

**Table 4-1. Responses to Comments**

Ltr#	Cmt#	Comment	Response
1166	1	The SFPUC believes the State Water Board's revised SED analysis prepared in compliance with the California Environmental Quality Act is deficient. The City and County of San Francisco's City Attorney Office have prepared comments detailing these deficiencies. They are included as an attachment to this letter (Attachment 1). As identified in these comments, contrary to the State Board's analysis, a 40% unimpaired flow proposal would mean a significant impact on San Francisco's water supply, and alternatives to make up that supply are enormously expensive and have potential significant impacts that make their implementability uncertain.	Please see Master Response 1.1, General Comments, for information regarding the State Water Board's compliance with CEQA, and Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for responses to comments specific to San Francisco. Responses to Attachment 1 of this letter are provided in responses to comments 1166-6 through 1166-80.
1166	2	We have serious doubts about the Tuolumne River ecosystem benefits of the State Water Board's proposal. Over 200 studies have been performed on the Tuolumne River since the early 1990s and the SFPUC and Turlock and Modesto Irrigation Districts have spent \$25 million on studies on the Tuolumne River fishery in the last 5 years. The State Board neglected to use these site-specific available data. All of these studies provide significant information about the state of the fishery on the Tuolumne River and what should be done to improve the fishery.	Please see Master Response 3.1, Fish Protection, regarding the benefits of implementation of the plan amendments and the scientific basis, as well as the SED's use of the best available science. Despite the fisheries studies and restoration efforts on the Tuolumne River, salmon, steelhead, and other native fish populations have continued to decline to extremely low numbers. Salmon populations on the Tuolumne River have gone through the biggest decline compared to other rivers in the Central Valley between the 1967 to 1991 and 1992 to 2001 time periods (see Chapter 19, Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30). The plan amendments are designed to reverse the current trend of native fish declines and reasonable protect beneficial uses. The State Water Board considered studies that have been conducted on the Tuolumne River, including those related to the FERC relicensing process. State Water Board staff are engaged in that process due to the board's role in the Clean Water Act section 401 water quality certification process associated with relicensing. For example, the floodplain and weighted usable area (WUA) evaluations in Chapter 7, Aquatic Biological Resources, and Chapter 19 used information prepared during the FERC relicensing process. Additionally, see Master Response 3.1 regarding predation studies conducted during the FERC relicensing process.
1166	3	[SFPUC] cannot support a proposal that hurts our water supply while benefitting other users. Increased flow releases from the San Joaquin tributaries will increase Delta inflow. Increased Delta inflow could be used as the basis for increased diversions from the South Delta by the State Water Project and the Central Valley Project. Benefits for the Projects at the expense of San Francisco's water supply are not acceptable.	Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues. Please also see Master Response 1.1 regarding the purposes and goals of the plan amendments and Master Response 1.2, Water Quality Control Planning Process, 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.
1166	4	Negotiated settlements among water users, NGOs and the State and Federal agencies are a better solution than the State Water Board's regulatory proposal if they can be developed and implemented. They need to be jointly developed for the San Joaquin River, the Sacramento River and the Delta. The State-sponsored settlement discussions are off to a slow, but promising, start. There is much work to be done in building trust among the parties. However, we do not believe the State Water Board's regulatory proposal provides a framework that is sufficiently flexible or robust to support settlements.	Please see Master Response 1.1, General Comments, for a discussion of the voluntary agreements. Please refer to Master Response 2.1, Amendments to the Water Quality Control Plan, and Master Response 2.2, Adaptive Implementation, for a discussion of the plan amendments and the flexibility afforded under them.
1166	5	[ATT1: Detailed comments by City and County of San Francisco.]	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.
1166	6	[ATT1:ATT1: Table of Authorities cited by City and County of San Francisco.]	This attachment was included with the comment letter. The attachment does not make a general comment regarding the plan amendments or raise a significant environmental issue.
1166	7	[From ATT1:] San Francisco and the Districts incorporated the Raker Act's flow bypass requirements into the terms of the Fourth Agreement. In return for San Francisco paying over half of the capital costs for the new Don Pedro Dam, the Districts agreed not to require San Francisco to bypass flow to meet the Districts' water entitlements whenever San Francisco has a positive balance in the water bank account. If San Francisco's balance in the	This comment and other comments in Attachment 1 of the comment letter provide background information about the Fourth Agreement, the commenter's operations (including during the recent drought), and water supply planning methodology. Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant environmental issues. Refer to Master Response 8.5, Assessment of Potential Effects on the San Francisco

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		<p>water bank account goes to zero, the Fourth Agreement requires San Francisco to release or bypass sufficient water to satisfy the Districts' water entitlements at La Grange Dam. When releases from San Francisco's three reservoirs on the Tuolumne River and its tributaries exceed the Districts' water entitlements or the natural river flow, whichever is less, the excess water can be credited to San Francisco's water bank account, allowing the SFPUC to more flexibly store water in Hetch Hetchy Reservoir for delivery to its customers at other times of the year or over the course of successive dry years using carryover storage. [Footnote 5: See 2015 Urban Water Management Plan for the City and County of San Francisco, San Francisco Public Utilities Commission, June 2016 (referred to below as "SFPUC 2015 UWMP"), available at <a href="http://www.sfwater.org/modules/showdocument.aspx?documentid=9301">http://www.sfwater.org/modules/showdocument.aspx?documentid=9301</a>, at Appendix L, at 6.] Article 8 of the Fourth Agreement provides "[t]hat at any time Districts demonstrate that their water entitlements, as they are presently recognized by the parties, are being adversely affected by making water releases that are made to comply with Federal Power Commission license requirements, and that the Federal Power Commission has not relieved them of such burdens, City and Districts agree that there will be a re-allocation of storage credits so as to apportion such burdens on the following basis: 51.7121% to City and 48.2879% to Districts." The SED explains that "[b]y 2022, the State Water Board will fully implement the February through June LSJR flow objectives through water right actions or water quality actions, such as Federal Energy Regulatory Commission (FERC) hydropower licensing processes." (SED, at K-28.) Pursuant to Article 8 of the Fourth Agreement, revised water release requirements for the Don Pedro Hydroelectric Project ordered by FERC could result in San Francisco being responsible to bypass approximately 51.7 percent of the required flows. [Footnote 6: The analysis in these comments assumes a 51.7 percent flow contribution by San Francisco. As a water supply provider to approximately 2.6 million people throughout the Bay Area, San Francisco must utilize worst-case scenarios for water supply planning purposes. In presenting the potential water supply, environmental, and socioeconomic effects from certain interpretations of the Raker Act and the Fourth Agreement San Francisco does not waive arguments it may have about how the Raker Act or Fourth Agreement should or will be interpreted in future proceedings before the State Water Board, FERC, courts of competent jurisdiction, or in any other context.]</p>	<p>Bay Area Regional Water System, for information regarding the analysis of impacts to the SFPUC Regional Water System (RWS) service area due to potential water supply reductions resulting from implementation of the plan amendments.</p>
1166	8	<p>[From ATT1] San Francisco's Current Contractual Obligations Regarding Instream Flow Release Requirements at Don Pedro Dam. In 1994 FERC initiated mediation among 12 parties, including San Francisco and the Districts, on flow schedules and other matters related to instream flow releases from Don Pedro Dam in support of fisheries in the lower Tuolumne River. [Footnote 7: Water System Improvement Program Programmatic Environmental Impact Report ("WSIP PEIR" or "PEIR"), available at <a href="http://sf-planning.org/sfpuc-negative-declarations-eirs">http://sf-planning.org/sfpuc-negative-declarations-eirs</a>, at 2-42. San Francisco incorporates the WSIP PEIR by reference herein.] In February 1996, the Districts filed an uncontested settlement agreement with FERC that included minimum flow schedules that were greater than the previous flow schedules (1996 Settlement Agreement). [Footnote 8: Id.] In July 1996, FERC amended the Don Pedro Hydroelectric Project license to incorporate the flow schedules in the 1996 Settlement Agreement. [Footnote 9: Id.; see also Turlock Irrigation Dist. &amp; Modesto Irrigation Dist., Order Amending License and Dismissing Rehearing Requests (July 31, 1996) 76 FERC ¶ 61117 ("1996 FERC Decision"), at 61614; Submission by Turlock Irrigation District and Modesto Irrigation District of Settlement Agreement and Request for License Amendments</p>	<p>The 1996 Settlement Agreement referenced in the comment took place three years prior to the recognition of Central Valley fall-run as a species of concern. Since 2000, combined escapement of adult fall-run Chinook salmon for the three major San Joaquin tributaries has significantly declined. Data on such fishery declines and other more recent scientific information helped inform the State Water Board objective for the reasonable protection of fish and wildlife. Please see Appendix C, Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives. In addition, please see Master Response 1.1, General Comments, for general information regarding the scientific basis for the flow objectives and their development</p>

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		<p>Pursuant to Settlement Agreement, February 5, 1996 ("1996 Settlement Agreement"), attached hereto as Exhibit 1. It is not clear from the SED whether, or why, the fishery and water quality standards analyzed in the SED were not comprehensively addressed in the 1996 Settlement Agreement and the proceedings leading up to it, or how the new information developed since 1996 would inform the dramatically different flow schedule called for in the SED. ] Prior to execution of the 1996 Settlement Agreement, on April 21, 1995, San Francisco and the Districts entered into an agreement that required San Francisco to make annual payments to the Districts in return for the Districts meeting all the minimum flow requirements provided for in the 1996 Settlement Agreement ("1995 Side Agreement"). [Footnote 10: WSIP PEIR, supra note 7, at 2-42.] The 1996 Settlement Agreement extends through the remainder of the FERC license and any annual licenses issued for the project. [Footnote 11: Id. at 2-42—2-43.]</p>	
1166	9	<p>[From ATT1:] A draft SED must include "identification of any significant or potentially significant adverse environmental impacts of the proposed project;" "analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts;" and "environmental analysis of the reasonably foreseeable methods of compliance." (Cal. Code Regs., tit. 23, § 3777(b)(2-4) ); Cal. Code Regs., tit. 14, § 15187(b)-(c) ).) The environmental analysis of the reasonably foreseeable methods of compliance "shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites" at a program level. (Cal. Code Regs., tit. 23, § 3777(c).) The State Water Board must also comply with the requirements of Public Resources Code Section 21159, which provides an agency "shall perform, at the time of the adoption of a rule or regulation requiring . . . a performance standard . . . an environmental analysis of the reasonably foreseeable methods of compliance." (Pub. Res. Code, § 21159(a). ) The required environmental analysis must include: "[a]n analysis of the reasonably foreseeable environmental impacts of the methods of compliance;" "[a]n analysis of reasonably foreseeable feasible mitigation measures;" and, "[a]n analysis of reasonably foreseeable alternative means of compliance with the rule or regulation." (Pub. Res. Code, § 21159(a)(1-3) ).) Similar to the requirements prescribed by California Code of Regulations, Title 23, Section 3777 identified above, the environmental analysis of the reasonably foreseeable methods of compliance required by the statute must "take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites" at a program level. (Pub. Res. Code, § 21159(c-d) ).)</p>	<p>This comment provides background information regarding CEQA compliance. Please see Master Response 1.1, General Comments, for information regarding the State Water Board's approach to the analyses and compliance with CEQA.</p>
1166	10	<p>[From ATT1:] The SED Must Analyze the Environmental and Economic Impacts of the Most Reasonably Foreseeable Method of Compliance by San Francisco: Reductions in Deliveries throughout the RWS [Regional Water System] service territory for the current and projected population through 2040. As San Francisco has previously explained to the State Water Board, reduction in water deliveries throughout the RWS service territory is San Francisco's most reasonably foreseeable method of compliance with the implementation of a new unimpaired flow objective on the Tuolumne River. [Footnote 21: 2013 CCSF Comment Letter, supra note 3, at 6-7 (citation omitted) [wherein San Francisco explains that if it were required, pursuant to the Fourth Agreement, to bypass flow to meet a 35-percent unimpaired flow objective on the Tuolumne River, "[a]ssuming current demands and a recurrence of the 1987-1992 drought, the SFPUC's annual diversions from the Tuolumne River could be reduced by 111,7000 AF for each of the six years of the drought. This additional reduction in supply--when added to reductions in deliveries of up to 20% already imposed by the SFPUC to ensure delivery of water to customers throughout the 1987-1992</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources of water, such as through water transfers. This comment and other comments in Attachment 1 of the comment letter provide background information about the Fourth Agreement, the commenter's operations (including during the recent drought), and water supply planning methodology. Please see Master Response 1.1, General Comments, for responses to comments that either make a general comment regarding the plan amendments or do not raise significant</p>

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		<p>drought--results in a single year of reduction in deliveries of 42%, and five years of reduction in deliveries of 52%.".) See also Letter to Mark Gowdy, Division of Water Rights, State Water Resources Control Board, from Jonathan Knapp, Deputy City Attorney, San Francisco City Attorney's Office, July 29, 2014 [ATT12], at 2 ("The Phase 1 SED must analyze the impacts of reduction in deliveries throughout the RWS service territory that may result from implementation of the proposed Tuolumne River flow alternatives because reduction in deliveries is the only method of compliance that is within the SFPUC's control, and thus, it is the reasonably foreseeable consequence of the State Water Board's contemplated action.".)]The SED concedes that estimated "regional impacts" would be substantially greater if implementation of a new unimpaired flow objective on the Tuolumne River resulted in reduced deliveries throughout the RWS service territory than if, as the draft assumes, San Francisco could simply purchase the requisite volume of replacement water supply from the Districts. (SED, at 20-40 ["It is assumed that SFPUC would purchase and transfer additional water supplies from the Tuolumne River Watershed to offset water shortages during drought periods. This would result in substantially lower estimates of regional impacts than if it is assumed that SFPUC would cut back its water deliveries (i.e., impose shortages) to its retail and wholesale customers, particularly in assessing impacts for commercial and industrial water users. See Sunding 2014 for an assessment of how assumed water shortages, as opposed to the water replacement approach used in this analysis, within the Hetch Hetchy Regional Water System Service Area could impact SFPUC."].) [Footnote 22: Given that, San Francisco has previously informed the State Water Board that its reasonably foreseeable method of compliance would be reductions in deliveries throughout the RWS service territory, which is the only option entirely within San Francisco's control, the State Water Board cannot claim that reduction in deliveries is an "as-yet unknown method of compliance." (SED, at 13-58 (emphasis) ["Service providers may choose any method of compliance described in Chapter 16, or a combination of methods, or they may identify another as yet unknown method of compliance to comply with requirements from the revised objectives."].)]However, despite the State Water Board's own recognition that reduced deliveries would result in substantially greater impacts throughout the Bay Area, the draft analysis fails to identify reduction in water deliveries throughout the RWS service territory as a reasonably foreseeable method of compliance by San Francisco, let alone analyze the environmental and economic impacts associated with such shortages. [Footnote 23: See Bay-Delta Phase 1 Staff Technical Workshop of December 12, 2016, Transcript of Video Recording, Exhibit 5 [ATT13], at 211:23-25--212:1-3 (wherein Les Grober, Assistant Deputy Director of Division of Water Rights, acknowledges that the Draft 2016 fails to "consider the effects of additional water supply rationing by the [SFPUC] system in response to contributions to the instream flows," but refuses to explain the basis for the omission).]This glaring omission contravenes the State Water Board's statutory obligation to "carefully evaluate the recommendations of concerned . . . local agencies" "[d]uring the process of formulating or revising state policy for water quality control" [Footnote 24: See Bay-Delta Phase 1 Staff Technical Workshop of December 12, 2016, Transcript of Video Recording, Exhibit 5 [ATT13] at 211:23-25--212:1-3 (wherein Les Grober, Assistant Deputy Director of Division of Water Rights, acknowledges that the Draft 2016 fails to "consider the effects of additional water supply rationing by the [SFPUC] system in response to contributions to the instream flows," but refuses to explain the basis for the omission).] and violates the substantive standards of CEQA, the requirements of the certified regulatory program associated with the State Water Board's water quality control program, and the Porter-Cologne Act.</p>	<p>environmental issues. In addition, please see Master Response 1.2, Water Quality Control Planning Process, regarding economic considerations as part of the SED's analyses.</p>

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1166	11	<p>[From ATT1:] The SFPUC currently faces water supply shortages in sequential-year droughts and hardened water supply demands throughout the RWS [Regional Water System] service territory, as compared to prior drought periods. Without consideration of the potential implementation of a new unimpaired flow objective on the Tuolumne River, the SFPUC already faces water supply shortages that require customer rationing during sequential-year droughts. "The SFPUC currently operates under a plan that anticipates multiple stages of response to water supply shortages, ranging from use of dry year water supplies (when available) and voluntary customer water reductions to enforced rationing." (SFPUC 2015 UWMP, at 7-3.) Water demand in a single dry year would initially be satisfied with water deliveries from storage and use of available dry year supplies. (Id.) As total system storage declines, however, it would be necessary for the SFPUC to impose mandatory rationing. (Id.) Although implementation of the WSIP will improve the SFPUC's water supply reliability [Footnote 25: See WSIP PEIR, at 3-37 ("In drought years, the SFPUC would implement a multistep drought response program. Under this program, the initial response to a drought would be to initiate the extraction component of the [groundwater conjunctive-use program in the Westside Groundwater Basin in northern San Mateo County] and to continue to fully deliver customer purchase requests during the initial response stage. If drought conditions were to persist, the groundwater extraction would be augmented with the [proposed 2 mgd water transfer with the Districts], which might be sufficient to defer any additional response actions. If necessary, in combination with the supplemental water supplies and within the WSIP goals for drought periods, the SFPUC would then implement up to 20 percent systemwide rationing.".)], particularly in the earlier years of a sequential-year drought, "in extended drought periods, the SFPUC will continue to experience multiple years of 10 to 20% rationing." (SFPUC 2015 UWMP, at 7-3.) [Footnote 26: "The SFPUC uses a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the 'design drought' and serves as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record which include the 1976-77 drought. While the current drought (2012 through 2015, and potentially ongoing) consists of some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit." (2015 SFPUC UWMP, at 7-2.) Footnote 26, cont. Although the SFPUC relies on the design drought as part of its water supply planning methodology, the water supply shortages depicted in these comments are based on simulations of the historical hydrology from 1921 through 2011. See Declaration of Matt Moses in Support of Comments by the City and County of San Francisco to the Draft Substitute Environmental Document in Support of Potential Changes to the Bay-Delta Plan ("Moses Decl."), attached hereto as Appendix 2 [ATT4], see Attachment 1 to the Moses Decl. [ATT4:ATT1], SFPUC Analysis of Proposed Changes to Tuolumne River Flow Criteria, March 14, 2017, at 3 (explaining that "[w]hile the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate the system performance in the historical record.".)]. In fact, the 2040 WaterMAP predicts a 5.3 mgd deficit in 2040 in drought years with 10 percent rationing in all years. (WaterMAP, at 24.) This is an approximately 2 percent forecasted shortfall. (Id.) Were San Francisco required to bypass flows in compliance with an unimpaired flow objective on the Tuolumne River, such water supply reductions would exponentially increase the water supply shortages already experienced by the RWS service territory during protracted droughts.</p>	Please see response to comment 1166-10.

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1166	12	<p>[From ATT1:] Because water use within San Francisco, i.e., in-City retail service, continues to be among the lowest in the State and below historic consumption levels, (SFPUC 2015 UWMP, at 4-2), San Francisco's current demand "is likely hardened" as compared to historic levels, e.g., the level of demand in 1987 at the beginning of the 1987-1992 drought period, (SFPUC 2015 UWMP, Appendix K, at 3). (See also SFPUC 2015 UWMP, Appendix L, at 5 ["t]he SFPUC retail customers are facing a hardened demand as a result of long-term conservation programs and installation of water-conserving devices during the 1987-92 drought."); SFPUC 2015 UWMP, Appendix K, at 3 [explaining that the conservation measures implemented by San Francisco's retail and wholesale customers during the 1987-1992 drought "have led to permanent per capita water usage savings."].) Both per capita usage, i.e., gallons of water consumed per person per day ("GPCD"), and total consumption have declined since the mid-1970s. (SFPUC 2015 UWMP, at 4-2.) "Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Franciscans. In particular, the severe droughts of 1976-77 and 1987-92, changes in plumbing codes, and conservation programs (either voluntarily embraced by residents and businesses or mandated by the City), have affected water demands." (Id.) In FY 2015-2016, per capita water use by in-City retail customers within the residential sector is 44 GPCD, and per capital water use by all sectors is 77 GPCD. (Id.) This reduction in water use makes it more difficult to achieve a significant, i.e., 25 percent or greater, reduction in water use as compared to the water savings that were attained during the 1987-1992 drought. (SFPUC 2015 UWMP, Appendix K, at 4; see also SFPUC 2015 UWMP, Appendix L, at 5 ["t]his hardened demand means that reducing demand during future droughts will be challenging.".) Similarly, "[a]verage residential per capita consumption (excluding Stanford) in the BAWSCA service area was 64.7 [GPCD] in FY 2014-15," and the average gross per capita consumption in FY 2014-15 was 105.7 GPCD. [Footnote 27: BAWSCA 2015 Annual Survey, supra note 2, at ES-9 (explaining that due to "its unique service area, residential per capita consumption for Stanford is excluded.".)] By comparison, at the peak in FY 1986-87, gross per capita consumption in the areas served by the SFPUC's wholesale customers was 186.5 GPCD. [Footnote 28: Id.] The low residential use by retail and wholesale customers in the RWS service territory is far below statewide average residential use for November 2016 of 76.6 GPCD. [Footnote 29: Fact Sheet, November 2016 Statewide Conservation Date, available at <a href="http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2017jan/fs010417_nov_conser%20vation.pdf">http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2017jan/fs010417_nov_conser vation.pdf</a>, attached hereto as Exhibit 6 [ATT14], at 5 (unnumbered).] Obtaining further reductions in demand by RWS customers will present new and distinct challenges.</p>	Please see response to comment 1166-10.
1166	13	<p>[From ATT1:] Implementation of LSJR Alternatives 3 or 4 would exponentially increase existing water shortages in the RWS service territory during sequential-year droughts. Although the SED recognizes that if San Francisco were obligated to contribute 51.7 percent of the instream flow required by a new unimpaired flow objective on the Tuolumne River (above the current minimum instream flow requirements prescribed by the Districts' FERC license for the Don Pedro Hydroelectric Project), it could face significant water supply reductions, the draft underestimates the deficit that San Francisco would experience. The SED estimates that, assuming a reoccurrence of 1987-1992 hydrology, the largest potential water supply reduction San Francisco could experience if the State Water Board implemented a 40 percent unimpaired flow objective on the Tuolumne River (LSJR Alternative 3) would be 119,000 AF/year for each year of a 6-year drought. (SED, Appendix L, at L-21, Table L.4-2.) However, the water supply reduction that San Francisco would</p>	Please see response to comment 1166-10.

