <p>Comment: While it may not be possible to precisely determine the exact management actions that agencies will take to comply with SGMA, it is possible to identify a potential range of actions. SGMA requires proactive measures to address undesirable conditions such as “chronic lowering of groundwater levels.” Agencies will be required to take actions to avoid those kinds of impacts, which have not been analyzed in the SED. General actions that would be required to meet SGMA would include increasing recharge, which could be severely limited due to the constraints on impairment of flow being proposed in the Draft SED or reductions in consumptive use. These actions could be analyzed with available modeling analysis and the economic impacts of these measures to deal with SGMA could be analyzed with the economic analysis methodology presented in Chapter 20.</p> <p>The SED goes on to make the statement that “estimates of impacts are likely more conservative (i.e., worse) than would occur in the groundwater basins over time.” (Ibid.)</p>	<p>Please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act, regarding the approach to analyzing impacts on groundwater resources, modeling and the use of groundwater data, criteria for evaluation (e.g., the one-inch regional threshold), and the SED’s consideration of SGMA. This master response also explains why site-specific modeling is not used in the SED. Please also see Master Response 1.1, General Comments, for general information on the programmatic scope of the SED, the adequacy of the SED and the approach and methodology employed, and the substantial evidence standard.</p> <p>The level of detail in the SED is reasonable and appropriate for a program-level analysis and is not meant to be, nor required to be, a site-specific analysis. Groundwater models are site-specific and beyond the scope of the SED.</p> <p>The SED and plan amendments do not require or encourage increased groundwater pumping. The SED analyses reflect that the historical local response to reduced surface water availability has been to choose to increase groundwater pumping; therefore, the SED was required to analyze this reasonably foreseeable and potentially significant and unavoidable impact on the groundwater basin from this local response. As discussed in Chapter 9, it is speculative to assume how pumpers in the plan area will respond to implementation of the LSJR flow objectives, because it will depend on many individual and collective decisions including, but not limited to, implementation of SGMA. However, if pumpers choose to maintain existing levels of water use by replacing reduced surface water with groundwater, the SED recognizes there could be significant decreases in groundwater levels in the plan area.</p> <p>Chapter 9 also describes the baseline interaction between rivers and groundwater in the plan area (e.g., seepage), and explains “[i]n either the losing or gaining scenario, groundwater-surface water interactions are</p>

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Ltr#	Cmt#	Comment	Response
		<p>Because the SED incorrectly estimates reductions in groundwater recharge/discharge using a semi-quantitative framework, the statement that estimates of impacts are more conservative is incorrect. The semi-quantitative analysis presented in this chapter is inaccurate and does not identify significant environmental impacts to both groundwater and surface water flows. To properly analyze groundwater impacts of the proposed revisions in the Water Quality Control Plan (“WQCP”), a groundwater model or a similar quantitative analysis framework should be used. There are existing groundwater models that are capable of making the required analysis, e.g., the Department of Water Resources’ California Central Valley Groundwater-Surface Water Simulation Model (C2VSIM) and the U.S. Geological Survey’s Central Valley Hydrologic Model. Either of these existing models could have been used to analyze the groundwater impacts of increased groundwater pumping (as assumed by the Draft SED analysis) or of water management practices that would comply with SGMA.</p> <p>Instead of using the available modeling tools, the SED uses a semi-quantitative analysis which is deficient and ignores groundwater-surface water interactions. The SED semi-quantitative analysis identifies the net change in average annual groundwater balance and identified impacts of greater than 1-inch as significant. The basis for designating 1-inch as a level of significance is not disclosed. The SED should also have identified the effects of the assumed increase in groundwater use in terms of factors that decision-makers could readily understand, like declines in water levels.</p> <p>Since the groundwater basin accumulates changes in the groundwater balance over time, the SED should have identified long-term cumulative declines in groundwater levels.</p> <p>The SED analysis fails to identify the effects of increased groundwater pumping and water levels; the changes that would occur to surface water flows are not identified. The increased groundwater use that would result from the reductions in surface diversion capability would cause lower groundwater levels that would cause large reductions in groundwater accretions to local streams and would likely result in seepage losses from those streams. As a result of the increased groundwater use, local stream systems would change from mostly gaining streams to mostly losing streams, with reductions in flow downstream. Those reductions in flow were not identified due to the defective SED analysis.