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		<p>actually suffer in this scenario is even more severe. Under a 40 percent unimpaired flow objective, San Francisco's water supply would be reduced by 129,884 AF/year for each of the 6 years, resulting in a loss of an additional 10,884 AF/year, or 65,304 AF in total for the 6-year period. [Footnote 30: See SFPUC Analysis of Changes to Flow Criteria, supra note 26, at 16, Table 9.] Using the same assumptions, the SED also estimates that if the State Water Board implemented a 60 percent unimpaired flow objective on the Tuolumne River the greatest potential reduction in water supply that San Francisco could experience would be 208,000 AF/year for each of the 6 years, or 1,248,000 AF in total for the 6-year drought period. By comparison, the maximum capacity of the SFPUC's storage facilities on the Tuolumne River, i.e., Hetch Hetchy Reservoir (360,400 AF), Lake Eleanor (27,100 AF), Cherry Reservoir (273,300 AF), including consideration of the operational flexibility provided by the SFPUC's water bank in Don Pedro Reservoir (570,000 AF), is 1,230,800 AF. As explained, San Francisco relies upon its carryover storage as its primary source of water supply for delivery to the RWS service territory during sequential-year droughts. The required flow volume would consume all of the water available from the SFPUC's Tuolumne River storage facilities. This scenario is utterly detached from the reality of the SFPUC's operations on the Tuolumne River. Thus, San Francisco has not separately analyzed whether the SED's estimate of San Francisco's water supply reductions under a 60 percent unimpaired flow objective would, in fact, be even more severe.</p>	
1166	14	<p>[From ATT1:] It is reasonable to assume that San Francisco would require increased levels of rationing if LSJR Alternatives 3 or 4 were implemented and a sequential-year drought occurred based on San Francisco's drought planning policies, and the history of its actions during past droughts. San Francisco imposed water rationing of up to 45 percent during the 1987-1992 drought. "The 1987-92 [six-year] drought provides an example of how the near-term drought management process works in times when the operational capabilities of Hetch Hetchy and other water supplies available to the SFPUC are taxed to a point that forces drastic actions to avoid running out of water." (SFPUC 2015 UWMP, Appendix K, at 1.) The sequential-year drought "forced San Francisco to adopt a mandatory rationing program, enforced by stiff excess use charges and the threat of shut-off for continued violations of water use prohibitions." (Id.) The rationing program was in effect from May 1988 through May 1989, and was then reinstated in May 1990 and continued until March 1993. (Id.) On April 28, 1988, the SFPUC passed a "Water Shortage Emergency Resolution," Resolution No. 88-0155, that declared these rationing periods and the existence of a water shortage emergency pursuant to Water Code Sections 350, et seq. (Id. at 1, 6.) The resolution also provided authorization for the SFPUC's General Manager to interrupt water service to San Jose and Santa Clara. (Id. at 6.) "The SFPUC's water rationing program was one of the toughest in the state and the most stringent imposed by any urban water supply agency. Although the specifics of the program varied over time, the basic outline of the mandatory rationing program was to achieve a 25 percent reduction to 1987 (pre-drought) consumption (system-wide), with water allocations set on an account-by-account basis." (Id. at 1.)</p>	Please see response to comment 1166-10.
1166	15	<p>[From ATT1:] In early 1991, the Hetch Hetchy Reservoir became so depleted (less than 25,000 AF of storage in a reservoir with over 360,000 AF of capacity) that minimum instream flow releases and anticipated demands required the SFPUC to initiate programs to achieve a 45 percent reduction in system-wide water deliveries. (SFPUC 2015 UWMP, at 8-1.) The 45 percent reduction was to be achieved through a 33 percent reduction in indoor water use and a 90 percent reduction in outdoor water use. (SFPUC 2015 UWMP, Appendix K, at 4.) "Public and commercial response to 45 percent rationing was overwhelmingly</p>	Please see response to comment 1166-10.

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		<p>negative. . . . Simply put, rationing had been taken to a level that was considered intolerable to citizens and had become economically disastrous." (Id. at 5; see also Affidavit of Anson B. Moran ("Moran Affidavit"), FERC Project No. 2299, January 26, 1994, attached hereto as Exhibit 7 [ATT15], at ¶ 8 [explaining that the 45 percent level of rationing initiated in 1991 "was found to be intolerable and not achievable."].) The SFPUC's mandatory rationing program ultimately reduced demand by approximately 30 percent as compared to pre-drought deliveries. [Footnote 31: Although the initial system-wide goal of reducing water use by 25 percent--as compared to pre-drought conditions, i.e., calendar year 1987 water deliveries--was achieved during the 1987-1992 drought, as noted, the ability of SFPUC's retail customers to achieve a 25 percent reduction in the future "is highly unlikely due to the 'hardening' of water demands that occurred during and subsequent to the drought." (SFPUC 2015 UWMP, supra note 5, Appendix K, at 3.) "Thus, it would be more difficult to achieve a 25-percent reduction in water use since the 1987-1992 drought, and, specifically, would require additional measures beyond those implemented during the 1987-1992 drought to achieve a comparable level of water use reduction." (Id. at 4.)] (Moran Affidavit, at ¶ 9.) San Francisco also purchased water from other entities. (Id.) "These actions along with a fortuitous storm during the spring of 1991 allowed the City to regain control of its system and efforts moved forward to better plan for the reliability of the City's water deliveries." (Id.)</p>	
1166	16	<p>[From ATT1:] During the recent drought the SFPUC took progressively more aggressive steps to reduce water use, including: mandatory reduction of all water use by San Francisco city departments; mandatory reduction of outdoor irrigation by customers; a call for voluntary reduction of indoor use by customers; and, other water use restrictions. On January 31, 2014, the SFPUC asked for voluntary 10 percent system-wide rationing. (SFPUC 2015 UWMP, Appendix F, at 2.) On February 10, 2014, the Mayor directed City departments to reduce water consumption by 10 percent. (Id. [citing Executive Directive 14-01].) On August 12, 2014, in response to State Water Board emergency regulations, the SFPUC imposed a mandatory 10 percent reduction on outdoor irrigation. (Id. [citing Resolution 14- 0121].) On August 26, 2014, SFPUC adopted regulations and restrictions for administering water use allocations and excess use charges on irrigation customers. (Id. [citing Resolution 14-0140].) On April 28, 2015, the SFPUC imposed additional water use restrictions consistent with State Water Board emergency regulations. (Id. [citing Resolution 15-0119].) On June 23, 2015, the SFPUC amended rules and regulations for interruptible water service. (Id. [citing Resolution 15-0149].) The SFPUC was not compelled to declare a water shortage emergency pursuant to Water Code Section 350 during the recent drought, and, subsequently, to impose mandatory system-wide rationing and shortage allocations, because its customers exceeded the 10 percent voluntary system-wide reduction in conjunction with the Statewide mandatory reductions assigned by the State Water Board. (SFPUC 2015 UWMP, at 8-2.) It appears that the current drought is now over. However, in future droughts, if the SFPUC determined that mandatory system-wide rationing needed to be imposed, then it would issue a declaration of a water shortage emergency under Water Code Sections 350 "and implement rationing in accordance with the WSA and Water Shortage Allocation Plan (WSAP)." SFPUC 2015 UWMP, at 8-2.)</p>	Please see response to comment 1166-10.
1166	17	<p>[From ATT1:] Implementation of LSJR Alternatives 3 or 4 would require San Francisco to impose unsustainable levels of mandatory rationing during sequential-year droughts. [Footnote 32: Although the SED contemplates flow shifting, carryover storage requirements, and other possible adaptive management adjustments of the unimpaired flow standard, the draft does not describe the application of these elements in sufficient detail for San</p>	Please see response to comment 1166-10.



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		<p>Francisco to include in its modeling analysis of potential water supply shortages to the RWS [Regional Water System] service territory. Further, the effect of any potential carryover storage requirement associated with Don Pedro Reservoir on the SFPUC's operations is unclear. These additional adjustments of the unimpaired flow standard may have the effect of further reducing the amount of water that the SFPUC is able to divert from the Tuolumne River, and thereby increasing water supply shortages experienced by the RWS service territory. See SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1], supra note 26, at 2, 7.] If the State Water Board implemented LSJR Alternatives 3 or 4 and San Francisco were obligated to bypass 51.7 percent of the required flow on the Tuolumne River, San Francisco would experience severe water shortages during sequential-year droughts that would, in turn, require the SFPUC to significantly reduce deliveries to the RWS service territory. For example, assuming 1987-1992 hydrology and maximum SFPUC contract deliveries of 265 mgd, the additional reduction in water supply San Francisco would experience under a 40 percent unimpaired flow objective on the Tuolumne River, i.e., 129,884 AF/year for each of the 6 years, would result in a 40 percent reduction in deliveries for the first year of the drought, and a 54 percent reduction in deliveries in each of the subsequent 5 years. [Footnote 33: Id. at 16, Table 9 (showing SFPUC's average annual contribution from compliance with a 40 unimpaired flow objective on the Tuolumne River, assuming 1987-1992 hydrology and using a simulated demand of 264 mgd, as 129,884 AF/year); id. at 10, Table 2 (showing correlative reductions in water deliveries across the RWS service territory).] Further, using the same assumptions and level of demand, under a 50 percent unimpaired flow objective the SFPUC would need to reduce deliveries to the RWS service territory by a staggering 69 percent in each of the 6 years of the drought. [Footnote 34: Id. at 10, Table 2.] When lower annual system deliveries are used, the results are similarly jarring. For example, using the same underlying assumptions, as described above, and annual deliveries of 223 mgd, which is equivalent to FY 2012-2013 pre-drought demand, if a 40 percent unimpaired flow objective were implemented on the Tuolumne River the SFPUC would be compelled to reduce deliveries to the RWS service territory by 39 percent during the first 3 years of the drought, and then tighten its belt further, by imposing 49 percent reductions in deliveries for the next 3 years. [Footnote 35: Id. at 11, Table 3.] Using the same assumptions and level of demand, implementation of a 50 percent unimpaired flow objective on the Tuolumne River would require the SFPUC to reduce its deliveries by an unattainable 62 percent in each of the 6 years of the drought. [Footnote 36: Id.] Even using the level of reduced deliveries achieved by the SFPUC and its customers throughout the RWS service territory during the recent drought in FY 2015-2016 of 175 mgd--that represents a reduction in San Francisco's pre-drought deliveries of 223 mgd by over 20 percent--high levels of rationing are still required. Using the same set of assumptions, if the State Water Board implemented a 40 percent unimpaired flow objective on the Tuolumne River, the SFPUC would need to reduce deliveries by a further 20 percent during the first 3 years of the drought, and then impose 32 percent reductions in the next 3 years. [Footnote 37: Id. at 12, Table 4.] In this scenario, the State Water Board's implementation of a 50 percent unimpaired flow objective would require the SFPUC to reduce its deliveries by 39 percent in the first 3 years of the drought, and by 62 percent in the next 3 years. [Footnote 38: Id.]</p>	
1166	18	<p>[From ATT1:] Implementation of LSJR Alternatives 3 or 4 may jeopardize current deliveries from the RWS to San Jose and Santa Clara and constrain the SFPUC's ability to provide these cities with permanent supply guarantees. It is reasonable to assume that if LSJR Alternatives 3 or 4 were implemented, and San Francisco was responsible for bypassing 51.7 percent of the required flow on the Tuolumne River, that the SFPUC would be compelled to deny the</p>	<p>Please see response to comment 1166-10. San Jose and Santa Clara have been interruptible wholesale customers of SFPUC for at least three decades (see 1984 Settlement Agreement and Master Water Sales Contract, and 2009 Water Supply Agreement). In 2008, requests by the cities of San Jose and Santa Clara to become permanent SFPUC customers were deferred by SFPUC (BAWSCA 2016). As noted in SFPUC's planning documents, SFPUC has planned on continuing to supply water to these cities on a temporary,</p>

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		<p>request by San Jose and Santa Clara for permanent individual supply guarantees, and, during sequential-year droughts, might also need to interrupt water service to both cities. The cities of San Jose and Santa Clara do not have an allocated share of the Supply Assurance due to their temporary, interruptible status under the 1984 Agreement and the WSA. (SFPUC 2015 UWMP, at 4-9.) This is not an abstract consideration: in 1988, in the early stages of the 1987-1992 drought, the SFPUC passed a "Water Shortage Emergency Resolution," that, among other things, authorized the SFPUC's General Manager to interrupt water service to San Jose and Santa Clara. (SFPUC 2015 UWMP, Appendix K, at 6.) Further, the severe water supply reductions to the RWS that could result from implementation of LSJR Alternatives 3 or 4 would necessarily have to be taken into consideration by the SFPUC before reaching a decision regarding whether the SFPUC should provide permanent individual supply guarantees totaling 14.5 mgd to the cities of San Jose and Santa Clara.</p>	<p>interruptible basis pending a decision pursuant to Section 4.05A of the Water Supply Agreement, and to date SFPUC has not interrupted or reduced supplies to San Jose or Santa Clara . The decision to grant permanent customer status to San Jose and Santa Clara may be based on many factors (discussed in the SFPUC 2040 WaterMap [SFPUC 2016]) including those that have transpired over three decades, and would likely consider the entire water supply and demand planning portfolio of SFPUC in order to determine if long-term water supplies are available. These considerations are likely to exist regardless of whether the plan amendments are adopted. Although implementation of the plan amendments potentially may reduce surface water supplies in sequential dry years, past history indicates that other factors primarily affect SFPUC's decision of whether or not to grant permanent supply guarantees.</p>
1166	19	<p>[From ATT1:] It is reasonable to assume that San Francisco's wholesale customers would require increased levels of rationing if LSJR Alternatives 3 or 4 were implemented and a sequential-year drought occurred based on these customers' drought planning policies. For example, the Water Shortage Contingency Plan for the Westborough Water District ("WWD") states that in response to a water supply reduction of up to 20 percent, the district will implement a water budget program to ensure "[w]ater use shall not exceed water allocations established by WWD for each customer." [Footnote 39: 2015 Urban Water Management Plan for the Westborough Water District, Public Review Draft, May 2016, available at <a href="http://www.westboroughwater.com/Documents/Public%20Draft%20WWD%20UWMP_2016-05-23.pdf">http://www.westboroughwater.com/Documents/Public%20Draft%20WWD%20UWMP_2016-05-23.pdf</a>, at 63 (explaining that in response to a "Stage 3" reduction in water supply WWD will ensure that "[w]ater use shall not exceed water allocations established by WWD for each customer;" id. at 59, Table 7-2--Stages of Water Shortage Contingency Plan (DWR Table 8-1) (defining "Stage 3" as up to a 20 percent water supply reduction).] Similarly, the Water Shortage Contingency Plan for the San Jose Municipal Water System provides that the City will implement an "[e]nforceable mandatory water budget program" if water deliveries from its wholesale supplier, i.e., the SFPUC, are reduced by more than 50 percent. [Footnote 40: 2015 Urban Water Management Plan for the San Jose Municipal Water System, June 2016, available at <a href="https://www.sanjoseca.gov/DocumentCenter/View/57483">https://www.sanjoseca.gov/DocumentCenter/View/57483</a>, at 8-5.] Further, as explained in the Water Shortage Contingency Plan for the Alameda County Water District ("ACWD"), the District is authorized to adopt a base consumption allowance for each class of customers and establish use charges in response to water supply reductions of 20 to 30-percent. [Footnote 41: Alameda County Water District, Urban Water Management Plan 2015-2020, available at <a href="http://www.acwd.org/DocumentCenter/View/1264">http://www.acwd.org/DocumentCenter/View/1264</a>, at 10-8, Table 10-3c (explaining that in response to a "Stage 3" reduction in water supply, defined as a reduction of 20 to 30 percent, the District will "[i]mplement all actions in Stage 1 and 2 plus some or all of the following, as necessary to meet the District's reduction target . . . Adopt Base Consumption Allowance for each customer class and establish use charges. . .").]</p>	<p>Please see response to comments 1166-7 and 1166-10.</p>
1166	20	<p>[From ATT1:] Increased rationing by San Francisco throughout the RWS [Regional Water System] service territory would result in severe economic impacts to San Francisco and its retail and wholesale customers throughout the Bay Area that the State Water Board must analyze. Pursuant to the certified regulatory program for the State Water Board's water quality control planning program and Water Code Section 13241(d), the State Water Board is required to analyze the economic impacts of reasonably foreseeable methods of compliance with the proposed unimpaired flow objective on the Tuolumne River, including</p>	<p>Please see response to comment 1166-10.</p>

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		<p>San Francisco’s reduction of water deliveries to the RWS service territory. (Cal. Code Regs., tit. 23, § 3777(c) ); Cal. Code Regs., tit. 14, § 15187(d) ); Pub. Res. Code § 21159(c); Wat. Code, § 13241(d); Attwater Memo, supra note 21, at 4). [Footnote 42: See David Sunding, David Zilberman, Consideration of Economics Under California’s Porter-Cologne Act (2007) 13 Hastings W.-N.W. J. Envtl. L. &amp; Pol’y 73, at *76. (“A requirement to ‘consider economics’ is not the same as a directive to adopt only those regulations that pass a cost-benefit test. Agencies can use the results of economic analysis, but not be bound by ‘bottom-line’ numbers. Most economists would hesitate to argue that quantified costs and benefits tell the whole story, or that precise measurements of either are possible. But when economic analysis reveals low or non-existent benefits and high costs, something is likely amiss. It would seem that the California legislature sought to avoid such a socially undesirable outcome by mandating a consideration of economics when making water quality regulation.”)] However, the SED completely fails to analyze the economic impacts that would result from reduced water deliveries throughout the RWS service territory.</p>	
1166	21	<p>[From ATT1:] San Francisco’s 2014 Draft Socioeconomic Study is not incorporated by reference in the SED. As a preliminary matter, to the extent that the State Water Board may believe that two passing references to the analysis of economic impacts of water supply shortages in the RWS service territory presented in Socioeconomic Impacts of Water Shortages within the Hetch Hetchy Regional Water System Service Area, Draft Report, March 13, 2014 "2014 Draft Socioeconomic Study") serve to incorporate that analysis, and thus satisfy the agency’s obligation to consider the economic impacts of reductions in deliveries throughout the RWS service territory, the State Water Board is mistaken. (See SED, at L-26) ["It is reasonable to assume that SFPUC would purchase and transfer additional water supplies from the Tuolumne River Watershed to its service area to offset water shortages during drought periods. Such purchases would be expected to result in substantially lower estimates of regional impacts than if SFPUC would cut back its water deliveries (i.e., impose 42 shortages) to its retail and wholesale customers, particularly for impacts related to commercial and industrial water users. See Sunding 2014 for an assessment of impacts on SFPUC due to assumed imposition of water shortages, as opposed to the water replacement approach used in this analysis, within the Hetch Hetchy Regional Water System Service Area."]; id. at 20-40 [same].) These passing references simply represent the acknowledgement of an alternative view; these statements do not even purport to incorporate the referenced analysis into the SED, nor does the draft rely on the 2014 Draft Socioeconomic Study as a basis for the analysis of potential economic impacts to San Francisco. [Footnote 43: Cal. Code Regs., tit. 14, § 15150(f) (noting that "[i]ncorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand.")]. By contrast, the 2014 Draft Socioeconomic Study presents an alternative view of how water supply reductions would impact the RWS service territory, i.e., by resulting in reduced deliveries, that unquestionably "contribute[s] directly to the analysis of the problem at hand," and thus, this reasonably foreseeable method of compliance, and the consequent environmental and economic impacts, should have been substantively addressed in the SED.]Further, even if the 2014 Draft Socioeconomic Study had been properly incorporated by reference into the SED, the failure to respond--in any substantive way--to the 2014 Draft Socioeconomic Study would, nevertheless, render the analysis inadequate. (See e.g., Santa Clarita Organization for Planning the Environment v. County of Los Angeles (2003) 106 Cal.App.4th 715, 723 (citing Cleary v. County of Stanislaus (1981) 118 Cal.App.3d 348, 357 explaining that "[i]t is not enough for the EIR simply to contain information submitted by the public and experts. Problems raised by the public and</p>	<p>Please see response to comment 1166-10. In addition, please refer to Master Response 1.1, General Comments, regarding the approach to analyses and substantial evidence standard.</p>

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		responsible experts require a good faith reasoned analysis in response. The requirement of a detailed analysis in response ensures that stubborn problems or serious criticism are not 'swept under the rug.'")	
1166	22	<p>[From ATT1:] Increased rationing by San Francisco and throughout the RWS service territory would result in severe economic impacts to San Francisco and its retail and wholesale customers throughout the Bay Area. In general, assuming a pre-drought level of water supply demand, within the RWS service territory, the first 20 to 30-percent of water supply reductions can be borne by the residential sector and dedicated irrigation alone. These economic losses are experienced as welfare losses by the consumer, and manifest as consumers not being able to receive the water supply reliability that they have paid for through their water rates. Over time, these welfare losses result in dissatisfaction by customers with their respective local water providers and City Councils because they are paying for something--water supply reliability--that they are not receiving. Further, the reduced utility revenues result in increased utility rates or deferred capital projects, which may also result in the consumers receiving a reduced level of service. [Footnote 44: See e.g., Budget Workshop Presentation, Board Meeting, Alameda County Water District, May 26, 2016, attached hereto as Exhibit 8 [ATT16], at 14-25 (explaining that during the recent drought Alameda County Water District ("ACWD") implemented a plan to cut and/or defer spending on ACWD's Capital Improvement Program, that included, depending on the level of water shortage, reduction in spending on water line replacements and deferral of spending on seismic improvements to Alameda and Decosto Reservoirs.) See also "Millbrae Residents Learn About Risks of 60 Year Water System," Public, January 30, 2017, available at <a href="http://www.publicnow.com/view/9CC49AE443AED66936959C0EF03AA66E807B1EC2">http://www.publicnow.com/view/9CC49AE443AED66936959C0EF03AA66E807B1EC2</a>, attached hereto as Exhibit 9 [ATT17] (presenting an example of risks borne by deferring permanent main replacements: "Millbrae's water system was primarily built in the 1950's and 1960's. Deficiencies in the system became apparent in 2013 when seven water mains broke at the same time, causing thousands of Millbrae residents to temporarily go without water until public works crews were able to repair the broken pipes.") Reduced utility revenues may also result in depleted utility financial reserves, e.g., depletion of utility balancing accounts, which would likely necessitate future rate increases. Additionally, as indicated in the Moody Rating Report for the new SFPUC Water Bond, "[s]ustained deterioration of stored water supply" could negatively affect bond ratings, which would increase the cost of financing for capital projects, and, consequently, require further rate increases to cover higher interest rate payments. [Footnote 45: Moody's Investor Service, Credit Opinion, September 27, 2016, San Francisco Public Utilities Commission, Water Enterprise, New Issue--Moody's assigns Aa3 to San Francisco Public Utilities Commission (CA) Water Revenue Bonds Rating Report for SFPUC Bond, available at <a href="https://www.moody.com/research/Moodyassigns-Aa3-to-San-Francisco-Public-Utilities-Commission-CA-PR_903622289">https://www.moody.com/research/Moodyassigns-Aa3-to-San-Francisco-Public-Utilities-Commission-CA-PR_903622289</a>, attached hereto as Exhibit 10 [ATT18], at 2 (identifying the factors that could lead to a downgrade in the SFPUC's bond rating as "[m]aterial weakening of debt service coverage," "[s]ignificant diminishment of liquidity," or "[s]ustained deterioration of stored water supply.")]</p>	Please see response to comment 1166-10.
1166	23	<p>[From ATT1:] Significantly, once water supply reductions in the RWS [Regional Water System] service territory reach a level that can no longer be borne by the residential sector alone a "tipping point" occurs. "Tipping point" is defined by the Merriam-Webster Dictionary as "the critical point in a situation, process, or system beyond which a significant and often unstoppable effect or change takes place." The threshold at which water supply reductions can no longer be solely absorbed by the residential sector--a point that will</p>	Please see response to comment 1166-10.

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		<p>necessarily vary depending on the alternative water supplies available to each agency in the RWS service territory--represents a critical juncture. Further water supply reductions past this tipping point require water rationing by the commercial and industrial ("C&amp;I") sectors that, in turn, manifest in the form of reduced economic output and job losses.</p>	
1166	24	<p>[From ATT1:] If the State Water Board implemented a 30, 40, or 50-percent unimpaired flow objective on the Tuolumne River, and San Francisco was responsible for bypassing 51.7-percent of the requisite flow, San Francisco would experience severe water shortages during sequential-year droughts that would require the SFPUC to significantly reduce deliveries to the RWS service territory. The magnitude of these water supply reductions would be too severe for the residential sector to bear alone, and thus, the commercial and industrial sectors would be directly affected. The resulting loss in jobs and economic output across the Bay Area would be staggering. For example, assuming maximum contract deliveries of 265 mgd, and a reoccurrence of 1987-1992 hydrology, implementation of a 30 percent unimpaired flow objective on the Tuolumne River would, in the final year of the drought, result in a total loss of 105,498 jobs throughout the RWS service territory, and a total loss in economic output of nearly \$37 billion. [Footnote 46: Bay Area Socioeconomic Impacts Resulting from Instream Flow Requirements for the Tuolumne River, The Brattle Group, prepared by David Sunding, Ph.D., March 15, 2017, attached hereto as Appendix 3 [ATT5], at 11, Table 11 (total job losses of CCSF of 33,237 + total job losses of BAWSCA member agencies, or "wholesale customers," of 72,261 = 105,498 total projected jobs lost throughout RWS service territory); id. at 10, Table 9 (total economic output losses for CCSF of \$8.248 billion + total economic losses of wholesale customers of \$28.654 billion = \$36.902 billion).] Using the same assumptions, implementation of a 40 percent unimpaired flow objective would result in a total loss of 120,063 jobs, and total loss in economic output of over \$43 billion. [Footnote 47: Id. at 11, Table 11 (total job losses of CCSF of 33,237 + total job losses of wholesale customers of 86,826 = 120,063 total projected jobs lost throughout the RWS service territory); id. at 10, Table 9 (total economic output losses for CCSF of \$8.248 billion + total economic losses of wholesale customers of \$35.179 billion = \$43.427 billion).] Under the same scenario, implementation of a 50 percent unimpaired flow objective would result in a total loss of 191,419 jobs, and total loss of economic output of over \$69 billion. [Footnote 48: Id. at 11, Table 11 (total job losses of CCSF of 73,886 + total job losses of wholesale customers of 117,533 = 191,419 total projected jobs lost throughout the RWS service territory); id. at 10, Table 9 (total economic output losses for CCSF of \$18.240 billion + total economic losses of wholesale customers of \$50.960 billion = \$69.200 billion).] Total job losses and economic output during the 6-year drought period are extremely dire. For example, again using the assumptions referenced above, and maximum contract deliveries of 265 mgd, implementation of a 40 percent unimpaired flow objective on the Tuolumne River would result a total loss of 657,316 jobs in the RWS service territory during the 6-year drought period, and total loss in economic output of over \$234 billion. [Footnote 49: Id. at 11, Table 11 (total job losses of CCSF of 179,961 + total job losses of wholesale customers of 477,355 = 657,316 total projected jobs lost throughout RWS service territory); id. at 10, Table 9 (total economic output losses for CCSF of \$44.707 billion + total economic losses of wholesale customers of \$190.057 billion = \$234.764 billion).]</p>	Please see response to comment 1166-10.
1166	25	<p>[From ATT1:] Assuming RWS pre-drought demand of 223 mgd, comparably severe job losses and loss in economic output would be experienced throughout the RWS service territory if the State Water Board implemented a 30, 40, or 50-percent unimpaired flow objective on the Tuolumne River. [Footnote 50: Bay Area Socioeconomic Impacts Resulting from Instream Flow Requirements for the Tuolumne River, The Brattle Group, prepared by David</p>	Please see response to comment 1166-10.

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		Sunding, Ph.D., March 15, 2017, attached hereto as Appendix 3 [ATT5], at 10-11, Tables 8 and 10.]San Francisco did not calculate economic losses associated with water supply reductions below the level of actual purchases of RWS water during the recent drought, i.e., 175 mgd (that would result from implementation of a 30, 40, or 50-percent unimpaired flow objective), because, among other reasons, there is too much uncertainty regarding how the Bay Area would be able to accommodate the projected level of growth in the region across the residential, commercial and industrial sectors if the SFPUC restricted its RWS service territory deliveries to 175 mgd. [Footnote 51: Id. at 8-9.]	
1166	26	[From ATT1:] Assuming maximum contract demands of 265 mgd, San Francisco and the SFPUC's wholesale customers throughout the Bay Area would need to increase rates for service in response to water supply restrictions and the attendant loss in revenue. [Footnote 52: Bay Area Socioeconomic Impacts Resulting from Instream Flow Requirements for the Tuolumne River, The Brattle Group, prepared by David Sunding, Ph.D., March 15, 2017, attached hereto as Appendix 3 [ATT5], at 12.] For example, if San Francisco were responsible for bypassing flow in compliance with a 40 percent unimpaired flow objective on the Tuolumne River, San Francisco would need to raise its rates by 7 percent, and the wholesale customers would need to increase their rates by 9 percent. [Footnote 53: Id.] These rates increases would not only "come on top of the some of the highest water rates among California water utilities" [Footnote 54: Id.], but would also be addition to estimated SFPUC rate increases of 8-9 percent for the next four years to pay for, among other things, completion of the WSIP and trhe design and planning of the Sewer System Improvement Program. [Footnote 55: SFPUC website, Your Dollars at Work Everyday, available at <a href="https://sfwater.org/index.aspx?page=749">https://sfwater.org/index.aspx?page=749</a> .]	Please see response to comment 1166-10.
1166	27	[From ATT1:] Increased rationing throughout the RWS [Regional Water System] service territory would result in significant environmental impacts that the SED did not analyze. The SED fails to assess the significant environmental impacts that would result if the SFPUC were compelled to drastically reduce water deliveries throughout the RWS service territory in response to the State Water Board's implementation of a 30, 40 or 50-percent unimpaired flow objective on the Tuolumne River. This critical omission constitutes an abuse of discretion because the SED fails to proffer any justification for why these impacts are not significant under CEQA, and, in fact, fails to present any analysis whatsoever regarding such impacts. (Pub. Res. Code, § 21168.5 [explaining that standard for judicial review of non-adjudicative decisions involving CEQA "shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the agency has not proceeded in a manner required by law or if the determination or decision is not supported by substantial evidence."]; Pub. Res. Code, § 21100(b)(1) ) [requiring lead agencies to prepare EIR for any project that they propose to carry out or approve that may have a significant effect on the environment that includes, inter alia, a detailed statement setting forth "[a]ll significant effects of the proposed project."]; Pub. Res. Code, § 21159(a)(1) ) [requiring agencies to perform environmental analysis at time of adoption of performance standard that must include "[a]n analysis of the reasonably foreseeable environmental impacts of the methods of compliance;" Cal. Code Regs., tit. 23, § 3777(b)(2) [requiring that a draft SED prepared by the State Water Board include, inter alia, "identification of any significant or potentially significant adverse environmental impacts of the proposed project."].)	Please see response to comment 1166-10. In addition, please refer to Master Response 1.1, General Comments, regarding the approach to analyses and substantial evidence standard.
1166	28	[From ATT1:] The SED fails to analyze the substantial loss in park vegetation, landscaping and trees (the urban forest) in jurisdictions throughout the RWS service territory that would result if the State Water Board implemented LSJR Alternatives 3 or 4, and San Francisco was	Please see response to comment 1166-10. It would be speculative to assume that potential increased water rationing and water use restrictions would occur such that they would degrade urban forests and natural areas in the SFPUC RWS service area to the point that they would be substantially affected. Please refer to

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		<p>responsible for bypassing 51.7 percent of the requisite flow. In this scenario, San Francisco would experience severe water shortages during sequential-year droughts that would require the SFPUC to significantly reduce deliveries to the RWS service territory. Given the demand hardening that has occurred in San Francisco and throughout the RWS service territory since the 1987-1992 drought as result of increased water use efficiency, it is reasonable to assume that severe cutbacks in outdoor water use would be required. Substantial reductions in outdoor water use would lead to the loss of park vegetation, urban landscaping, and the urban forest, and a corresponding array of adverse environmental impacts.</p>	<p>Master Response 1.1, General Comments, regarding the approach to analyses and the substantial evidence standard. Also, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding substantial evidence and speculation.</p>
1166	29	<p>[From ATT1:] Adverse Impacts to Aesthetic and Recreational Resources. In accordance with the substantive standards of CEQA, the State Water Board is required to examine aesthetics as part of its environmental review of the Plan Amendment because "courts have recognized that aesthetic issues are properly studied in an EIR to assess the impacts of a project." (Pocket Protectors v. City Of Sacramento (2004) 124 Cal.App.4th 903, 937 [citations omitted] [internal quotation omitted]; see also Preserve Poway v. City of Poway (2016) 245 Cal.App.4th 560, 577, reh'g denied (Apr. 4, 2016), review denied (June 22, 2016) [citing Pub. Res. Code, § 21060.5] .) [explaining that CEQA defines "environment" as including "objects of historic or aesthetic significance."]; see also CEQA Guidelines, Cal. Code Regs., tit. 14, Appendix G, Aesthetics I(b), [requiring the lead agency to determine whether "the project [would] substantially degrade the existing visual character or quality of the site and its surroundings?").) The loss of vegetation in parks and other public and private outdoor spaces located within the RWS service territory would have an adverse effect on aesthetic resources. Similarly, degradation of outdoor recreational areas would result in reduced use and enjoyment of those areas. The SED must analyze these impacts.</p>	<p>Please see response to Comment 1166-28.</p>
1166	30	<p>[From ATT1:] Adverse Impact to Cultural Resources. As the California Supreme Court instructs, "[t]he applicability of CEQA to historic structures is made clear by Public Resources Code sections 5020.1, subdivision (j), 21084, and 21060.5. Section 5020.1, subdivision (j) states: 'Historical resource' includes, but is not limited to, any . . . building, structure, site, area, place . . . which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." (Friends of Sierra Madre v. City of Sierra Madre (2001) 25 Cal.4th 165, 186, as modified (May 2, 2001) [internal quotation omitted].) A number of parks, open spaces, and heritage trees located in the RWS service territory are also cultural resources protected by applicable local, state, and/or national historical preservation requirements. It is reasonable to assume that significant cutbacks in outdoor water use for landscaping could result in degradation of historic landscapes located with the RWS service territory. The SED must analyze these impacts.</p>	<p>Please see response to comments 1166-10 and 1166-28. Furthermore, it would be speculative to assume with any degree of certainty how water use restrictions would affect designated significant historical resources. The significance of a historical resource is typically determined by a number of factors, including, but not limited to, contribution to a historic event or time period. Even if outdoor water use for landscaping was reduced, landscaping may only be one component of what makes the resource historically significant. It is speculative to assume that the landscaping contribution is significant and that landscaping would be affected such that it would result in a degradation of a designated historic resource.</p>
1166	31	<p>[From ATT1:] Increased Risk of Urban Wildfires. CEQA requires identification of the significant risk of wildfires adjacent to urbanized areas and in areas where residences are intermixed with wildlands. [Footnote 57: See CEQA Environmental Checklist Form, Appendix G, VII(h), available at <a href="http://resources.ca.gov/ceqa/guidelines/Appendix_G.html">http://resources.ca.gov/ceqa/guidelines/Appendix_G.html</a>.] It is reasonable to assume that heightened levels of rationing and water use restrictions would result in parched vegetation and desiccated trees thereby increasing fire hazards within and adjacent to urban areas in the RWS [Regional Water System] service territory. The SED must analyze these impacts.</p>	<p>Please see response to comments 1166-10 and 1166-28. It would be speculative to assume that potential increased water rationing and water use restrictions would occur such that they would affect urban development, and the potential loss of trees, vegetation, and other landscaping, which would then in turn potentially affect the increased risk of wildfires. As described in Appendix B, VIII(h) the State Water Board's Environmental Checklist, Public Resources Code section 4291 requires "that communities and residences located in State Responsibility Areas (SRAs) clear defensible space around homes and buildings to avoid loss associated with wildfires and follow the requirements of this defensible space (BOF 2006). The defensible space is not irrigated or watered, but rather is a complete clearing of vegetation from around structures to reduce or prevent the risk of damage during a fire. SRAs are areas where the State of California has the primary financial responsibility for the prevention and suppression of wildland fires (BOF 2012a)." Portions</p>

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			<p>of the Regional Water System are identified as SRAs, including parts of San Francisco County, San Mateo County, Santa Clara County, and Alameda County (BOF 2012aa). In addition, the State of California has identified some portions of those counties as Very High Fire Hazard Severity Zones (CalFire 2012). As described in Appendix B, “these designations allow the State to make recommendations to the local jurisdictions and the government code (Sections 51175–51982) then provides direction for the local jurisdiction to take appropriate actions to help reduce and control the potential for fire (BOF 2012b). This includes the enforcement of the defensible space requirements (BOF 2012b).” As reported by the California Department of Forestry and Fire Protection (CalFire) the three primary components required to reduce fire losses between urban and wildland interfaces are: building construction methods that reduce the hazard of building ignition; “Defensible Space” to reduce hazardous vegetation around houses and reduce the potential severity of wildfire exposure; and, identification of areas where there is a significant risk of interface fires and a history of such disastrous losses (CalFire 2013). These primary components have to do with local building codes, requirements, and the removal of vegetation within the defensible space around buildings, not ensuring there is water to irrigate vegetation. SFPUC and BAWSCA have been encouraging, and continue to encourage, residents and businesses within the SFPUC RWS service area to plant drought-tolerant plants when landscaping, and to convert lawns (SFPUC 2015, SFPUC 2016, BAWSCA N.D.). These types of plants help reduce risk, as CalFire recognizes that drought tolerant plants are generally fire-resistant when strategically placed to reduce the spread of fire (CalFire 2017). Given the above, the plan amendments would not alter the requirements of the state and local agencies to enforce defensible space requirements and other requirements to reduce the potential for fire and control fires in the SFPUC RWS service area. The plan amendments would not conflict with the primary components identified by CalFire to reduce fire loss in the SFPUC RWS service area.</p>
1166	32	<p>[From ATT1:] Adverse Impacts to Habitat. A "potential substantial impact on endangered, rare or threatened species is per se significant." (Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova (2007) 40 Cal.4th 412, 449, as modified (Apr. 18, 2007) [citing Cal. Code Regs., tit. 14, § 15065(a)(1)].) Urban forests and other natural areas within the RWS [Regional Water System] service territory provide habitat for wildlife, including threatened and endangered species, e.g., the Western Pond turtle, which has been known to inhabit Lake Merced and Golden Gate Park. [Footnote 58: Significant Natural Resources Area: Management Plan, February 2016, Executive Summary, available at <a href="http://sfrecpark.org/wp-content/uploads/SNRAMP_Final_Draft/SNRAMP_ExecSummary.pdf">http://sfrecpark.org/wp-content/uploads/SNRAMP_Final_Draft/SNRAMP_ExecSummary.pdf</a>, at 18 (noting that Lake Merced contains one of the last populations of Western Pond Turtles in San Francisco); San Francisco Planning Department, Planning Commission Draft Motion for San Francisco Westside Recycled Water Plant Project, California Environmental Quality Act (CEQA) Findings, September 3, 2015, available at <a href="http://commissions.sfplanning.org/cpcpackets/2015-007190GPR_3500_Great_Hwy_CEQAFindingsMotion.pdf">http://commissions.sfplanning.org/cpcpackets/2015-007190GPR_3500_Great_Hwy_CEQAFindingsMotion.pdf</a>, at 25 (noting that Western Pond turtles may be found at Metson Lake and Lloyd Lake in Golden Gate Park).] Degradation of urban forests and loss of vegetation in natural areas in the RWS service territory could adversely affect such species. The SED must analyze these impacts.</p>	<p>Please see responses to comments 1166-10 and 1166-28. It would be speculative to assume that potential increased water rationing and water use restrictions would occur such that they would degrade urban forests and natural areas to the point that wildlife (including threatened and endangered species) would be adversely affected.</p>
1166	33	<p>[From ATT1:] Effects on Energy Consumption, Human Health, Water Quality, Air Quality and Greenhouse Gas Emissions from the Exacerbation of Urban Heat Islands. Potentially significant project effects on energy consumption, human health, water quality, air quality, and, more specifically, greenhouse gas emissions, must be analyzed under CEQA. (See e.g., Pub. Res. Code, § 21100(b)(1) .) Urban development replaces permeable moist surfaces with surfaces and infrastructure that are impermeable and dry, such as conventional roofs, sidewalks, roads, and parking lots. [Footnote 59: U.S. Environmental Protection Agency,</p>	<p>Please see responses to comments 1166-10 and 1166-28.</p> <p>In addition, the comment does not provide information to support a conclusion that water rationing or conservation will result in the loss of tree, vegetation, or other landscaping resulting in urban heat islands. Water agencies, such as SFPUC typically promote water efficient landscapes rather than no landscapes. Even if there was increased urban development, it is speculative to assume that it would result in increased energy demands. Other factors may offset any increases in emissions associated with such development. For</p>