</p>	<p>unlikely to have a large impact on total river flow.” A detailed discussion regarding the assumptions for the groundwater balance methodology used in the groundwater impact analysis is provided in Appendix G, Agricultural Economic Effects of Lower San Joaquin River Flow Alternatives: Methodology and Modeling Result. Section G.3, Estimation of Groundwater Balance, explains that multiple factors, including stream-groundwater interaction, are assumed to be constant for each LSJR alternative because the effect of changes in these factors would be relatively small compared to the changes expected in groundwater recharge and increased pumping.</p> <p>Please see Master Response 6.1, Cumulative Analysis, and Chapter 17, Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources, regarding the cumulative impacts of SGMA and the plan amendments, and the growth-inducing effects of the plan amendments.</p>
1165	18	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Page 9-14. The Draft SED states: “For example, based on modeling results performed for San Joaquin County to simulate a 5-year period (1989-1993), the Tuolumne River and upper WSJR were gaining rivers, while the Stanislaus River and LSJR (from the Merced River to Vernalis) were losing rivers (NSJCCBA 2004).”</p> <p>Comment: This discussion is not consistent with other modeling of the area (e.g., USGS. 2009. Groundwater Availability of the Central Valley Aquifer, California. Professional Paper 1766. Groundwater Resources Program. Edited by C.C. Fount, p. 48). The discrepancy between the USGS modeling results and the Draft SED analysis may be due to the NSJCCBA model being interpreted outside of its primary analysis area in locations where results are</p>	<p>Chapter 9 states, “The upper reaches of the Stanislaus, Tuolumne, and Merced Rivers (downstream of Goodwin, La Grange, and Crocker-Huffman Dams) are losing rivers, with groundwater recharged by streamflow. The lower reaches of the rivers are gaining rivers, with groundwater discharging to the rivers (TGBA 2008; MAGPI 2008).”</p> <p>Chapter 9 further states, “Other studies indicate that the SJR downstream of the Merced River is gaining (USGS 2015). Modeling results of groundwater-surface water interactions are not entirely consistent with this upstream versus downstream pattern. For example, based on modeling results performed for San Joaquin County to simulate a 5 year period (1989–1993), the Tuolumne River and upper SJR were gaining rivers, while the Stanislaus River and LSJR (from the Merced River to Vernalis) were losing rivers (NSJCCBA 2004).”</p> <p>Chapter 9 clarifies, “In either the losing or gaining scenario, groundwater-surface water interactions are unlikely to have a large impact on total river flow. A recent modeling study of a region east of the SJR extending from north of the Stanislaus River to south of the Merced River indicated that groundwater-surface water interactions have a relatively small effect on river flow, generally changing flow by plus or</p>

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		likely not well calibrated. As noted previously, the SED could have actually applied an existing groundwater model which would have provided results specific to the proposed management actions.	minus 2 cubic feet per second (cfs) per mile (USGS 2015).” The SED presents relevant scientific evidence and reasonably characterizes the current understanding of groundwater-surface water interaction in the project area. For the reasons discussed in the SED, further refinement of this understanding as part of this project is infeasible. Moreover, further refinement of the understanding of groundwater-surface water interaction would not change any determinations of significance because these interactions are unlikely to have a large impact on river flow. Please refer to response to Comment 1165-148.
1165	19	[From ATT2:] There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows: Page 9-14. The Draft SED states: “In either the losing or gaining scenario, groundwater-surface water interactions are unlikely to have a large impact on total river flow. A recent modeling study of a region east of the SJR extending north of the Stanislaus River to south of the Merced River indicated that groundwater-surface water interactions have a relatively small effect on river flow, generally changing flow by plus or minus 2 cubic feet per second (cfs) per mile (USFS 2015).” Comment: The discussion here is based on prior analyses of groundwater that do NOT include the proposed additional pumping that would occur from the surface management actions specified in the SED along with lack of compliance with SGMA requirements. The increase in groundwater pumping that would occur due to the reduced surface diversions indicated in the SED would reduce groundwater levels beyond the assumptions used in the cited modeling reports. Use of available groundwater models would have identified the extent to which surface water flows would be changed by pumping.	Please see responses to comments 1165-148 and 1165-149.