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		<p>Reducing Urban Heat islands: Compendium of Strategies, October, 2008, available at <a href="https://www.epa.gov/heat-islands/heat-island-compedium">https://www.epa.gov/heat-islands/heat-island-compedium</a>, attached hereto as Exhibit 11 [ATT19] at 7.] This process of urbanization is known to create urban "heat islands"--the phenomenon whereby urban regions experience warmer temperatures than their rural surroundings. [Footnote 60: Id.] Trees, vegetation, and other landscaping in the urban environment provide shade, which helps lower surface temperatures, and "also help reduce air temperatures through a process called evapotranspiration, in which plants release water to the surrounding air, dissipating ambient heat." [Footnote 61: Id.] It is reasonable to assume that increased water rationing and water use restrictions in the RWS [Regional Water System] service territory would result in the loss of trees, vegetation and other landscaping, and thereby reduce (and potentially eliminate) these cooling effects, thus intensifying the effects of urban heat islands. Exacerbation of urban heat islands has the potential to result in the following adverse environmental impacts.</p>	<p>instance, water rationing and water use restrictions may increase native landscaping, which would reduce water consumption, water pumping, and associated emissions. In addition, the rate of urbanization, growth, and infill development in a particular area generally influences the amount of heat generated by heat islands. The degree to which a local municipality or jurisdiction may implement measures to offset effects of urban heat islands (e.g., increased urban vegetation, reflective rooftops, etc.) and the degree to which affected areas may implement these measures are speculative. As discussed in Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, water supply is not the only factor to determining a change in rates of urbanization or the specific locations of housing, businesses, and development within the peninsula and outside of the peninsula. Therefore, the potential impacts raised by this comment are speculative.</p>
1166	34	<p>[From ATT1:] Increased Energy Consumption. "Appendix F of the CEQA Guidelines requires that projects assess the energy impacts of a project when a fair argument can be made that the project will have significant environmental impact." (California Clean Energy Committee v. City of Woodland (2014) 225 Cal.App.4th 173, 206 (citation omitted)). See also id. at 209 (citations omitted) (internal quotation omitted) ("[u]nder CEQA, an EIR is fatally defective when it fails to include a detailed statement setting forth the mitigation measures proposed to reduce wasteful, inefficient, and unnecessary consumption of energy. . . . The requirement to adopt energy impact mitigation measures is substantive and not procedural in nature and was enacted for the purpose of requiring the lead agencies to focus upon the energy problem in the preparation of the final EIR."). Urban heat islands increase energy demand for cooling during elevated summertime temperatures and thereby increase pressure on the electricity grid during peak periods of demand, that generally occur on hot, summer weekday afternoons when offices and homes are running cooling systems, lights, and appliances. [Footnote 62: U.S. Environmental Protection Agency, Reducing Urban Heat islands: Compendium of Strategies, October, 2008, available at <a href="https://www.epa.gov/heat-islands/heat-island-compedium">https://www.epa.gov/heat-islands/heat-island-compedium</a>, attached hereto as Exhibit 11 [ATT19] at 13.] The SED must analyze these impacts.</p>	<p>Chapter 14, Energy and Greenhouse Gases, Impact EG-3, identifies measures related to increased energy efficiency. Please see response to comment 1166-33 regarding urban heat islands and energy demands.</p>
1166	35	<p>[From ATT1:] Elevated Emissions of Air Pollutants and Greenhouse Gases. The CEQA Guideline on Determining the Significance of Impacts from Greenhouse Gas Emissions "provides that a lead agency should attempt to 'describe, calculate or estimate' the amount of greenhouse gases the project will emit, but recognizes that agencies have discretion in how to do so." (Center for Biological Diversity v. California Dept. of Fish and Wildlife (2015) 62 Cal.4th 204, 217, as modified on denial of reh'g (Feb. 17, 2016) (citing Cal. Code Regs., tit. 14, § 15064.4(a).) Urban heat islands increase summertime temperatures that, in turn, increase demand for electricity to run cooling systems. It is reasonable to assume that the generation of this additional electricity will result in increased emissions from power plants, thereby increasing emissions from air pollutants and greenhouse gases. [Footnote 63: U.S. Environmental Protection Agency, Reducing Urban Heat islands: Compendium of Strategies, October, 2008, available at <a href="https://www.epa.gov/heat-islands/heat-island-compedium">https://www.epa.gov/heat-islands/heat-island-compedium</a>, attached hereto as Exhibit 11 [ATT19] at 14.] The SED must analyze these impacts.</p>	<p>Please see response to comment 1166-33 regarding the urban heat islands and energy demands. Refer to Master Response 3.7, Greenhouse Gas Emissions and Analysis, for information about the evaluation of the greenhouse gas emissions in the SED.</p>
1166	36	<p>[From ATT1:] Compromised Human Health and Comfort. The California Legislature has made clear that public health and safety are of "great importance" in CEQA's statutory scheme. (California Bldg. Industry Assn. v. Bay Area Air Quality Management Dist. (2015) 62 Cal.4th 369, 386 (citing Pub. Res. Code, §§ 21000(b) , (c) , (d) , (g) ; §§ 21001(b), (d) .) For example,</p>	<p>Please see response to comment 1166-33 regarding urban heat islands.</p>

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		<p>Public Resources Code Section 21083(b)(3) requires a finding of a "significant effect on the environment" whenever "[t]he environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly." (Pub. Res. Code, § 21083(b)(3) .) "Increased daytime surface temperatures, reduced nighttime cooling, and higher air pollution levels associated with urban heat islands can affect human health by contributing to general discomfort, respiratory difficulties, heat cramps and exhaustion, non-fatal heat stroke, and heat-related mortality." [Footnote 64: U.S. Environmental Protection Agency, Reducing Urban Heat islands: Compendium of Strategies, October, 2008, available at <a href="https://www.epa.gov/heat-islands/heat-island-compendium">https://www.epa.gov/heat-islands/heat-island-compendium</a>, attached hereto as Exhibit 11 [ATT19] at 14.] The SED must analyze these impacts.</p>	
1166	37	<p>[From ATT1: Impaired Water Quality. The CEQA Guidelines require identification of project effects that will substantially degrade water quality. [Footnote 65: See CEQA Environmental Checklist Form, Appendix G, VIII(f), available at <a href="http://resources.ca.gov/ceqa/guidelines/Appendix_G.html">http://resources.ca.gov/ceqa/guidelines/Appendix_G.html</a>.] In the urban environment, the temperature of stormwater can substantially increase as it traverses pavement and rooftop surfaces, reaching "temperatures 50 to 90°F (27 to 50°C) higher than air temperatures." [Footnote 66: EPA Compendium Urban Heat Islands [ATT19], supra note 59, at 15.] Urban heat islands intensify this effect by transferring excess heat to stormwater and thereby degrading water quality. [Footnote 67: Id.] The elevated temperature of stormwater that becomes runoff raises the water temperature of local streams, rivers, ponds, and lakes. [Footnote 68: Id.] Heightened water temperatures that result from this transference of heat from urban areas to local water bodies may detrimentally affect the reproduction and metabolism of many aquatic species. [Footnote 69: Id.] The SED must analyze these impacts.</p>	<p>Please see response to comment 1166-33 regarding urban heat islands.</p>
1166	38	<p>[From ATT1: The adverse environmental impacts of heightened levels of water supply rationing in the RWS service territory may be inconsistent with state and local plans promoting green infrastructure. "[A]n EIR must 'discuss any inconsistencies between the proposed project and applicable general plans, specific plans and regional plans.'" (Joshua Tree Downtown Business Alliance v. County of San Bernardino (2016) 1 Cal.App.5th 677, 695, review denied (Oct. 12, 2016) (citing Cal. Code Regs., tit. 14, § 15125(d).) The California Legislature recognizes the social and environmental values of green infrastructure. [Footnote 70: See EPA web page entitled "What is Green Infrastructure?," available at <a href="https://www.epa.gov/greeninfrastructure/what-green-infrastructure">https://www.epa.gov/greeninfrastructure/what-green-infrastructure</a>, attached hereto as Exhibit 12 [ATT20] (explaining that "Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the neighborhood or site scale, stormwater management systems that mimic nature soak up and store water.") (See Gov. Code, § 65593(d) ["[l]andscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development."].) Further, a number of state and local policies encourage green infrastructure, i.e., landscaping and open space areas, in order to provide social and environmental benefits, including improved water quality and groundwater recharge. [Footnote 71: See e.g., Strategic Plan for the San Francisco Department of the Environment 2013-2017, available at <a href="https://sfenvironment.org/sites/default/files/agenda/attach/deptoftheenvironment_strategic_plan_final_draft.pdf">https://sfenvironment.org/sites/default/files/agenda/attach/deptoftheenvironment_strategic_plan_final_draft.pdf</a>, at 11 ("Green spaces--natural and planted by humans--provide a broad spectrum of benefits to the environment and to our quality of life. The Department of</p>	<p>Please see responses to comments 1166-10 and 1166-28. It would be speculative to assume that potential increased water rationing and water use restrictions would occur such that they would degrade the landscape and be inconsistent with state and local plans promoting green infrastructure.</p>

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		<p>the Environment is dedicated to protecting and restoring our indigenous natural areas and maximizing the value of all of our vegetated resources, including parks, street trees, green roofs, open spaces, streetscapes, and community gardens, both for people and wildlife."]. See also At Risk: the Bay Area Greenbelt, 2017, Greenbelt Alliance, available at <a href="http://www.greenbelt.org/at-risk-2017/">http://www.greenbelt.org/at-risk-2017/</a>, attached hereto as Exhibit 13 [ATT21] at 9 (identifying an array of policies that may be adopted at the federal, state, or local levels, or through private initiative, to protect open spaces and natural resources from development).]As the State Water Board's implementation of LSJR Alternatives 3 or 4 may have the effect of degrading landscaping and open spaces in the RWS service territory, as discussed, the SED must identify, discuss, and reconcile the inconsistencies with state and applicable local plans that promote green infrastructure.</p>	
1166	39	<p>[From ATT1:] If water supplies were insufficient to serve new customers in the Bay Area, water suppliers throughout the RWS service territory may adopt policies that force new development to go elsewhere, and businesses may choose to locate in areas with more reliable dry-year and future water supplies. California law requires that prior to approving a proposed large-scale development, a local government agency must consider, as part of its environmental review, whether water supplies are available to meet the projected future demand of the project for multiple dry years. When a proposed, large-scale development is subject to CEQA, and is considered a "project" within the meaning of Water Code Section 10912, a Water Supply Assessment ("WSA") is required. [Footnote 72: See Wat. Code, § 10912 (defining "Project" to mean a proposed large-scale residential, commercial or industrial development, i.e., "residential development of more than 500 dwelling units", "shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space"; "commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space"; "hotel or motel, or both, having more than 500 rooms"; "industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area"; "mixed-use project that includes one or more of the projects specified in this subdivision"; or, a "project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project."); see also Cal. Code Regs., tit. 14, § 15155(a)(1) (similarly defining a "water-demand project").] (Citizens for Responsible Equitable Environmental Development v. City of San Diego (2011) 196 Cal.App.4th 515, 523-24 [citing Wat. Code, § 10910(b).]) The WSA is part of the EIR process and is intended to assist local governments in deciding whether to approve proposed projects. (O.W.L. Foundation, 168 Cal.App.4th at 576.) If the projected water demand of the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the WSA must discuss whether the public water system's "total projected water supplies available during normal, single dry, and multiple dry water years" for a 20-year period will meet the "projected water demand [for] the proposed project," taking into account the agency's "existing and planned future uses, including agricultural and manufacturing uses." (Wat. Code, § 10910(c)(3)).) If a local government, i.e., a city or county, will provide the water supply, the local government must prepare the WSA. (Wat. Code, § 10910(b).) "The local government must include the WSA in the EIR and consider it when deciding whether to approve the project." (O.W.L. Foundation, 168 Cal.App.4th at 576 [citing Wat. Code, § 10911 (b)].) Further, a provision of CEQA requires compliance with the Water Code Sections pertaining to WSAs. (Pub. Res. Code, § 21151.9.) (See also Cal. Code Regs., tit. 14, § 15155(e) [lead agency shall include water assessment in the EIR].) Significantly, if the WSA does not identify sufficient available water,</p>	<p>This comment primarily provides information about water supply assessments. The comment does not raise significant environmental issues or make a comment regarding the plan amendments; therefore, no further response is required. Nonetheless, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply to the SFPUC RWS service area with implementation of the plan amendments and the adequacy of the analysis in the SED. The commenter appears to suggest that the plan amendments will result in water supply assessments (WSA) that do not identify sufficient available water for large scale developments, which in turn will cause water suppliers to adopt policies that "force new development to go elsewhere." The modern WSA requirement was adopted as part of the "show me the water" package passed by the legislature in 2001 which included SB 610 (Costa). As stated in the September 12, 2001 Senate Floor Analysis for SB 610, the bill's proponents asserted that providing early knowledge of where growth is being planned would ensure that planning for new water supplies would begin as early as possible. Importantly, those proponents stated, that this "early planning is essential as California's water supply future evolves away from heavy reliance on dams and reservoirs and towards a more diversified mix of water projects: additional reclamation, conservation, conjunctive use, water transfers, offstream storage, desalination facilities, and other strategies." In other words, SB 610 recognized that changing water needs should be met but that it would require planning and implementation of a diverse portfolio of actions. The WSA requirement in SB 610 was meant to facilitate that planning and implementation by no longer allowing large-scale residential, commercial, or industrial developments to rely on unsustainable water assumptions. That approach is consistent with the SED, including Appendix L, City and County of San Francisco Analyses. Those analyses summarize the portfolio of actions SFPUC could take to meet water supply demand to make up any reductions in water supply from its existing dam and reservoir. The SED recognizes that those actions could include, for example, payments to the irrigation districts on the Tuolumne River to release water to meet flow requirements (thus allowing CCSF to retain water in Hetch Hetchy), water transfers, In-Delta diversion(s), and desalination. Moreover, the SED analyzes the possible environmental effects of water transfers in Appendix L and analyzes the cost and environmental evaluation of constructing and operating in-Delta diversions or a desalination plant in Chapter 16, Evaluation of Other Indirect and Additional Actions. As identified in the SED, Table L.6-4, the 2010 baseline economic output of San Francisco County was approximately \$125 billion and the Bay Area Region as a whole was approximately \$645 billion. It is unreasonable to assume that a region with \$645 billion in economic output will refuse to implement water supply actions and, as the commenter suggests, chill commerce by suggesting it go elsewhere. This conclusion is also unsupported by the CCSF 2015 Urban Water Management Plan (UWMP), which acknowledges the potential for new state and federal regulations that may require additional water releases for the preservation of aquatic species. The UWMP contains goals and objectives for the CCSF's Water System Improvement Program (WSIP), including meeting "at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat" as well as the need to "diversify water supply options during non-drought and drought periods and to improve the use of new water sources and drought management including groundwater, recycled water, conservation, and transfers." In Preserve Wild Santee</p>

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		<p>then the lead agency must include that determination in its findings in the EIR for the project. (Cal. Code Regs., tit. 14, § 15155(e).)</p>	<p>v. City of Santee (2012) 210 Cal.App.4th 260, the court invalidated an Environmental Impact Report (EIR) for including, among other deficiencies, an inadequate water supply assessment. The court held that where it is impossible to confidently determine the availability of anticipated future water sources, the EIR must discuss “possible replacement sources or alternatives” and the “environmental consequences of those contingencies.” (Preserve Wild Santee at p. 285, citing Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova (2007) 40 Cal.4th 412, 432.) That means that even if a local government could not rely on the current projections in the CCSF UWMP, even with the water supply improvements anticipated by the WSIP, the development action is still not barred. Instead, the local government would need to identify replacement sources, such as those identified programmatically in the SED, and analyze them on a project-specific level.</p>
1166	40	<p>[From ATT1:] When water supplies are insufficient to serve new customers, water suppliers may rely on various sources of authority to adopt policies that limit or prohibit growth, including the adoption of water neutral programs and development moratoria. Water neutral programs, often referred to as demand offset programs, require new development that causes increased water demand to offset such demand through conservation or new supplies with the goal of ensuring that the new development will not result in increased demand on the water supplier’s system. [Footnote 73: Jennifer L. Harder, Demand Offsets: Water Neutral Development in California (2014) 46 McGeorge L. Rev. 103, at 104-105.] These programs increase costs for developers, which may result in higher home prices, less affordable housing, and, if the costs of offsets and in-lieu fees are too high, may preclude new development altogether. [Footnote 74: Id. at 110 (citations omitted) (noting that “[f]oregone development may result in fewer jobs, less economic growth, and lost amenities to the community.”)] Water suppliers, e.g., cities, counties and special districts, have varying degrees of authority to require water conservation, manage and protect water supplies, and mitigate impacts that they may rely on to adopt water neutral programs. [Footnote 75: Id. at 153.] Water suppliers that approve a water neutral program by way of ordinance or resolution typically invoke Article X section 2 of the California Constitution, that requires all uses of water in the state to be reasonable and not wasteful, and Water Code Sections 375, et seq., that provides all water suppliers in the state with authority to adopt water conservation programs. [Footnote 76: Id. at 156; Cal. Const., art. X, § 2; Wat. Code, § 375(a).] Cities and counties also routinely identify the police power in their recitals, while special districts cite to specific organic statutes, where such exist, as authorization “to take action to avoid and mitigate the effect of new demand on existing customers.” [Footnote 77: Jennifer L. Harder, supra note 73, at 154-155 (citations omitted).]</p>	<p>The commenter is discussing the utilization of water neutral programs to offset supply inefficiencies. The comment does not raise significant environmental issues or make a comment regarding the plan amendments; therefore, no further response is required.</p>
1166	41	<p>[From ATT1:] The Water Code authorizes a water supplier to declare a water shortage emergency in its service area “whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply . . . to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.” (Wat. Code, § 350.) “A water shortage emergency condition within the meaning of section 350 includes both an immediate emergency, in which a district is presently unable to meet its customers’ needs, and a threatened water shortage, in which a district determines that its supply cannot meet an increased future demand.” (Building Industry Assn. v. Marin Mun. Water Dist. (1991) 235 Cal.App.3d 1641, 1646 [citation omitted].) Once a government agency has declared a water shortage emergency in its service area, it must adopt regulations to conserve its water supply for “the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.” (Wat. Code, § 353.) Water Code Section 356 expressly authorizes the adoption of development moratoria by providing that such regulations “may include the right to deny applications for</p>	<p>The commenter is summarizing Water Code with regard to declaring a water shortage emergency, and the requirements once such an emergency has been declared. The comment does not raise significant environmental issues or make a comment regarding the plan amendments; therefore, no further response is required.</p>

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		<p>new or additional service connections." [Footnote 78: The adoption of development moratoria during a water shortage emergency, and under circumstances in which significant rationing had already been implemented, would be consistent with the State Water Board's own practice. See e.g., State Water Board Issues Moratorium on New Water Connections, available at <a href="http://www.dailydemocrat.com/article/ZZ/20141105/NEWS/141103990">http://www.dailydemocrat.com/article/ZZ/20141105/NEWS/141103990</a>, attached hereto as Exhibit 14 [ATT22] (explaining that in 2014 the SWRCB "slapped" 22 water districts across the state with development moratoriums due to lack of adequate water supply).] (Wat. Code, § 356.) Where a water shortage emergency exists, "the water shortage emergency provisions of the Water Code may provide a basis for adoption of a water neutral program." [Footnote 79: Jennifer L. Harder, Demand Offsets: Water Neutral Development in California (2014) 46 McGeorge L. Rev. 103, supra note 73, at 156. See also Building Industry Assn., 235 Cal.App.3d at 1647-48 ("Read together, [Water Code] sections 353 and 356 unquestionably allow districts to distinguish between all existing or current consumers and potential users when deciding how to respond to a water shortage emergency. . . .").]</p>	
1166	42	<p>[From ATT1:] Municipal water suppliers in the Bay Area have adopted policies to limit or prohibit growth when there was insufficient water available to serve new customers. The following example illustrates circumstances in which municipal water suppliers in the Bay Area have adopted policies to limit or prohibit growth where providing water service to a new project would impose a risk of water supply shortages on its existing customers, or where the additional water supply needed to serve proposed development was simply not available to the municipal water system. EBMUD's Water Neutral Program. In order to provide water service to proposed developments, yet avoid imposing "a risk of shortages on its existing customers," the East Bay Municipal Utility District ("EBMUD") adopted its own water neutral program for out-of-service-area subdivisions, that, in at least one instance, required certain developers to offset the water demand of a new residential project by a ratio of 2:1, meaning that "twice as much water would be conserved through various efficiency measures as would be required to serve the development's needs." [Footnote 80: Randle Kanouse, Douglas Wallace, Optimizing Land Use and Water Supply Planning: A Path to Sustainability? (2010) 4 Golden Gate U. Envtl. L.J. 145, 148, 156, 158. See also Jennifer L. Harder, supra note 69, at 149 (explaining that "EBMUD had designed its own water neutral program for out-of-service-area subdivisions . . .").] It is important to emphasize that EBMUD did not implement its water neutral program for subdivisions located outside of its service territory to mitigate insufficient water supply for existing customers. Instead, EBMUD implemented its water neutral program in order to facilitate development of the proposed subdivisions while simultaneously protecting its existing customers from heightened risk of future water supply shortages. Many water agencies in the RWS service territory contemplate implementation of water neutral programs to address the more pressing issue of lack of adequate water supply to serve existing customers as part of their drought contingency planning.] EBMUD relies on diversions from the Mokelumne River as its primary source of supply. [Footnote 81: Randle Kanouse, supra note 80, at 156 (citation omitted).] The Mokelumne River flows west from the central Sierra Nevada into the Central Valley and ultimately the Delta, where it empties into the San Joaquin River. Similar to other water suppliers that depend on runoff from rivers that feed the Delta, EBMUD faces future challenges to the reliability of its water supply, including increasingly stringent environmental requirements to restore degraded habitat in the Delta that "will call for more flow releases by all water users over time," and the threat that climate change will "inflict more frequent and more intense droughts in California, intensifying the already significant challenges to water supply reliability." [Footnote 82: Id. (citations omitted).] The first</p>	<p>The commenter provides an example of circumstances in which municipal water suppliers in the San Francisco Bay Area have adopted policies to limit or prohibit growth where providing water service to a new project would impose a risk of water supply shortages on its existing customers, or where the additional water supply needed to serve proposed development was simply not available to the municipal water system. The comment does not raise significant environmental issues or make a comment regarding the plan amendment; therefore, no further response is required.</p>

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		<p>generation of water neutral residential projects that sought water service from EBMUD required annexation into the utility's service area, and thus, were "inherently controversial and strongly opposed by environmental interests." [Footnote 83: Id. at 157.] EBMUD's ultimate agreement to provide water to these projects "was contingent on the implementation of water efficiency measures with a 1:1 offset ratio." [Footnote 84: Id.] Subsequently, in 2001, a proposed 1,200-home residential development called the Camino Tassajara Integrated Project, that included schools, community centers, and associated buildings, approximately 40 percent of which lay outside of EBMUD's service boundary, sparked an even greater controversy. [Footnote 85: Id. (citation omitted).] One of the issues that militated against providing water to the development was the fact that "EBMUD had only just concluded a decades-long process of securing a supplemental supply for drought years, with its Freeport Regional Water Project on the Sacramento River," and "[t]he sizing of that project had not accounted for potential new demand outside EBMUD's service area." [Footnote 86: Id. (citation omitted).] EBMUD ultimately annexed the project into its service area on the condition that the developers finance water efficiency features that would achieve a 2:1 offset of the project's demand. [Footnote 87: Id. at 158 (citation omitted).] "This higher requirement was intended to provide a stronger guarantee (with commensurate funding) that existing EBMUD customers would not face a higher risk of water shortages as a result of the EBMUD's agreement to serve Camino Tassajara." [Footnote 88: Id. (citation omitted).]</p>	
1166	43	<p>[From ATT1:] Municipal waters suppliers in the Bay Area have adopted policies to limit or prohibit growth when there was insufficient water available to serve new customers. The following example illustrates circumstances in which municipal water suppliers in the Bay Area have adopted policies to limit or prohibit growth where providing water service to a new project would impose a risk of water supply shortages on its existing customers, or where the additional water supply needed to serve proposed development was simply not available to the municipal water system. East Palo Alto's Development Moratorium. On July 19, 2016, the City Council for the City of East Palo Alto ("East Palo Alto") approved an ordinance prohibiting new or expanded water connections within the service territory of East Palo Alto's water system. [Footnote 89: City of East Palo Alto Agenda, City Council Regular Meeting, July 19, 2016, City Council Agenda Report, P&amp;A Item No. 10D, Approving an Ordinance Prohibiting New or Expanded Water Connections to the City of East Palo Alto Water System, available at <a href="http://www.ci.east-paloalto.ca.us/AgendaCenter/ViewFile/Agenda/07192016-1211">http://www.ci.east-paloalto.ca.us/AgendaCenter/ViewFile/Agenda/07192016-1211</a>, attached hereto as Exhibit 15 [ATT23] (referred to below as "Agenda Report"), at 242. San Francisco understands that East Palo Alto is in the process of attempting to identify alternative ways to address its water needs.] All of the water in East Palo Alto's water system is supplied by the RWS [Regional Water System]. [Footnote 90: Id.] East Palo Alto has an Interim Supply Guarantee ("ISG") of 1.963 MGD, or approximately 2,199 AF. [Footnote 91: Id.] According to the City Council Agenda Report ("Agenda Report") for the ordinance, on average East Palo Alto has been using "approximately 95%, or practically all of its ISG for the last 14 years, and in some years (2006, 2007, 2012) exceeded its ISG." [Footnote 92: Id.] The Agenda Report explains that for the purpose of long range planning, East Palo Alto "needs to take in account the demand for entitled projects that are under construction, or not yet built, and for potential SFPUC dry year mandatory cutbacks." [Footnote 93: Id. at 244.]After accounting for the demand needed to supply entitled projects, only 13 percent of East Palo Alto's supply remains available. [Footnote 94: Id.] Further, if the SFPUC imposes mandatory rationing, it can reduce deliveries to East Palo Alto by 6 percent, leaving only 7 percent of the system's supplies available. [Footnote 95: Id.] As this "very small amount" of water supply "leaves no</p>	<p>The comment provides an example of the adoption of policies to limit or prohibit growth as a result of potential limits to water supplies in the SFPUC RWS service area. The comment does not raise significant environmental issues or make a comment regarding the plan amendment. Please see response to comment 1166-39. Please also see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding a discussion of water transfers, including a transfer between Mountain View and East Palo Alto.</p>

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		<p>room for error," the City Council concluded that under these conditions "the City cannot entitle additional projects, and there is a de facto moratorium in place for any new construction in the City that creates demand for additional water supply." [Footnote 96 Id. at 244, 247. Thus, East Palo Alto did not adopt its development moratorium due to a water shortage brought on by drought, but instead, the crisis in East Palo Alto resulted from the City's insufficient water allocation. Many water agencies in the RWS service territory contemplate implementation of development moratoria to address lack of adequate water supply due to drought as part of their drought contingency planning.] Numerous proposed projects were rejected in accordance with the moratorium, including "[a]n affordable housing project owned by the city," and "11 other developments that had recently submitted applications to build in East Palo Alto." [Footnote 97: Landgraf, K., "East Palo Alto imposes development moratorium due to lack of water," Mercury News (July 20, 2016) available at <a href="http://www.mercurynews.com/2016/07/20/east-palo-alto-imposes-developmentmoratorium- due-to-lack-of-water/">http://www.mercurynews.com/2016/07/20/east-palo-alto-imposes-developmentmoratorium- due-to-lack-of-water/</a>, attached hereto as Exhibit 16 [ATT24] (explaining that "[a] water crisis three decades in the making came to a head this week when East Palo Alto's City Council imposed a moratorium on development until the city can increase its historically meager water supply. . . . [numerous] proposed developments are out of luck. An affordable housing project owned by the city did not make the cut, nor did 11 other developments that had recently submitted applications to build in East Palo Alto. Many of those developers showed up at Tuesday's meeting to voice their displeasure.".)].Significantly, the Agenda Report provides that the "Water Moratorium period" will provide staff time to study the water shortage issue and "develop new water supply and water demand offset policies for the City Council to consider for adoption." [Footnote 98: Agenda Report, supra note 89, at 247.] The Agenda Report further explains that upon adoption of a "Water Demand Offset Policy" staff would request that City Council update the exemption provisions in the moratorium ordinance to include projects that use the offset policy. [Footnote 99: Id.]</p>	
1166	44	<p>[From ATT1:] Many of the SFPUC's wholesale customers explicitly contemplate adoption of policies to limit or prohibit growth as part of their drought water supply planning. For example, Alameda County Water District's ("ACWD") Water Shortage Contingency Plan calls for a "[n]et zero water demand increase by new developments" if the district experiences a 30 to 50-percent reduction in its water supplies. [Footnote 100: ACWD UWMP, supra note 41, at 10-9, Table 10-3d. See also id. at G-17, Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan--Consumption Reduction Methods (indicating that at "Stage 4," i.e., 30 to 50-percent reduction in water supply, ACWD would adopt a "Moratorium or Net Zero Demand Increase on New Connections," meaning that the district would impose "[t]emporary restrictions on supply to new developments and/or requirements to implement extreme water use efficiency measures, and net zero increase for new developments (stage 4).".]Similarly, the Water Shortage Contingency Plans for the City of Burlingame and the Menlo Park Municipal Water District ("MPMWD") call for the adoption of development moratoriums with limited exceptions, including where the project applicant demonstrates that it will be able to offset completely its water demand, in response to a shortage of between 31 to 50-percent of existing supply. [Footnote 101: 2015 Urban Water Management Plan for the City of Burlingame, June 2016, available at <a href="https://www.burlingame.org/modules/showdocument.aspx?documentid=13858">https://www.burlingame.org/modules/showdocument.aspx?documentid=13858</a>, at Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses (explaining that during a "Stage 5" water supply reduction, "[n]o new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates or</p>	<p>The comment provides examples of policies limiting or prohibiting growth as part of agencies' drought water supply planning. The comment does not raise significant environmental issues or make a comment regarding the plan amendment; therefore, no further response is required.</p>

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		<p>letters of availability) shall be issued by the City, with exceptions."); id. at Table 7.5 (identifying 4 exceptions to the prohibition on new water connections referenced above, including where the "applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) . . ."); see also id. at Table 8-1 Retail: Stages of Water Contingency Plan (defining Stage 5 as circumstance in which there has been a "[d]eclaration by Burlingame City Council . . . or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 31% to 50% due to water supply shortages or emergency."). [Footnote 101, continued: 2015 Urban Water Management Plan for the Menlo Park Municipal Water District, June 2016, available at <a href="http://www.menlopark.org/DocumentCenter/View/10111">http://www.menlopark.org/DocumentCenter/View/10111</a>, at Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan--Consumption Reduction Methods (emphasis added) (explaining that during a "Stage 5" water supply reduction "MPMWD shall not approve new potable water service, new temporary meters or permanent meters, or issue statements of immediate availability to serve or provide potable water service (such as, will-serve letters, certificates or letters of availability), except under the following circumstances: (1) a valid, unexpired building permit has been issued for the project; (2) the project is necessary to protect the public's health, safety, and welfare; (3) the applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the Public Works Director; or (4) to provide continuation of water service or to restore service that has been interrupted for a period of one year or less."); see id. at Table 8-1 Retail: Stages of Water Shortage Contingency Plan (defining Stage 5 as a circumstance in which there has been a "[d]eclaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required voluntary or mandatory reduction in water use from 31% to 50% due to water supply shortages or emergency.").]Further, the Water Shortage Contingency Plan for the Westborough Water District ("WWD") requires the establishment of a "moratorium on new connections and new landscaping" in response to a reduction of up to 20 percent of existing supply [Footnote 102: WWD UWMP, supra note 39, at 65 (explaining that in response to a "Stage 3" reduction in water supply WWD will "[e]stablish moratorium on new connections and new landscaping."); id. at 59, Table 7-2--Stages of Water Shortage Contingency Plan (DWR Table 8-1) (defining "Stage 3" as up to a 20-percent water supply reduction).], and the 2015 Urban Water Management Plan for the City of Redwood City calls for a "[m]oratorium on new water connections" in response to a reduction of 20 to 30-percent of its water supply. [Footnote 103: 2015 Urban Water Management Plan for the City of Redwood City, June 2016, available at <a href="http://www.redwoodcity.org/home/showdocument?id=8091">http://www.redwoodcity.org/home/showdocument?id=8091</a>, at 109, Table 7-5 (explaining that in response to a "Stage 4" reduction in water supply the City of Redwood City will establish a "[m]oratorium on new water connections" and defining "Stage 4" as a 20-30-percent "[c]utback" in water supply.)]</p>	
1166	45	<p>[From ATT1:] If LSJR Alternatives 3 or 4 were implemented, it is reasonable to assume that the pattern of growth called for in Plan Bay Area would be displaced due to inadequate water supply in the RWS [Regional Water System] service territory. Plan Bay Area calls for consolidation of new growth in urban centers. Plan Bay Area was adopted by the Association of Bay Area Governments ("ABAG") and the Metropolitan Transportation Commission ("MTC") in 2013 in accordance with "The California Sustainable Communities and Climate Protection Act of 2008" (California Senate Bill 375 ["SB 375"], Steinberg), which requires each of California's 18 metropolitan areas--including the Bay Area--to reduce greenhouse gas emissions from cars and light trucks. [Footnote 104: Plan Bay Area: A</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to</p>



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		<p>Strategy for a Sustainable Region, July 18, 2013, Association of Bay Area Governments, Metropolitan Transportation Commission, available at <a href="http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf">http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf</a>, attached hereto as Exhibit 17 [ATT 25] (referred to below as "Plan Bay Area 2013"), at 4.] SB 375 directs "the Bay Area and other California regions [to] develop a Sustainable Communities Strategy (SCS)--a new element of the regional transportation plan (RTP)--to strive to reach the greenhouse gas (GHG) reduction target established for each region by the California Air Resources Board." [Footnote 105: Id.] SB 375 also "requires regions to plan for housing that can accommodate all projected growth, by income level, so as to reduce the pressures that lead to in-commuting from outside the nine-county region." [Footnote 106: Id. at 99.] Plan Bay Area 2013 is the region's first RTP subject to SB 375. [Footnote 107: Id.] Although Plan Bay Area 2013 has multiple performance targets, "[t]wo of the targets are not only ambitious--they are mandated by state law." [Footnote 108: Id. at 5.] The first mandatory target addresses climate protection by requiring the Bay Area to reduce its per-capita CO2 emissions from cars and light-duty trucks by 7 percent by 2020 and 15 percent by 2035. [Footnote 109: Id. at 4-5.] "The second mandatory target addresses adequate housing by requiring the region to house 100 percent of its projected population growth by income level." [Footnote 110: Id. at 5. See also id. at 19, 43 (explaining that SB 375 requires that the Bay Area identify a land use pattern for projected growth (from a 2010 baseline year) that will, inter alia, house 100-percent of the region's projected 25-year population growth by income level (very-low, low, moderate, above-moderate) without displacing current low-income residents.)] In order to help achieve the Bay Area's GHG emissions reduction and housing targets, Plan Bay Area 2013 identifies a land use pattern that "directs new growth within locally adopted urban growth boundaries to existing communities along major transit corridors." [Footnote 111: Id. at 43, 45.] Plan Bay Area 2013 projects that between 2010 and 2040 the nine-county Bay Area will: grow in population from 7.2 million to 9.3 million, an increase of 2.1 million people, or 30 percent; add 1.1 million jobs; and, increase its housing stock by 3.4 million new homes. [Footnote 112: Id. at 7, 30.] Due to the high cost of housing in the region, for decades "an ever-increasing number of people who work in the Bay Area" have been compelled "to look for more affordable housing in the Central Valley or other surrounding regions." [Footnote 113: Id. at 99; id. at 45 (noting that "past trends saw the outward expansion of urban growth in the region and spillover growth in surrounding regions . . ."). See also SED, at 11-12 ("spillover from the Bay Area is causing growth stress in the San Joaquin Valley as commuters seek affordable housing. Over the past 35 years, the northern San Joaquin Valley, including San Joaquin, Stanislaus and Merced Counties, has experienced explosive growth in the numbers of workers who commute north and west out of the valley each day. By 2010, that was estimated to be about 24 percent of workers working outside their county of residence with about 46,000 heading towards the Bay Area . . ."). To address this incongruity, Plan Bay Area 2013 calls for the majority of projected growth to occur in Priority Development Areas ("PDAs") that are "transit-oriented, infill development opportunity areas within existing communities" because, as explained by ABAG and MTC, "[c]ompact infill development can reduce vehicle use and vehicle miles traveled by 20 to 60-percent when compared to traditional suburban developments." [Footnote 114: Plan Bay Area 2013, supra note 104, at 77, 123. See also id. at 99 (explaining that "[t]he resulting longer-distance commutes increase emissions while also raising transportation costs for the residents who must venture so far afield in search of more affordable housing. This places a greater burden on lower-income residents and further increases the divide between the region's more-affluent and less-affluent residents. The region's businesses also suffer, since the dispersal of workers tends to constrain the supply of labor they can draw on."); id. at 54 (noting that "[o]ne vehicle (regardless of the number</p>	<p>replace any reductions in water supplies with alternative sources of water. Also see Master Response 8.5, regarding water supply as it pertains to regional growth and development in the SFPUC RWS service area. See also Master Response 6.1, Cumulative Analysis, for information regarding growth inducing effects and housing factors, and Master Response 8.4, Non-Agricultural Economic Considerations, regarding potential effects on growth. Plan Bay Area is a regional transportation plan and sustainable communities strategy that, in part, integrates transportation, land-use and housing as part of a strategy to reduce greenhouse gas emissions. For the reasons discussed in the master responses above, and in comment 1166-39, there is no support for the suggestion that the plan amendments will result in inadequate water supplies in the SFPUC RWS service area such that the pattern of growth called for in Plan Bay Area would be displaced. The plan amendments are not required to meet the reduction targets mandated by SB375 and identified in the Plan Bay Area, as the plan amendments are part of a the Bay-Delta Water Quality Control Plan and not an element the Plan Bay Area. The reduction targets are only applicable to Plan Bay Area, and Plan Bay Area is a regional transportation plan indicating how regional transportation planning will be implemented and funded.</p>

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		<p>of passengers) traveling one mile constitutes one ‘vehicle mile.’ The number of vehicle miles traveled is highly correlated with greenhouse gas emissions.”.)] To promote this pattern of development, Plan Bay Area 2013 “makes investments in the region’s transportation network that support job growth and new homes in existing communities by focusing the lion’s share of investment on maintaining and boosting the efficiency of the existing transit and road system.” [Footnote 115: Id. at 63.] However, Plan Bay Area 2013 also supports focused growth in PDAs, including major new transit projects, such as the extension of BART to serve San Jose. [Footnote 116: Id. at 79-80.] In addition to reducing GHG emissions and accommodating demand for new housing “within locally adopted urban growth boundaries,” the land use pattern posited by Plan Bay Area 2013 conserves existing open space, natural resources and agriculture lands in the region. [Footnote 117: Id. at 45 (“[i]n contrast to past trends that saw the outward expansion of urban growth in the region and spillover growth in surrounding regions, Plan Bay Area directs new growth within locally adopted urban growth boundaries to existing communities along major transit corridors”); id. at 104 (“[a]s the plan assumes that all urban growth boundaries/urban limit lines are held fixed through the year 2040, no sprawl-style development is expected to occur on the region’s scenic or agricultural lands. This will help preserve the natural beauty of the Bay Area for future generations to enjoy.”).]In fact, one of the four comprehensive objectives for the proposed land use pattern is to protect the region’s unique natural environment by promoting compact development within PDAs and reducing development pressure on the Bay Area’s open space and agriculture lands. [Footnote 118: Id. at 42, 45.] This preservation of open space, forests, and other carbon sinks in the Bay Area, also, in turn, contributes to the reduction of GHG emissions by removing greenhouse gases from the atmosphere. [Footnote 119: Id. at 123.] Plan Bay Area 2013 “is a work in progress” that is to be updated every four years “to reflect new initiatives and priorities.” [Footnote 120: Id. at 15. See also Memo to Joint MTC Planning Committee with the ABAG Administrative Committee to MTC Deputy Executive Director, Policy / ABAG Executive Director regarding Plan Bay Area 2040 Draft Preferred Land Use Scenario, September 2, 2016, available at <a href="http://planbayarea.org/the-plan/Draft-Preferred-Scenario.html">http://planbayarea.org/the-plan/Draft-Preferred-Scenario.html</a>, attached hereto as Exhibit 18 [ATT 26] at 2 (explaining that ABAG relied on updated regional growth projections in its development of Plan Bay Area 2040: “[t]he Bay Area economy has exploded over the past four years, attracting thousands of new people and jobs. As a result, ABAG adopted a revised regional growth forecast in February 2016. This forecast estimates an additional 1.3 million jobs and 2.4 million people, and therefore the need for approximately 820,000 housing units between 2010 and 2040. This represents an increase of 15 percent in employment and a 25 percent increase in households, related to Plan Bay Area [2013].”).] In May 2016, ABAG and MTC released three alternative land use and transportation scenarios that represent “a progression of plausible regional futures, from more intense housing and employment growth in the urban core (Big Cities Scenario); to more evenly apportioned development among PDAs in medium-sized cities with access to rail services (Connected Neighborhoods); to a more dispersed development pattern, with relatively more growth occurring outside of PDAs (Main Streets Scenario).” [Footnote 121: Plan Bay Area 2040 Memo, supra note 120, at 2 (internal quotation omitted).] Subsequently, ABAG and MTC developed a Draft Preferred Scenario that they finalized and adopted in December 2016. [Footnote 122: See Plan Bay Area 2040 website, Plan Bay Area 2040 Final Preferred Scenario Approved, December 6, 2016, available at <a href="http://planbayarea.org/news/story/PBA-2040-Final-Preferred-Scenario-Approved.html">http://planbayarea.org/news/story/PBA-2040-Final-Preferred-Scenario-Approved.html</a>.] ABAG and MTC expect to adopt Plan Bay Area 2040 by mid-2017. [Footnote 123: Id.]</p>	