1165	20	[From ATT2:] There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows: Page 9-15. The Draft SED states: “However, it is difficult to determine the sustainable yield of a subbasin because of the large degree of uncertainty associated with all components of the water budget. This includes the difficulty of determining whether a certain level of groundwater pumping will reduce accretions to surface water bodies by an amount that will be detrimental to surface water resources.” Comment: Although there is some level of uncertainty associated with elements of the water balance, a water balance approach was used by the SED to identify impacts. With use of available groundwater models, an initial estimate of sustainable pumping would have been possible and it could have been refined to maintain accretions to surface water bodies at identified levels. The Draft SED analysis chose to not do this analysis, and instead relied on a semi-quantitative analysis which has the same defects in terms of uncertainty in water	Please see responses to comments 1165-148 and 149. The two statements referenced in the comment do not contradict one another. The statement on P. 9-14 describes the baseline groundwater-surface interaction in the plan area. The statement on P. 9-15 describes the factors (e.g., groundwater pumping) and uncertainty involved in determining sustainable yield that can affect groundwater-surface interactions.

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		<p>balance. Stated differently, the Draft SED states that the data is too uncertain to support the appropriate modeling analysis, but then nevertheless uses that same data for its semi-quantitative analysis.</p> <p>Additionally, the statement concerning reduced accretions directly contradicts prior statements (which are probably incorrect) on Draft SED p. 9-14 that “groundwater-surface water interactions have a relatively small effect on river flow.”</p>	
1165	21	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Page 9-44 -- Geographical Treatment of Aquifer</p> <p>Comment: The discussion of the basis for not assessing the effects of the LSJR alternatives on different aquifers could have been avoided if the SED had actually used the available groundwater models of the analysis area.</p>	Please see responses to comments 1165-148 and 1165-1149.
1165	22	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Page 9-45 -- Assessment of Irrigation District Groundwater Pumping</p> <p>Comment: There is no reason to believe that groundwater pumping would be limited to historical or current levels of installed groundwater pumping capacity. In the absence of new restrictions on wells, additional groundwater pumping capacity would likely be installed, which is what has happened in recent years.</p>	<p>Please see Master Response 3.2, Surface Water Analyses and Modeling, regarding the Water Supply Effects (WSE) model assumptions for groundwater pumping. Minimum and maximum groundwater pumping estimates were based on an evaluation of irrigation district pumping estimates in CALSIM, 2012 AWMPs, 2010 GWMPs, and information provided by the irrigation districts. Chapter 9, Groundwater Resources, acknowledges the various sources of groundwater information available and uncertainty related to groundwater information. See also Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act, for information regarding the groundwater analyses, including baseline groundwater pumping. For discussion on State Water Board use of best available science, SGMA, and groundwater resources, please see Master Response 1.1, General Comments.</p> <p>Please see responses to comments 1165-148 and 1165-1149.</p>
1165	23	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED’s conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board’s proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act (“SGMA”). Specific comments are as follows:</p> <p>Page 9-46 -- “Normalizing the change in groundwater balance by the subbasin area translates the effect into height and directly shows how average groundwater level could be impacts under the LSJR alternatives.”</p> <p>Comment: This is not an accurate statement of the effect of changes in groundwater balance. As described in the next paragraph, the effects of the change in groundwater balance in an unconfined aquifer (which is the most common occurrence in the Lower San Joaquin Valley) must be adjusted for the specific yield, which multiplies the actual water level effect by a factor of 10 to 14. Additionally, the groundwater level changes are cumulative, meaning that continued changes in groundwater balance of 1 inch per year</p>	Please see response to comment 1165-148 regarding the SED criteria for evaluating impacts to groundwater resources. See also response to comment 1165-149.