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1166	46	<p>[From ATT1:] If the State Water Board were to implement LSJR Alternatives 3 or 4, the SFPUC would not have the water supply needed to accommodate the pattern of growth called for in Plan Bay Area 2013, or the patterns of growth considered in the three scenarios evaluated as part of the process for developing the proposed Plan Bay Area 2040. Specifically, if the State Water Board implemented a 30, 40, or 50-percent unimpaired flow objective on the Tuolumne River, the SFPUC would not be able to reliably serve its existing customers in the RWS [Regional Water System] service territory during protracted drought periods, let alone meet projected future demand for 2040, as forecasted in Plan Bay Area 2013 (and augmented by ABAG for purposes of developing the proposed Plan Bay Area 2040), during a single critically dry year. For example, assuming that San Francisco was responsible for bypassing flow in compliance with a new 40 percent unimpaired flow objective on the Tuolumne River, a reoccurrence of 1987-1992 hydrology, and the level of projected population growth between 2010 and 2040 that is being relied on to develop the proposed Plan Bay Area 2040 by 2035 the population of San Francisco is expected to grow by 34 percent, and employment is projected to increase by 42 percent, although the city's water supply would be reduced by 37 percent (under maximum contract deliveries of 265 mgd). [Footnote 125: 2017 Socioeconomic Impacts Analysis, supra note 46, at 5-6, Tables 3, 4 and 5.] The State Water Board's implementation of a 50 percent unimpaired flow objective on the Tuolumne would further exacerbate the level of shortage, resulting in a water supply reduction of 52 percent. [Footnote 126: Id. at 5, Table 3.] These severe levels of water supply reductions are particularly alarming when considered in the context of the growth projections that correspond to the land use patterns represented by the three scenarios used in the development of Plan Bay Area 2040. Depending on the scenario's underlying assumptions regarding the proposed pattern of growth, San Francisco's population is projected to grow by 40 percent (Main Streets Scenario), 36 percent (Connected Neighborhoods Scenario), or 46 percent (Big Cities). [Footnote 127: Id. at 6, Table 5.] Thus, San Francisco's inability to provide water service to new development increases with the rising estimates of its projected population. This conflict between projected growth in population and reduced water supply reliability in critically dry years manifests throughout the RWS service territory across the Bay Area regardless of whether the analysis assumes concentrated infill development along major transit corridors, proposed in the three Plan Bay Area 2040 scenarios, or simply assumes that growth will occur unbounded by such constraints. [Footnote 128: Id. at 6 (observing that "[t]he apparent mismatch between Bay Area growth projections and expected dryyear shortages raises the question of whether the instream flow restrictions in the SED would alter patterns of growth in the Bay Area.").]</p>	<p>Please see responses to comments 1166-10, 1166-39, and 1166-45.</p>
1166	47	<p>[From ATT1:] It is reasonable to assume that implementation of LSJR Alternatives 3 or 4 would displace the pattern of growth called for in Plan Bay Area. If San Francisco was required to contribute flow, pursuant to its contractual obligations under the Fourth Agreement, to satisfy a 30, 40, or 50-percent unimpaired flow objective on the Tuolumne River, the SFPUC would experience a substantial water supply deficit during sequential-year droughts, i.e., assuming a reoccurrence of 1987-1992 hydrology. Further, in this scenario San Francisco would be unable to meet its projected future water supply demand for 2040, as forecasted in Plan Bay Area 2013 (and augmented by ABAG for purposes of developing the proposed Plan Bay Area 2040), during a single critically dry year, i.e., 1991 hydrology. This would compel San Francisco to significantly reduce deliveries to the RWS [Regional Water System] service territory. Because of San Francisco's cutbacks in deliveries, water suppliers in the RWS service territory with limited access to alternate supplies would face severe water shortages. The high-density, transit-oriented pattern of development called</p>	<p>Please see responses to comments 1166-10, 1166-39, and 1166-45.</p>

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		<p>for in Plan Bay Area 2013 and the three scenarios evaluated for the proposed Plan Bay Area 2040, direct population growth to developed urban areas within the region and thereby amplify these water supply shortages; the same amount of water would need to supply many more people. Due to insufficient water supply, the Bay Area would not be able to absorb the higher level of forecasted growth clustered around major transit corridors, as directed by ABAG and MTC. In response to such water supply constraints, local government agencies in the RWS service territory would likely take actions to protect existing customers and/or to limit unsustainable growth. If water suppliers in the RWS service territory followed EBMUD's example and adopted water neutral programs, the additional compliance costs would increase the price of new homes, thereby reducing affordable housing, and, ultimately, if the costs were too high, displacing development from the Bay Area. Similarly, if water suppliers followed the example of East Palo Alto and adopted development moratoriums due to insufficient water supplies, businesses that would have otherwise located new development in the region would have to go elsewhere. However, notwithstanding these water supply constraints, if local government agencies in the RWS service territory did not take actions to either protect existing customers or limit unsustainable growth, businesses might still seek to locate development outside the Bay Area due to the region's lack of reliable dry-year and future water supplies. If instead of limiting or prohibiting new water connections, water suppliers in the RWS service territory imposed severe--and likely unachievable [Footnote 130: Assuming 1987-1992 hydrology and annual deliveries of 223 mgd, if San Francisco was obligated to bypass water in compliance with a 40-percent unimpaired flow objective on the Tuolumne River, the SFPUC would need to reduce deliveries to the RWS service territory by 39 percent in the first 3 years of the drought, and impose 49-percent reductions in the next 3 years. Further, it would likely be impossible to sustain these extreme levels of water supply rationing, although during the 1987-1992 drought the SFPUC's mandatory rationing program reduced demand by approximately 30 percent as compared to pre-drought deliveries, the ability of the SFPUC's retail customers to achieve a 25-percent or greater reduction in the future "is highly unlikely due to the 'hardening' of water demands that occurred during and subsequent to the drought." (SFPUC 2015 UWMP, supra note 5, Appendix K, at 3.)]--levels of mandatory rationing to maintain water service during sequential-year droughts and to meet projected future demand, the Bay Area's economy would be dramatically impacted. Faced with the option of locating new development in an area with more reliable dry-year and future water supplies, it is reasonable to assume businesses would "see the writing on the wall" and migrate away from the Bay Area, thereby displacing the pattern of planned growth in the region's urban core called for by ABAG and MTC.</p>	
1166	48	<p>[From ATT1:] The SED fails to acknowledge the inconsistency between the State Water Board's implementation of LSJR Alternatives 3 or 4 and Plan Bay Area 2013 and other State plans designed to avoid adverse environmental effects. The EIR must discuss any inconsistencies between the proposed project and regional plans, including "the applicable air quality attainment or maintenance plan or State Implementation Plan . . . regional transportation plans, regional housing allocation plans, regional blueprint plans, plans for the reduction of greenhouse gas emissions, habitat conservation plans, natural community conservation plans and regional land use plans for the protection of . . . San Francisco Bay . . ." (Cal. Code Regs., tit. 14, § 15125(d); see also Appendix G of the CEQA Guidelines [requiring that the lead agency must identify any "[c]onflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project . . . adopted for the purpose of avoiding or mitigating an environmental effect."].) [Footnote 131: See CEQA Environmental Checklist Form, Appendix G, IX(b), available at</p>	<p>Please see responses to comments 1166-10, 1166-39, and 1166-45. For the reasons identified in those responses and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that are inconsistent with the Plan Bay Area or other plans identified in the comment.</p>

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		<p><a href="http://resources.ca.gov/ceqa/guidelines/Appendix_G.html">http://resources.ca.gov/ceqa/guidelines/Appendix_G.html</a>.) Plan Bay Area 2013 is the Bay Area’s first regional plan subject to SB 375, and thus, is designed to meet the legislation’s goals by primarily directing future growth into urban infill developments located along major transit corridors. [Footnote 132: Plan Bay Area 2013 [ATT25], at 4, 123.] By concentrating development in existing urban areas that are easily accessible to transit, Plan Bay Area 2013 would substantially reduce vehicle miles travelled as compared to suburban development, accommodate demand for new housing in the urban core, and reduce development pressure on undeveloped and agricultural lands, thereby helping to meet the Bay Area’s statutorily required per capita GHG emissions reductions and housing targets, and preserving open space, forests and agriculture. [Footnote 133: Id. at 4-5, 103-104, 123.] The SED fails to analyze, or even acknowledge, that the State Water Board’s implementation of LSJR Alternatives 3 or 4 will have the reasonably foreseeable effect of frustrating the legislative goals supporting Plan Bay Area 2013, including the mandatory targets for reduction of GHG emissions and housing projected population growth within the region, by displacing the denser, transit-oriented pattern of development called for by ABAG and MTC. [Footnote 134: Id. at 5.] Additionally, the more expansive, sprawling pattern of growth would also contravene Plan Bay Area 2013’s comprehensive objective to conserve existing open space, natural resources and agriculture in the region. [Footnote 135: See Plan Bay Area 2013 at 103 ("SB 375 requires consideration of open space and natural resource protection and supports accommodating new housing and commercial development within existing areas designated for urban growth. This is of particular importance to the Bay Area, where so much of the region’s spectacular natural setting has been preserved as open space.".)] The SED must acknowledge, discuss and reconcile these inconsistencies.</p>	
1166	49	<p>[From ATT1:] The SED fails to assess the significant environmental impacts that would result if the pattern of growth called for in Plan Bay Area 2013, and posited in the three scenarios used to develop the proposed Plan Bay Area 2040, was displaced. Such displacement would occur under the reasonably foreseeable events in which local governments limit growth due to insufficient water supply and business leaders decide to locate new development in areas with more reliable dry-year and future water supplies. This critical omission constitutes an abuse of discretion because the SED fails to present any analysis whatsoever regarding such impacts. (Pub. Res. Code, § 21168.5; Pub. Res. Code, § 21100(b)(1) ; Pub. Res. Code, § 21159(a)(1); Cal. Code Regs., tit. 23, § 3777(b)(2).) Further, the draft’s failure to analyze how the State Water Board’s implementation of a new unimpaired flow objective on the Tuolumne River may affect growth in the Bay Area also violates the requirements of the State Water Board’s certified regulatory program by failing to analyze the environmental impacts of the reasonable foreseeable method of compliance of reduction in deliveries throughout the RWS service territory, taking into account impacts to "population and geographic areas," (Cal. Code Regs, tit. 23, § 3777(c); Pub. Res. Code, § 21159(c)-d.) In addition, the SED’s failure to analyze the reasonably foreseeable displacement of growth violates the Porter-Cologne Act by failing to analyze the "past, present, and probable future beneficial uses of water," (Wat. Code, § 13241), a category that expressly includes municipal water supply, (Wat. Code, § 13050(f)).</p>	<p>Please see responses to comments 1166-10, 1166-39, and 1166-45. For the reasons identified in those responses and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that are inconsistent with the Plan Bay Area or other plans identified in the comment, particularly given that water supply is not the only limiting factor to growth in San Francisco and the Bay Area. A wide variety of factors influence growth and urban development within the plan area and within the City and County of San Francisco service area, one of which may be water supply. These factors result in a complex relationship to influence growth, development, and urbanization in an area. As such, it would be speculative to assume that growth would be limited solely as a result of water supply because other factors such as availability of employment opportunities and development costs, could also dictate and limit where growth would or would not occur. Therefore, it would also be speculative to assume the extent and locations of any displaced growth associated with the plan amendments and any potential environmental impacts.</p>
1166	50	<p>[From ATT1:] Greenhouse Gas Emissions and Other Air Pollutants. The State Water Board, as the lead agency, "should attempt to describe, calculate, or estimate, the amount of greenhouse gases the project will emit." (Center for Biological Diversity 62 Cal.4th at 217 (citing Cal. Code Regs., tit. 14, § 15064.4(a).) Significantly, "Bay Area ecosystems, especially forests and wetlands, are very efficient at storing carbon." [Footnote 136: Greenbelt Alliance 2017 [ATT 21] at 28.] If the Bay Area’s at-risk landscapes are developed, "the carbon</p>	<p>Please see responses to comments 1166-10, 1166-39, and 1166-45. For the reasons identified in those responses and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that would in turn result in increases in GHG emissions and other air quality impacts. Please also see Master Response 6.1, Cumulative Analysis, regarding growth inducing effects and housing factors. Furthermore, as discussed in Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System; and Master Response 8.4, Non-</p>

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		<p>that would be released is equivalent to putting 1.3 million cars on the road every year." [Footnote 137: Id. (citation omitted).] In addition to reconciling the aforementioned inconsistency with the GHG emissions reductions targets mandated by SB 375 and incorporated into Plan Bay Area 2013, the State Water Board is also tasked with attempting to 'describe, calculate, or estimate' the increased amount of GHG emissions that will result from displacement of the high-density, transit-oriented pattern of growth called for by ABAG and MTC, and the corresponding loss of carbon sinks throughout the region due to the encroachment of sprawling development on existing opens spaces and forests. The SED fails to include any analysis of the reasonably foreseeable increase in GHG emissions that will result from displacement of growth in the urban core in the Bay Area if San Francisco is responsible for bypassing flow in compliance with LSJR Alternatives 3 or 4. In addition, the SED fails to consider other air quality impacts that are likely to occur in the event that growth is displaced. The SED concludes: "It is not expected that the flow requirements would result in population or employment growth that would result in a conflict with or obstruct implementation of the applicable air quality plan because they would not require activities associated with population growth (e.g., housing development, business centers, etc.). Consequently, [air quality] impacts would be less than significant." (SED, at B-20.) However, the SED's conclusion fails to consider the air quality impacts that may result if growth is displaced from the Bay Area. For example, growth from the Bay Area displaced to the Central Valley would result in an increase in air pollution in the San Joaquin Air Basin from increased development and traffic. The San Joaquin Air Basin already experiences some of the worst air quality in California. [Footnote 138: See Summary of California Air Resources Board Select 8 Summary, accessed March 9, 2017, attached hereto as Exhibit 19 [ATT27].] Although the SED recognizes that a project is considered inconsistent with air quality plans if it would result in growth and a consequent increase in emissions that are not accounted for "in the applicable air quality plan emissions budget," [Footnote 139: SED, at B-20 (explaining that "a project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates included in the applicable air quality plan, which, in turn, would generate emissions not accounted for in the applicable air quality plan emissions budget.") the analysis fails to assess the degradation of air quality that can be expected if growth from the Bay Area is displaced to an outlying region such as the Central Valley. [Footnote 140: See e.g., SED, at 11-12 (wherein the SED acknowledges there is existing pressure to develop affordable residential housing on agricultural land in the Central Valley to accommodate workers who live in the Central Valley yet commute to the Bay Area).]</p>	<p>Agricultural Economic Considerations, water supply is not the only factor in determining a change in rates of urbanization or the specific locations of housing, businesses, and development within the peninsula and outside of the peninsula. As discussed in these master responses, various factors result in a complex relationship to influence growth, development, and urbanization in an area. Land use patterns are dependent upon a myriad of factors, including land costs, construction costs, proximity to existing development and infrastructure, transportation networks, employment and socioeconomic conditions, and government regulations and land use policies. Water supply is one factor affecting development, but certainly not the driving force in the Bay Area, where a robust job market, high quality of life, and pleasant climate combine to stimulate continued population growth, economic growth, and thus land development. As such, it would be speculative to assume with a degree of certainty that growth would be displaced solely as a result of water supply because other factors, such as availability of employment opportunities and development costs, could also dictate and limit where growth would or would not occur. Therefore, it would also be speculative to assume the extent and locations of any displaced growth associated with the plan amendments and associated changes in emissions. The effects of the plan amendments on land use changes and resultant carbon storage and sequestration by forests and wetlands is speculative. In particular, key variables, including carbon cycling, methane production, and nitrogen cycling vary by land use type, season, and site-specific chemical and biological characteristics. Depending on these conditions, any land use change may result in a net increase or decrease in GHG emissions. Additional information related to acreage by land use type, site-specific land characteristics (e.g., salinity, pH, age of trees, type of grass, carbon content of soils), and fuel consumption data would be required to estimate the net difference in emissions between the removal and addition of GHGs into the atmosphere (i.e., GHG flux). Without local sampling and monitoring data, these values are unknown. An analysis of potential GHG emissions from land use changes that could result from the plan amendments is not possible. Similarly, any attempt at assessing air quality impacts based on displaced growth would be based on speculation. Such speculation is not an appropriate basis for concluding that the project is inconsistent with air quality or other plans.</p>
1166	51	<p>[From ATT1:] Loss of Open Space, Forests, Habitat and Agriculture. Under CEQA, the lead agency must analyze potentially significant adverse environmental effects resulting from loss of open space, forests, habitat and agriculture. (See e.g., Pub. Res. Code, § 21100(b)(1) ; see also Appendix G of the CEQA Guidelines [requiring lead agency to identify potentially significant adverse environmental effects resulting from conversion of farmland to non-agriculture use.]) [Footnote 141: See CEQA Environmental Checklist Form, Appendix G, II(a), available at <a href="http://resources.ca.gov/ceqa/guidelines/Appendix_G.html">http://resources.ca.gov/ceqa/guidelines/Appendix_G.html</a>.] One of the four comprehensive objectives of Plan Bay Area 2013 is to conserve open space, natural resources and agriculture lands in the region by concentrating new development in existing urban areas and locally adopted urban growth boundaries. [Footnote 142: Plan Bay Area 2013 [ATT25] at 42, 45.] To this end, Plan Bay Area 2013 identifies "over 100 regionally significant open spaces about which there exists broad consensus for long-term protection but which face nearer-term development pressures." [Footnote 143: Id. at 45.] As explained by ABAG and MTC, past development trends saw the outward expansion of growth within</p>	<p>Please see response to comment 1166-50. For the reasons identified in that response and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that would in turn result in loss of open space, forests, habit and agriculture. Furthermore, changes to adopted land use plans are not proposed in response to implementation of the plan amendments. Any loss of open space, forests, or agriculture would still remain under the jurisdiction of the controlling land use or resource agency.</p>

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		<p>the Bay Area and spillover of growth into surrounding regions. [Footnote 144: Id.] At present, 293,100 acres of natural and agricultural lands in the Bay Area "are at risk of sprawl development over the next 30 years. . . . The total land at risk is about 458 square miles, nearly 10 times the size of San Francisco." [Footnote 145: Greenbelt Alliance 2017 [ATT 21] at 3.] "The speculative pressure is acute, with 63,500 acres of Bay Area land at high risk of development within the next years," most of which is located "just outside cities." [Footnote 146: Id. at 8.] If the high-density, transit-oriented pattern of growth called for in Plan Bay Area 2013 is displaced, the "acute" pressure to develop existing open spaces in the region, including habitat of threatened and endangered species and agricultural lands, will inevitably intensify. [Footnote 147: Id. at 27 (noting that the "Bay Area has a total of 2.3 million acres of agricultural land, 1.8 million acres of lands that provide water resources--watersheds and wetlands--and 2.5 million acres of lands that are important for wildlife--habitat corridors, and areas rich in biodiversity.".)] For example, Contra Costa County has the most at risk land in any county in the region, 62,000 acres, that includes 41 percent of the "Bay Area's at-risk Critical Habitat lands." [Footnote 148: Id. at 13.] "The future of many of the region's remaining burrowing owls, kit foxes, and other rare species depends on the county's growth decisions." [Footnote 149: Id.] Another illustration of this pressure is evident in Santa Clara County, where 56 percent of the county's existing farmland is at risk of development. [Footnote 150: Id. at 20 (explaining, "[f]armland in Santa Clara County desperately needs conservation. With an astounding 56 percent of the county's farmland at risk of development, this fertile and irreplaceable resource is very close to being lost forever.".)] See also SED, at 11-12 (wherein the SED explains that the pressure to develop residential housing on agricultural land in the Central Valley is, in part, driven by workers who live in the Central Valley yet commute to the Bay Area). However, the SED fails to acknowledge that agricultural land within the Bay Area, e.g., in Santa Clara County, is also at risk of urbanization.] The SED fails to include any analysis of the reasonably foreseeable loss of open space, forests, habitat and agriculture that will result from displacement of growth in the urban core in the Bay Area assuming San Francisco is responsible for bypassing flow in compliance with LSJR Alternatives 3 or 4.</p>	
1166	52	<p>[From ATT1:] Water-Related Impacts of Bringing Sprawling Development into Affected Areas. Under CEQA, "[t]he EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected." (Cal. Code Regs., tit. 14, § 15126.2.) To the extent that new development is displaced to outer regions of the Bay Area and the Central Valley, it is reasonable to assume there would be adverse environmental impacts, including impacts to groundwater recharge, water quality and heightened risks of erosion and flooding. For example, development displaced to currently rural areas in the outer Bay Area or Central Valley, and the attendant construction, would increase the presence of impermeable surfaces, which would, in turn, impede and reduce groundwater recharge. [Footnote 151: Greenbelt Alliance 2017 [ATT21] at 28 ("[u]ndeveloped Bay Area lands catch and filter rain, replenishing groundwater supplies. But this service is threatened by development; if lands are paved over, they cannot collect water.".)] This is a critical issue in counties like Sonoma, "where groundwater is what people drink." [Footnote 152: Id.] More than half of Sonoma County's water supply--used for both drinking and irrigation--comes from groundwater. [Footnote 153: Id. at 24.] In Sonoma County, 58,400 acres of land are at risk of development over the next 30 years, including land that collects water relied on to recharge Sonoma County's groundwater supplies. [Footnote 154: Id. (emphasizing that protecting this land from development "is essential, for water and for the people who depend on it.".)] "If the region's at-risk landscapes are lost to sprawl development, 46 billion gallons of water--a year's worth of water for 677,000</p>	<p>Please see response to comment 1166-50. For the reasons identified in that response and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that would in turn result in water-related impacts.</p>

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		households--is at stake." [Footnote 155: Id. (citations omitted).]	
1166	53	<p>[From ATT1:] The increase in impermeable surfaces associated with development, such as roads and parking lots, increases stormwater runoff, which, in turn, "picks up lawn fertilizer and pesticides, pet waste, trash, pollution from vehicles and pavement materials, and chemicals from industrial and commercial activities." [Footnote 156: Our Built and Natural Environments: A Technical Review of the Interactions Among Land Use, Transportation, and Environmental Quality, Second Edition, U.S. Environmental Protection Agency, June 2013, available at <a href="https://www.epa.gov/sites/production/files/2014-03/documents/our-built-and-natural-environments.pdf">https://www.epa.gov/sites/production/files/2014-03/documents/our-built-and-natural-environments.pdf</a>], at 51. San Francisco incorporates EPA's Technical Review by reference herein.] Unless stormwater is treated or soaks into the ground, it will transport the pollutants that it has picked up into a nearby local water body. [Footnote 157: Id.] The transference of heat from impervious surfaces in the urban environment to stormwater runoff also degrades water quality by increasing the temperatures of local water bodies. The increased speed of flowing stormwater is also problematic; augmented stormwater runoff in developed areas "moves faster, reaches peak flow more quickly after precipitation begins, and flows for a longer period of time, all of which increase erosion and flood risk." [Footnote 158: Id.] Moreover, increased stormwater runoff increases the frequency and severity of flooding during wet periods because water that would have otherwise soaked into the ground is unable to infiltrate the new, impervious surfaces. [Footnote 159: Id. at 48.] The SED must analyze all of these impacts. Additionally, as the RWS [Regional Water System] service territory has some of the lowest per capita water use in the state, it is reasonable to conclude that development displaced from the Bay Area to other regions, such as the Central Valley, will use more water per capita than if that development occurred in the urban core areas, as called for in Plan Bay Area 2013. [Footnote 160: See e.g., California Department of Water Resources, California Water Plan Update 2013, Volume 2 Regional Reports, San Francisco Bay Hydrologic Region, 2013, available at <a href="http://www.water.ca.gov/waterplan/cwpu2013/final/">http://www.water.ca.gov/waterplan/cwpu2013/final/</a> at SFB-40 (explaining that the cool climate, small lot sizes, and high-density development in the Bay Area contribute to low per capita urban water use, whereas per capita water use in communities in the warmer Central Valley can range from 200 to 300 gallons per day). San Francisco incorporates the California Water Plan Update 2013 by reference herein.]</p>	<p>Please see response to comment 1166-50. For the reason identified in that response and the master responses referenced therein, it is speculative to assume that the plan amendments will ultimately result in displaced growth patterns that would in turn result in water-related impacts.</p> <p>Furthermore, it is speculative to assume with any degree of certainty how potential water rationing and water use restrictions would affect displacement from the Bay-Area and RWS service area to other parts of California, and subsequently, the conversion of permeable surfaces to impermeable surfaces. In addition, because it is speculative to assume with any degree of certainty how potential water rationing and water use restrictions would affect displacement of development from the Bay-Area and SFPUC RWS service area to other parts of California, it is further speculative to analyze changes in per capita water use as a result of such displacement.</p>
1166	54	<p>[From ATT1:] The SED fails to consider the potential adverse impact of the State Water Board's proposal on the development of housing within the Bay Area. Water Code Section 13241 "identifies certain factors that must be evaluated when establishing water quality objectives," (SED, at ES-63), including "the need for developing housing within the region," (Wat. Code, § 13241(e)). Although the SED indicates that the required discussion of the "[n]eed for developing housing within the region" primarily appears in the Executive Summary, (SED, at ES-64), in fact, there is no substantive discussion of how the State Water Board's proposal may affect development of new housing in the Executive Summary or anywhere else in the document. Instead, the discussion of housing effects in the Executive Summary, and scattered throughout various sections of the SED, with very limited exceptions, denies that the State Water Board's proposal will have any appreciable effect on the development of new housing in the plan area, extended plan area, or other potentially impacted areas, including San Francisco and the RWS service territory. [Footnote 161: See ES-5-ES-6 (defining the boundaries of the plan area and extended plan area, and explaining that "the plan amendments also have the potential to affect areas outside of the plan area or extended plan area that obtain beneficial use of water from the Stanislaus, Tuolumne, and Merced Rivers, and the LSJR downstream of the Merced River, but are not contiguous</p>	<p>Please see response to comment 1166-50 regarding factors affecting growth and urban development. Refer to Master Response 1.2, Water Quality Control Planning Process, for information regarding Water Code section 13241. Also, please see response to comment 1166-45 regarding Plan Bay Area.</p>



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		<p>with the plan area or extended plan area," including San Francisco and "[a]ny other area served by water delivered from the plan area or extended plan area not otherwise listed above").]The Executive Summary states: "The proposed flow and salinity objectives do not directly restrict the development of housing in the plan area and the extended plan area. Also, as explained in Chapter 17, Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources, of this SED would not induce growth and new housing development. Depending on the alternative, however, the flow objectives could result in reduced surface and groundwater supplies such that additional infrastructure to treat or provide alternative sources of water may need to be constructed, as explained in Chapter 13, Service Providers. Where alternative sources are not provided, it may affect new housing development because there may be insufficient supplies to serve the development." (SED, at ES-65.)Thus, the SED avoids any substantive discussion of how the State Water Board's proposal may affect new housing development within the affected regions, including the Bay Area, in the same way the analysis leapfrogs over an inconvenient discussion of impacts that would result from draconian reductions in water deliveries to the RWS service territory. Instead of acknowledging that an inability to develop needed housing in the Bay Area is a reasonably foreseeable consequence of the State Water Board's implementation of a new unimpaired flow objective on the Tuolumne River, as proposed in the SED, the draft posits that only the failure of service providers to develop adequate alternative water supplies will result in the reduced development of new housing. [Footnote 162: If San Francisco was responsible for bypassing flow in compliance with the State Water Board's implementation of LSJR Alternatives 3 or 4, it would be required to impose unsustainable levels of mandatory rationing throughout the RWS service territory during sequential-year droughts.] Further, although the SED concludes that because "[u]nder the LSJR alternatives, changes in river flows would generally result in more water remaining in the three eastside tributaries rather than being used for consumptive purposes," such "changes in river flows would not increase the reliable water supply and would not directly or indirectly induce economic, population, or housing growth," (SED, at 17-69), the draft entirely fail to address the potential correlative increases in economic, population, and housing growth that may therefore occur elsewhere, i.e., in other regions with more reliable dry-year and future water supplies. Plan Bay Area 2013 is designed to comply with SB 375's statutory requirement that the Bay Area house 100 percent of its projected population growth without displacing current low-income residents. [Footnote 163: Plan Bay Area 2013 [ATT 25] at 5, 19, 43.] As a reflection of Plan Bay Area 2013's "emphasis on the existing transit network and connecting homes and jobs, San Francisco, San Mateo, Santa Clara and Alameda counties account for the majority of housing growth (77 percent) and job growth (76 percent)." [Footnote 164: Id. at 56.] The SFPUC delivers water in each of these counties. If the SFPUC was responsible for bypassing flow to meet LSJR Alternatives 3 or 4, during sequential-year droughts it would be compelled to significantly reduce deliveries to its in-city retail customers and wholesale customers located in San Mateo, Santa Clara, and Alameda counties. For all of the reasons discussed above, it is reasonable to assume this lack of dry-year and future water supply reliability would inhibit and deter needed housing growth in the Bay Area, and would induce growth in areas with more reliable dry-year and future water supplies. The SED's utter failure to even acknowledge, let alone comprehensively analyze, how the State Water Board's implementation of LSJR Alternatives 3 or 4 may displace the pattern of compact growth called for in Plan Bay Area 2013, and thereby, further intensify the pressure to develop affordable housing elsewhere, violates the express requirement of Water Code Section 13241(e).</p>	

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1166	55	<p>[From ATT1:] Reduced hydropower generation would result in substantial economic impacts to San Francisco. The SED fails to consider impacts to the SFPUC's hydropower operations from implementation of the LSJR Alternatives. The SED relies on the water supply effects ("WSE") model to estimate the effects of the LSJR Alternatives on hydropower generation at certain dams. (SED, at J-1 ["This analysis relies on the State Water Resources Control Board's (State Water Board's) water supply effects (WSE) model to estimate the effects of the LSJR alternatives on reservoir releases and storage (elevation head), and allowable diversions to off-stream generation facilities, and then calculates the associated change in monthly and annual energy production. This output then provides input to electric grid reliability modeling, which evaluates the potential impacts of these changes on the electric grid reliability under peak load and outage contingency scenarios."].) The SED focused its analysis of estimated impacts to hydropower operations on three identified "rim dams," i.e., New Melones Dam on the Stanislaus River, New Don Pedro Dam on the Tuolumne River, and New Exchequer Dam on the Merced River. (SED, at J-1. ["Numerous hydropower generation facilities on the three eastside tributaries are evaluated in this analysis. The major facilities potentially affected, however, are those associated with the New Melones Reservoir (New Melones Dam) on the Stanislaus River, New Don Pedro Reservoir (New Don Pedro Dam) on the Tuolumne River, and Lake McClure (New Exchequer Dam) on the Merced River."]; SED, at J-1, fn. 4 ["In this document, the term rim dams is used when referencing the three major dams and reservoirs on each of the eastside tributaries: New Melones Dam and Reservoir on the Stanislaus River; New Don Pedro Dam and Reservoir on the Tuolumne River; and New Exchequer Dam and Lake McClure on the Merced River."].) Significantly, hydropower facilities located upstream of these three "rim dams," e.g., the SFPUC's hydropower facilities located above New Don Pedro Dam on the Tuolumne River, were not included in the WSE model. (SED, at J-5 ["Hydropower generated from facilities upstream of the rim dams on the Stanislaus and Tuolumne Rivers is not included in the WSE model because the largest hydrologic effects in terms of volume of water will be at and downstream of the rim dams."].) The SED states that "[u]pstream hydropower effects are qualitatively discussed in Chapter 14, Energy and Greenhouse Gases, in Section 14.4.4, Impacts and Mitigation Measures: Extended Plan Area." (SED, at J-5.) However, to the extent that the general qualitative discussion of impacts to hydropower operations upstream of the three identified "rim dams" that appears in Chapter 14 is intended to apply to the SFPUC's hydropower facilities on the Tuolumne river, that discussion is woefully inadequate because it ignores a critical component of San Francisco's operations during sequential-year droughts. To extend the longevity of its water supply, during a protracted drought San Francisco would impose mandatory rationing and reduce deliveries to the RWS service territory from the San Joaquin Pipelines. [Footnote 165: SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 5.] This would enable San Francisco to maximize the amount of water that could be stored in its three largest reservoirs on the Tuolumne River and its tributaries--Hetch Hetchy Reservoir, Cherry Reservoir and Lake Eleanor. [Footnote 166: See WSIP at 2-7 (explaining that "[w]ater from Lake Eleanor and Lake Lloyd [also known as Cherry Reservoir] is used primarily to meet minimum instream flow requirements to benefit fish and other wildlife, satisfy downstream water rights of the Turlock and Modesto Irrigation Districts . . . produce hydroelectric power, and provide flows to support recreational use including whitewater recreation. However, if necessary during emergency or drought conditions, water from Lake Lloyd or Lake Eleanor can be released to Cherry Creek and then diverted to Mountain Tunnel for transport to the Bay Area, which occurred once during the early 1990s."].) However, because San Francisco generates electricity when it releases water from Hetch Hetchy Reservoir for delivery to the Bay Area, primarily via Canyon Power Tunnel and Kirkwood Powerhouse, rationing the delivery of water supply to</p>	<p>Hydropower generation in the extended plan area was considered in Chapter 14, Energy and Greenhouse Gases, in the Extended Plan Area impact section, and potential hydropower impacts were considered to be significant. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies and CCSF hydropower generation in the extended plan area.</p>

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		<p>the RWS results in reduced hydropower generation. [Footnote 167: SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 5.] In its qualitative discussion of impacts to hydropower facilities upstream of the three identified "rim dams," the SED fails to consider that reductions in hydropower generation may occur due to reduced water deliveries. Although the SED recognize that "[h]ydropower production is related to both water discharge volume and reservoir head," (SED, at 14-53), the qualitative discussion of impacts to hydropower facilities upstream of the "rim dams" in Chapter 14 solely focuses on reductions in generation associated with reduced reservoir volume, and consequent reductions in reservoir head. (SED, at 14- 53 [concluding that during drought conditions "there could be significant hydropower production reductions at reservoirs under [LSJR Alternatives 2, 3, and 4] in the extended plan area" due to more frequent and severe reservoir volume reductions.].) Accordingly, the SED fails to analyze, qualitatively discuss, or even acknowledge the hydropower reductions that San Francisco would experience during sequential-year droughts under implementation of LSJR Alternatives 2, 3, or 4. [Footnote 168: In fact, it appears the reference to a qualitative discussion of effects to hydropower operations upstream of the three "rim dams" in Chapter 14 was primarily intended to allay concern that impacts to upstream hydropower operations, such as the SFPUC's hydropower facilities in the Tuolumne River Watershed, were simply not considered by the State Water Board. See Declaration of Jonathan P. Knapp in Support of Comments by the City and County of San Francisco to the Draft Substitute Environmental Document in Support of Potential Changes to the Bay-Delta Plan ("Knapp Decl."), attached hereto as Appendix 4 [ATT6], at ¶ 8, see Attachment 2 [ATT6:ATT2:ATT1] to Knapp Decl., E-mail from Nicole L. Williams, Senior Environmental Planner, ICF International, to William Anderson and Timothy Nelson, State Water Board, August 15, 2016 (explaining that "[w]e will edit the text in Appendix J to remove that reservoirs/dams upstream of the rim dams would be unaffected by the LSJR alternatives and to reflect that given the relatively small amount of hydropower generated upstream when compared to the rim dams (Table J-1) ) this information was not modeled and Appendix J only focuses on modeling changes associated with the rim dams. In addition, we could add a sentence that says the upstream hydropower effects are qualitatively discussed in the EPA section of Chapter 14 (so people don't think we've left it out).".)]</p>	
1166	56	<p>[From ATT1:] The SFPUC's hydropower operations would be significantly affected by implementation of LSJR Alternatives 3 or 4 during dry hydrologic conditions. If San Francisco was responsible for complying with a new unimpaired flow objective on the Tuolumne River, then during dry hydrologic conditions the SFPUC would be compelled to implement water supply rationing in order to preserve system storage. Consequently, less water would flow through the SFPUC's water supply delivery pipeline, thereby reducing hydropower generation at facilities situated along the route of the delivery pipeline, i.e., Kirkwood Powerhouse and Moccasin Powerhouse. [Footnote 169: SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 5.] For example, assuming maximum annual contract deliveries of 265 mgd, the SFPUC's hydropower generation could be reduced by as much as 11 percent under a 40 percent unimpaired flow objective (assuming FY 1960-61 through FY 1962-63 hydrology), and by as much as 21 percent under a 50 percent unimpaired objective (assuming FY 1976-77 through FY 1977-78 hydrology). [Footnote 170: Id. at 13, Table 5.] Assuming pre-drought demand of 223 mgd, the SFPUC would experience comparably significant reductions in hydropower generation. [Footnote 171: Id. at 14, Table 6.]</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of hydrologic changes including a discussion of hydropower with implementation of the plan amendments.</p>
1166	57	<p>[From ATT1:] The SFPUC's hydropower impacts would result in significant economic impacts that have not been analyzed in the SED. San Francisco estimates that the economic impact</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional</p>

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		<p>of the State Water Board’s implementation of a 40 to 50-percent unimpaired flow objective on the Tuolumne River--calculated by determining the foregone revenue as a result of lost sales of hydropower--would be approximately \$2 million per year for each successive year of a protracted drought. [Footnote 172: SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 6.]</p>	<p>Water System, regarding the economics of CCSF hydropower generation in the extended plan area.</p>
1166	58	<p>[From ATT1:] The State Water Board’s conclusion that it is reasonably foreseeable that San Francisco could develop and/or procure sufficient replacement water supplies through the three methods of compliance identified in the SED is not supported by substantial evidence, or reasonable inferences predicated on fact. [Footnote 173: SED, at L-22 (identifying three "potential actions SFPUC could take to replace reductions in water supply resulting under the LSJR alternatives" as "Water transfer," "In-Delta diversion(s)," and "Water supply Desalination Project.")].] The State Water Board’s assumption that it is reasonably foreseeable that San Francisco would be able to purchase the requisite volume of replacement water from the Modesto Irrigation District and the Turlock Irrigation District is not supported by substantial evidence, or reasonable inferences predicated on fact, and the analysis of environmental and economic impacts associated with such water transfers is inadequate. Although the SED assumes that San Francisco’s primary method of compliance with a new flow objective for the Tuolumne River would be to purchase replacement water from the Districts, the draft concedes that whether such a transfer would actually occur is "uncertain," "speculative and unknowable." (SED, at L-20, [noting that in 2012, the MID Board of Directors rejected a proposal for long-term transfers to SFPUC. "This rejection makes future temporary drought transfers uncertain."]; id. at 16-9 [acknowledging that "[t]he number and location of surface water transfers that entities would undertake in response to surface water reductions as a result of approving the LSJR alternatives is speculative and unknowable."]; id. at L-22 ["[a] possible water transfer between SFPUC and irrigation districts relies on numerous unknown variables (e.g., willingness of irrigation districts to enter into a transfer agreement, the price of the water, and the volume of water needed)."]; id. at 20-27 [describing "uncertainties of this type of water transfer" as including "price of water, quantity of water available, willingness of parties to enter into an agreement."].) [Footnote 174: Id. at L-26 ("[i]t is reasonable to assume that SFPUC would purchase and transfer additional water supplies from the Tuolumne River Watershed to its service area to offset water shortages during drought periods."]; id. at 20-27 "[t]he analysis presented in this section (and described in greater detail in Appendix L, City and County of San Francisco Analyses) assumes that under LSJR Alternatives 2, 3, and 4, during drought periods, SFPUC could meet its potential water supply shortage by buying water from MID and TID."; id. at 20-38 ("To assess the effects of additional water supply costs on the four-county Bay Area regional economy, it is assumed that the SFPUC would meet its water demands during severe drought periods (such as within the 6-year drought 1987-1992) by purchasing water from MID and TID."].)The State Water Board has failed to identify any substantial evidence in support of its assumption that San Francisco would be able to effectuate such a transfer. (Pub. Res. Code, § 21168.5 [providing that under CEQA "[a]buse of discretion is established if the agency has not proceeded in a manner required by law or if the determination or decision is not supported by substantial evidence."].) Thus, the proposed large-scale water transfer from the Districts to San Francisco cannot be considered a reasonably foreseeable method of compliance by San Francisco with the LSJR Alternatives. (Pub. Res. Code, § 21159(a); Cal. Code Regs., tit. 23, § 3777(b)(4).)</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a discussion of the feasibility of water transfers to help meet water supply demands if surface water supplies are reduced.</p>
1166	59	<p>[From ATT1:] The State Water Board has no basis for assuming that the Districts would agree to transfer the requisite volume of water to San Francisco in the midst of a sequential-</p>	<p>Please see response to comment 1166-58.</p>

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		<p>year drought. The State Water Board reaches an unsupported conclusion about past water transfers and provides no support for a water transfer between the Districts and San Francisco of the required magnitude. Contrary to the suggestion in the SED, MID only transferred a minimal amount of water to San Francisco during the 1987-1992 drought. The SED estimates that if the State Water Board implemented a 40 percent unimpaired flow objective on the Tuolumne River, and San Francisco was responsible under the Fourth Agreement for providing approximately 51.7 percent of the increased flow required from the Districts, San Francisco would experience a water supply deficit of 119,000 AF/year for 6 consecutive years based on the historic hydrology from the 1987-1992 drought. [Footnote 175: In fact, San Francisco's deficit under a 40-percent unimpaired flow objective would be 129,884 AF/year for each of the 6 years, resulting in an additional loss of 10,884 AF/year, or 65,304 AF in total for the 6-year period. See SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 16, Table 9. (SED, at L-21, Table L.4-2). The Districts have never transferred this volume of water to any other entity. The SED relies on the faulty premise that San Francisco purchased a comparable volume of water from the Districts during the 1987-1992 drought. [Footnote 176: December 12th Workshop Transcript [ATT13] at 207:4-12 (wherein Tom Wegge, Principal Economist at TCW Economics explained, "[w]ell, I mean, we considered all of the options [for replacement water supply for San Francisco], but we felt that the most reasonable assumption, given the existing infrastructure, the history of having transfers, the fact that the district--the SFPUC--has identified transfers between MID and TID [in] their water supply plan, that based on those factors and the fact that, like I said, the infrastructure was in place, that seemed like the most reasonable assumption for purposes of analysis."); id. at 2018:21-25-209:1 (wherein Will Anderson, Water Resources Engineer with the Division of Water Rights, explains that "the record includes examples of the city pursuing such sales and don't in fact [know] the details of what has actually occurred in the past but that it would certainly be something that would be possible."); id. at 208:18-25-209:1-9 (wherein Mr. Anderson acknowledges that State Water Board Staff generated the assumption that San Francisco would be able to purchase the requisite replacement supply from the Districts that served as the starting point for Mr. Wegge's economic analysis.)]The SED appears to conclude that San Francisco purchased, on average, 18,000 AF/year from the Districts during the 6-year drought of 1987-1992. The SED estimates that "[u]nder historic conditions the maximum amount of water needed to be purchased by the City to make it through the 6-year drought was about 105 [thousand acre-feet or "TAF"], or an average of 18 TAF per year for the 6-year period (1987-1992)." (Id. at L- 14.) Further, the SED states that the baseline credit balance in San Francisco's water bank in Don Pedro Reservoir that was used by the State Water Board in its analysis "is lower than historically reported because, during [the 1987-1992 drought], the account dropped below zero and the City purchased water from the districts. The details of this purchase agreement between the City and the districts during this period are unknown, but the difference from baseline and the reported balance can be attributed to this purchase." (Id.) However, the SED is mistaken; San Francisco has never purchased a comparable volume of water from the Districts. Although during the 1987-1992 drought San Francisco purchased approximately 107,848 AF of water, San Francisco only procured a small fraction of that amount from either of the Districts. [Footnote 177: The 107,848 AF of transfer water San Francisco secured during the 1987-1992 drought period pales in comparison to the 129,884 AF/year for 6 consecutive years--a total of 779,304 AF during the 6-year period--that San Francisco would need to obtain to replace the significant water supply reduction that it could experience if the State Water Board implemented a 40-percent flow objective on the Tuolumne River. See SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 16, Table 9.] The only water transfer completed during the 1987-1992 drought with either of the Districts was a 1990 water</p>	