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		<p>could cause several feet of decline. The actual impact on groundwater levels is the most meaningful indication of groundwater impacts and should have been estimated directly using one of the existing available groundwater models. The other effects that are not addressed by the SED, which would be identified through use of existing available groundwater models, are the effects on accretions to or seepage from local streams.</p>	
1165	24	<p>[From ATT2:]</p> <p>There is weak evidence to support the [2016] Draft SED's conclusions. The groundwater analysis should have utilized existing models to analyze the likely cumulative effect of the Water Board's proposed changes to the WQCP and the implementation of the Sustainable Groundwater Management Act ("SGMA"). Specific comments are as follows:</p> <p>Page 9.4.3 -- Impacts and Mitigation Measures</p> <p>Comment: As identified previously, the SED does not identify the cumulative impacts on groundwater levels and groundwater-surface water flow interaction. These effects could have been analyzed through application of the changes in net recharge identified by the WSE to one of the existing groundwater models. The approach to impacts is very indirect, does not disclose the actual effects on groundwater levels for decision makers, and does not disclose the effects on groundwater-surface water interactions that could have a significant adverse effect on streamflows.</p>	<p>Please see responses to comments 1165-148 and 1165-1149.</p>
1165	25	<p>[ATT3:]</p> <p>Attachment C -- Letter to SWRCB from State Water Contractors re: Comments on the Bay-Delta Phase II Working Draft Science Report. Dated December 15, 2016.</p>	<p>The commenter provided this attachment for reference purposes in support of their comments. Those comments are addressed in these responses to comments; therefore, no additional response is required.</p>
1165	26	<p>[From ATT3:]</p> <p>To the extent that the Water Board would like to discuss alternative actions that are achievable and likely to provide species benefits outside of a technical review of the Phase II Report, the SWC would be pleased to participate in such discussions. The SWC and its members are involved in many collaborative scientific efforts, scientific studies (including field work), and habitat restoration projects. The SWC have been, and will continue to take proactive steps to improve the Delta ecosystem, and would be willing to partner with the Water Board to find achievable and resilient solutions.</p>	<p>Please see Master Response 1.1, General Comments, regarding collaboration with agencies.</p>
1165	27	<p>[From ATT3:]</p> <p>It is unfortunate that the Phase II Report does not provide a scientific basis for realistic solutions. Overall, the SWC are extremely disappointed by the analysis contained in the Phase II Report. The document appears to have been written in 2010, providing only a few selected references to the more recently published literature. To the extent new analyses are included in the Phase II Report, those references are most often to analyses that are preliminary, unpublished, and not peer reviewed.</p> <p>The Phase II Report does not contain a discussion of the best available science and fails to provide uncertainties associated with the science cited. This type of information is critical to provide Water Board members with a tool to make decisions in the future. As currently drafted, this report does not provide an unbiased discussion of the scientific literature.</p>	<p>This comment addresses the Sacramento Bay-Delta watershed update, and not this proceeding. It does not make a general comment regarding the plan amendments or raise significant environmental issues. Please see Master Response 1.2, Water Quality Control Planning Process, for a discussion of the water quality control planning process, including the State Water Board's protection of beneficial uses in the Bay-Delta and tributary watersheds through independent proceedings.</p>

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		<p>The Water Board was provided with valuable guidance from at least two independent expert panels that provided reports describing the best available science, but their guidance was largely ignored in the Phase II Report. After the Water Board’s Water Quality Control Plan workshops in 2012, the Water Board asked the Independent Science Program to provide assistance in reviewing the significant technical information it received during the workshops. In response, the Independent Science Program organized and hosted at least two independent expert review panels: the Delta Outflow and Related Stressors (“Outflow Panel”), and the Interior Delta Flows and related Stressors (“Interior Flows Panel”).</p> <p>[Footnote 2: There have been other expert panels providing input regarding best scientific practices, and those reports provide similar guidance.] The Phase II Report ignores much of the recommendations and guidance provided by these independent expert panels, particularly with respect to disclosure of uncertainty and standard statistical practices.</p> <p>The independent peer review panels were significantly more qualified in their expectations regarding what could be achieved with new flow in the current Delta.</p>	