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		<p>transfer from MID to San Francisco for 5,288 AF ("1990 Transfer Agreement"). [Footnote 178: Ritchie Decl. [ATT3] at ¶ 6; Agreement Relating to the Transfer of Water, December 20, 1990, attached hereto as Exhibit 20 [ATT28].] Although pursuant to the 1990 Transfer Agreement, MID was required to "utilize its best efforts to make available to [San Francisco] up to 20,000 acre-feet of pumped drainage water," (1990 Transfer Agreement, at ¶ 2), MID only made 5,288 AF available to San Francisco for purchase, and of that amount, only 4,891 AF was actually delivered). [Footnote 179: Ritchie Decl., supra note 3, at ¶ 6.] In accordance with its express terms, the 1990 Transfer Agreement terminated on March 15, 1991. [Footnote 180: Contrary to the State Water Board's apparent belief that there is an existing water transfer agreement in place between the Districts and San Francisco, no such agreement has been executed since the 1990 Transfer Agreement. See SED, at 16-15 (wherein the draft appears to reference "existing" transfer agreements between San Francisco and the Districts: "the [contemplated] water transfer [between the Districts and San Francisco] would be limited to the capacity of existing infrastructure and existing agreements.") (1990 Transfer Agreement, at ¶ 1).</p>	
1166	60	<p>[From ATT1:] The vast majority of the water purchased by San Francisco during the 1987-1992 drought came from sources that no longer exist, i.e., from the state-sponsored Drought Emergency Water Banks of 1991 and 1992 established by the California Department of Water Resources ("DWR"), or are no longer a source of reliable replacement supply, i.e., Placer County Water Agency ("PCWA"). [Footnote 181: The SED does not identify the possibility of San Francisco obtaining replacement water supplies either from a modern incarnation of the Emergency Drought Water Banks organized and implemented by DWR in 1991 and 1992, or from PCWA. See December 12th Workshop Transcript [ATT13] at 212:10-13 (where Mr. Grober acknowledges that State Water Board Staff did not consider transfers to San Francisco from any sources other than the Districts); id. at 213:6-12 (where Nicole Williams, Senior Environmental Planner at ICF Jones &amp; Stokes, clarifies that the SED's analysis of the in-Delta diversion project may have relied on "a cost associated with a water transfer that might have come outside of the irrigation districts.")]. During the 1987-1992 drought, San Francisco obtained a commitment from DWR's Drought Emergency Bank for 69,000 AF and from PCWA for 33,560. [Footnote 182: Of these amounts, only 52,000 AF was actually delivered by DWR, and only 21,042 AF was actually delivered by PCWA. (Ritchie Decl. [ATT3] at ¶ 6.)] However, given that DWR did not organize a drought water bank during the recent drought, and there is no basis to conclude that San Francisco would be able to effectuate a future dry-year water transfer with PCWA, it is not reasonable to assume that San Francisco could secure the requisite volume of replacement water from either of these sources. [Footnote 183: See e.g., Brekke, Dan, As California Drought Deepens, Those With Water Can Sell at a High Price, KQED (July 2, 2014), available at <a href="https://ww2.kqed.org/news/2014/07/02/california-drought-water-sales/">https://ww2.kqed.org/news/2014/07/02/california-drought-water-sales/</a>, attached as Exhibit 21 [ATT29] (explaining that "[d]uring the last drought, [DWR] ran a drought water bank, which helped broker deals between those who were short of water and those who had plenty. But several environmental groups sued, alleging the state failed to comply with [CEQA] in approving the sales, and won. This year, the state is standing aside, saying buyers and sellers have not asked for the state's help. 'We think that buyers and sellers can negotiate their own deals better than the state,' said Nancy Quan, a supervising engineer with the department.")]. Even if DWR organized and implemented a drought water bank in the future, it would need to address an array of challenges, including numerous legal issues that commenters have identified. [Footnote 184: See e.g., Brian E. Gray, The Market and the Community: Lessons from California's Drought Water Bank (2008) 14 Hastings W.-N.W. J. Envtl. L. &amp; Pol'y 41 (identifying challenges that must be addressed by any future state-</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the potential hydrologic effects of the plan amendments on the SFPUC RWS service area (including water bank account analysis modeling) and approaches to potential water supply reductions (including water transfers).</p>

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		<p>sponsored drought water banks, including legal considerations). (See id. at *57) (explaining that "because the transfers of water to the [1991 DWR] Bank overwhelmingly involved surface water held pursuant to riparian right and surface water for which groundwater was substituted, both the [State Water Board] and the laws that establish a process for protecting third-party water rights holders, fish and wildlife, instream flows, and other interests within the areas-of-origin were effectively removed from the transfer process. Moreover, because of the decision legally to characterize the transfers for which groundwater was substituted as transfer of surface water for one purpose and transfers of groundwater for another, the laws designed to protect the counties in which groundwater originates were circumvented.".) Assuming that a modern incarnation of the Drought Emergency Water Bank could surmount these challenges, there would inevitably be intense, competing demands on any attainable transfers. [Footnote 185: If the past is any indication of the level and source of competing demands for any transfers that may be available for a future Emergency Drought Water Bank, it is reasonable to assume there will be significant competition from Southern California. See Morris Israel &amp; Jay R. Lund, Recent California Water Transfers: Implications for Water Management (1995) 35 Nat. Resources J. 1, at *11 (explaining that "[a] total of 389,970 [AF] was purchased from the 1991 Water Bank by 12 entities, compared to 348 entities selling water. Three jurisdictions, Metropolitan Water District of Southern California (MWD), Kern County Water Agency and [San Francisco] accounted for over 80 percent of the purchases. MWD alone purchased 55 percent. Roughly 80 percent of 1991 Water Bank sales were for municipal and industrial uses.".)] Therefore, whether San Francisco would be able to secure the requisite amount of replacement supply, or any significant portion thereof, from the bank would be "speculative and unknowable." (SED, at 16-9.) Further, whether San Francisco would be able to secure a dry-year water transfer with PCWA during a future sequential-year drought for the requisite volume of replacement supply, or any significant portion thereof, is also "speculative and unknowable" in light of the agency's existing contractual commitments, potentially augmented regulatory obligations, and practical constraints. (Id.) PCWA has long-term agreements to sell water to several entities, including the City of Roseville, Sacramento Suburban Water District, and San Juan Water District, and in recent years has made short-term water transfers to additional entities, including the San Diego County Water Authority, Westlands Water District and the East Bay Municipal Utilities District ("EBMUD"). Moreover, EBMUD and PCWA are currently working on a long-term water transfer agreement whereby "EBMUD, as the buyer, would purchase between [10,000-47,000 AF/year] of transfer water from PCWA in dry years for diversion at the Freeport intake and delivery to EBMUD customers." [Footnote 186: East Bay Utility Management District Urban Water Management Plan 2015, available at <a href="http://www.ebmud.com/water-and-drought/about-your-water/water-supply/urban-water-management-plan/">http://www.ebmud.com/water-and-drought/about-your-water/water-supply/urban-water-management-plan/</a>, at 61 (describing current status of potential long-term water transfer between PCWA and EBMUD: "PCWA and EBMUD are seeking to complete all environmental reviews and approvals to implement the proposed project by 2017.".)] Given PCWA's existing (and potential future) contractual commitments regarding water transfers, it is unclear whether PCWA would be able and/or willing to sell a significant volume of replacement supply to San Francisco in the midst of a future, sequential-year drought. A number of potentially augmented regulatory requirements may also affect PCWA's ability and/or willingness to transfer surface water to other entities. For example, the Middle Fork American River Hydroelectric Project is currently the subject of a Federal Energy Regulatory Commission ("FERC") relicensing proceeding that may result in a new license that will require PCWA, as the licensee, to increase its instream flow releases. [Footnote 187: See e.g., Final Environmental Impact Statement for Hydropower License, Middle Fork American River Hydroelectric Project-FERC Project No. 2079-069, February</p>	

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		<p>2013, available at <a href="https://www.ferc.gov/industries/hydropower/enviro/eis/2013/02-22-13.asp">https://www.ferc.gov/industries/hydropower/enviro/eis/2013/02-22-13.asp</a>, at 117 (explaining that "[u]nder the proposed and Alternative 1 flow schedules, summer flows in wet and above normal water years would be higher than under existing conditions in all project-affected reaches. In summers of critical, dry, and below normal water years, minimum flows would be increased or maintained in all bypassed and peaking reaches compared with existing conditions.") It is unclear what effect, if any, new minimum instream flow release requirements imposed by FERC may have on PCWA's ability to provide water to its customers, and consequently, the agency's ability and/or willingness to transfer surface water to other entities. Moreover, the State Water Board plans to propose unimpaired flow objectives on the Sacramento River and its eastside tributaries as part of Phase 2 of the agency's process for amending the Bay-Delta Plan. [Footnote 188: See Working Draft Scientific Basis Report for New and Revised Flow Requirements on the Sacramento River and Tributaries, Eastside Tributaries to the Delta, Delta Outflow, and Interior Delta Operations, State Water Resources Control Board, October 2016, available at <a href="http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2016_1014_ph2_scireport.pdf">http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/2016_1014_ph2_scireport.pdf</a> at 1-12 (explaining that "[t]he numeric alternatives currently under development fall within and the range of 35 to 75 percent of unimpaired flow and will be further refined with modeling to evaluate needs to reserve cold water in storage and other considerations.")]. The State Water Board's ultimate amendment of the Bay-Delta Plan may require PCWA to comply with new regulatory obligations. Implementation of Water Code sections 10720, et seq. ("SGMA") will also presumably impose new restrictions on PCWA's extraction of groundwater considering the number of high-priority subbasins located in the agency's service territory. [Footnote 189: SGMA requires the formation of local groundwater sustainability agencies and the development and implementation of groundwater sustainability plans for each medium- or high-priority basin to provide for sustainable management. (See Wat. Code, §§ 10720.1(a) (identifying legislative goals of SGMA), 10723.6 (detailing methods for forming groundwater sustainability agencies), 10727(a) (prescribing that "[a] groundwater sustainability plan shall be developed and implemented for each medium- or high-priority basin by a groundwater sustainability agency to meet the sustainability goal established pursuant to this part.")]. Additionally, there are myriad practical limitations that could complicate a water transfer from PCWA to the SFPUC. For example, in December 2015, despite having surplus water available for sale, PCWA was unable to effect water transfers with entities south of the Delta due to limited pumping capacity. [Footnote 190: Placer County Water Agency, Board of Directors, Regular Meeting, Minutes, July 21, 2016, Book 26, at 117, available at <a href="https://res.cloudinary.com/pcwa/image/upload/pcwa-website/board-minutes/07-21-2016_Minutes.pdf">https://res.cloudinary.com/pcwa/image/upload/pcwa-website/board-minutes/07-21-2016_Minutes.pdf</a>, attached hereto as Exhibit 22 [ATT30] (explaining that "[i]n December, parties south of the Delta approached the Agency for water to refill their reservoirs. As hydrology improved, the ability to move water in the transfer season from north to south became limited because of limited pump capacity in the south Delta and interested buyers left the market.")]. PCWA, like many other water agencies, also has to contend with protests to proposed water transfers. [Footnote 191: Placer County Water Agency, Board of Directors, Regular Meeting, Minutes, June 18, 2009, Book 21, at 126, available at <a href="https://res.cloudinary.com/pcwa/image/upload/pcwa-website/board-minutes/06-18-2009_Minutes.pdf">https://res.cloudinary.com/pcwa/image/upload/pcwa-website/board-minutes/06-18-2009_Minutes.pdf</a>, attached hereto as Exhibit 23 [ATT31] (noting protests to the transfer between PCWA and San Diego County Water Authority.)].</p>	
1166	61	<p>[From ATT1:] The fact that San Francisco and the Districts executed the 1995 Side Agreement does not support the State Water Board's assumption that San Francisco will be able to effectuate the proposed large-scale water transfer with the Districts in the future. To</p>	<p>Please see response to comment 1166-60.</p>



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		<p>the extent that the State Water Board is relying on the 1995 Side Agreement in support of the assumption that San Francisco will be able to purchase the requisite volume of replacement water supply from the Districts, such reliance would be misplaced. [Footnote 192: In its PRA Request, San Francisco specifically asked for: "All public records containing information that served as the basis for Staff's conclusion that the volume of water identified in the 2016 Draft SED, Appendix L, at page L-21, Table L.4.-2, would be available for purchase by San Francisco from the [Districts] during a six-year drought if LSJR Alternatives 2, 3, or 4 were implemented." Knapp Decl. [ATT6] see Attachment 1 to Knapp Decl., Letter to Tom Howard, Executive Director, State Water Resources Control Board, from Jonathan Knapp, Deputy City Attorney, San Francisco City Attorney's Office, October 14, 2016 [ATT6:ATT1] at 1. In response to this request, the State Water Board identified the 1995 Side Agreement, among other documents. Knapp Decl. at ¶ 4.]More specifically, the history and existence of the 1995 Side Agreement does not constitute substantial evidence in the administrative record that the State Water Board can rely on for the conclusion that a large-scale water transfer with the Districts is a reasonably foreseeable method of compliance by San Francisco with implementation of a new unimpaired flow objective on the Tuolumne River. [Footnote 193: See Letter from California Sportfishing Protection Alliance, Tuolumne River Trust, American Rivers, American Whitewater, California Trout, Central Sierra Environmental Resource Center, Friends of the River, Golden West Women Flyfishers, Merced Fly Fishing Club, Trout Unlimited (collectively referred to as "Conservation Groups") to the State Water Resources Control Board, October 8, 2014 ("Conservation Groups' Letter"), at 11 (asserting that "[s]ince there is substantial evidence in the FERC record, and now in the record for Phase 1, that this contractual agreement was the solution in the only previous case in which additional flow was required (in this case, by FERC), it is reasonably foreseeable that the City and the Districts might once again conclude a similar agreement.".)]First, based on the modeling assumption used in the SED that the 1995 Side Agreement would continue to obligate the Districts to contribute the total amount of flow required by the 1996 Settlement Agreement, the proposed large-scale water transfer would not replace the 1995 Side Agreement, but instead, would represent an additional commitment of water by the Districts on top of the current FERC instream release flow schedule for the Don Pedro Project ("FERC Flow Schedule"). In order to analyze the reduction in San Francisco's water supply that could result if a new flow objective on the Tuolumne River that calls for a percentage of unimpaired flow to remain in the river between February and June is implemented, both San Francisco and the State Water Board assume San Francisco could be required to bypass 51.7 percent of the additional increment of flow above the current FERC Flow Schedule, while the Districts would continue to meet the existing FERC Flow Schedule under the terms of the 1995 Side Agreement. In compliance with the existing FERC Flow Schedule, the Districts currently release between 94,000 and 300,923 AF/year depending on the water year type (51.7 percent of that amount equates to approximately 48,598 to 155,577 AF/year). [Footnote 194: 1996 FERC Decision, 76 FERC ¶ 61117, 61608 (explaining that under the 1996 Settlement Agreement "[a]nnual minimum water releases from the project will range from 94 thousand acre feet (TAF) in the driest 6.4 percent of years to 301 TAF in the wettest fifty percent of years.".)]Based on the hydrological record from 1987 through 1992, the Districts would be required, between February and June, to bypass a total of 707,841 AF during the 6-year period under the existing FERC Flow Schedule. [Footnote 195: Ritchie Decl. [ATT3] at ¶ 7.] Assuming continuation of the 1995 Side Agreement, approximately 365,954 AF of this amount would be bypassed by the Districts on San Francisco's behalf. [Footnote 196: Id.] The State Water Board further assumes that during a 6-year drought sequence, using 1987-1992 hydrology, that beyond the 707,841 AF required to comply with the existing FERC Flow Schedule, the</p>	

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		<p>Districts would also be able to bypass--on San Francisco's behalf--an additional 714,000 AF (119,000 AF x 6 years = 714,000 AF) under a 40 percent unimpaired flow objective. (SED, at L-21, Table L.4-2). San Francisco's actual water supply deficit in this scenario is more severe, i.e., 129,884 AF x 6 years = 779,304 AF total. [Footnote 197 See SFPUC Analysis of Changes to Flow Criteria, [ATT4:ATT1] at 16, Table 9.] This would be on top of the water that the Districts themselves would be required to bypass under a new unimpaired flow objective, assuming they were responsible for 48.3 percent of the requisite flows. For example, under a 40 percent unimpaired flow objective, and assuming 1987-1992 hydrology, the Districts would be required to bypass, between February and June, 107,504 AF/year for 6 years, or 645,024 AF, in addition to the FERC flow schedule. [Footnote 198: Ritchie Decl. [ATT3] at ¶ 7.] Thus, based on the historical 1987-1992 hydrology, and assuming implementation of a 40 percent unimpaired flow objective, between February and June, during the 6-year drought sequence the Districts would be required to bypass approximately 707,841 AF under the existing FERC Flow Schedule and an additional 1,424,328 AF (645,024 AF + 779,304 AF) for a total volume of 2,132,169 AF. [Footnote 199: Id.] Significantly, this exceeds the total storage capacity of Don Pedro Reservoir, which is 2,030,000 AF. In short, the Districts' ability and willingness to bypass flow on behalf of San Francisco to meet the requirements of the existing FERC Flow Schedule, as provided by the 1995 Side Agreement, cannot be relied on as substantial evidence or precedent regarding the Districts' ability or willingness to bypass the additional, and far larger volume of water that San Francisco may be required to contribute in order to comply with a new unimpaired flow objective on the Tuolumne River. Second, under LSJR Alternatives 3 and 4 far more water would have to be bypassed in dry years than is currently required under the existing FERC Flow Schedule. For example, on average, in a critically dry year, the existing FERC Flow Schedule calls for approximately 67,521 AF to be bypassed on the Tuolumne River during the February-June period. By contrast, under a 40 percent unimpaired flow objective approximately 292,495 AF would have to be bypassed during the same period, over 4 times the amount of water. In fact, in 2014 the Conservation Groups referenced above suggested that the State Water Board consider modifying the proposed unimpaired flow requirements to "void short-term calamities" that may result during sequential-year droughts and specifically recommended that "the Board should evaluate specific options for limiting or mitigating water supply impacts to urban water users in particular during multiple dry year scenarios." [Footnote 200: Conservation Groups' Letter, supra note 193, at 9.] Unfortunately, however, the State Water Board did not act on the Conservation Groups' recommendation, and thus, compliance with the proposed unimpaired flow objectives, particularly LSJR Alternatives 3 and 4, requires a substantially greater volume of water to be bypassed in dry years than the existing FERC Flow Schedule. Third, the 1995 Side Agreement cannot be relied on as a predictor of any potential, future agreements between San Francisco and the Districts for the simple reason that the 1995 Side Agreement was executed nearly two decades prior to the State Water Board's initial release of its proposal for unimpaired flow objectives in 2012, and thus, the agreement did not contemplate the draconian water supply reductions, particularly in dry years, that could result from implementation of such an amendment to the Bay-Delta Plan for both San Francisco and the Districts, as detailed above. Additionally, there is no guarantee that San Francisco and the Districts will reach agreement on a new iteration of the 1995 Side Agreement, which terminates by its express terms upon issuance of a new FERC license for the Don Pedro Project. [Footnote 201: 1995 Side Agreement, at Provision 1.] If San Francisco and the Districts are unable to reach agreement regarding the allocation of responsibility for bypassing the volume of water called for in the existing FERC Flow Schedule, San Francisco's water supply shortages would be more severe, and San Francisco's corresponding need to obtain replacement water supplies would be that much</p>	

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		more substantial.	
1166	62	<p>[From ATT1:] Unlike the water transfer between the Districts and San Francisco contemplated by the State Water Board, the 1990 transfer from MID to San Francisco was expressly contingent on the water at issue being surplus to MID's needs. The 1990 Transfer Agreement was contingent on the water being surplus to MID's needs. MID agreed to pump groundwater during the non-irrigation season from certain wells located on the western side of its irrigation service territory that had historically only been operated during the irrigation season--from approximately March through October--for irrigation drainage and other incidental purposes. (1990 Transfer Agreement, at 1). But the agreement expressly stated that MID could "reduce or discontinue any or all deliveries of water to the City" if MID needed "the facilities to be utilized for the pumping and transportation of water under this agreement . . . to meet other requirements of the District," or the groundwater pumping "will, or is likely to, adversely affect the aquifer from which the water is being pumped or groundwater supply of adjacent or nearby groundwater users." (Id. at ¶ 6(a)(1-2).) By contrast, the SED contemplates that the Districts will transfer an unprecedented amount of water to San Francisco notwithstanding a substantial loss of supply to meet their existing water demands, and other material considerations. The SED assumes that under a 40 percent unimpaired flow objective the Districts will transfer approximately 119,000 AF/year every year for 6 consecutive years during a protracted drought while also bypassing their share of water to satisfy the flow objective on the Tuolumne River, and other associated requirements, e.g., the Tuolumne River's share of the proposed year-round minimum requirement of 1,000 cubic feet per second ("cfs") at Vernalis. [Footnote 202: See SED, at K-29 (explaining that "the LSJR base flow objective for February through June shall be implemented by requiring a minimum base flow of 1,000 cfs, based on a minimum 7-day running average, at Vernalis at all times. . . . When the percentage of unimpaired flow requirement is insufficient to meet the minimum base flow requirement, the Stanislaus River shall provide 29 percent, the Tuolumne River 47 percent and the Merced River 24 percent of the additional total outflow needed to achieve and maintain the required base flow at Vernalis."). It is unclear whether the 1,000 cfs minimum baseflow requirement at Vernalis would require additional releases from storage. See SFPUC Analysis of Changes to Flow Criteria [ATT4:ATT1] at 7 (explaining that the "SFPUC could not realistically evaluate the need for additional releases from storage to meet the Vernalis requirement in dry years.") Similarly, it is unclear how the State Water Board's application of the carryover storage requirement described in Appendix K would impact the operations of affected water agencies. (SED, at K-28 ["[w]hen implementing the LSJR flow objectives, the State Water Board will include minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse temperature or other impacts on fish and wildlife or, if feasible, on other beneficial uses."].)] The Districts have previously informed the State Water Board that even without the implementation of a new flow objective on the Tuolumne River, the Districts may simply not have water available to sell to San Francisco in certain dry years. [Footnote 203: See Letter from Roger VanHoy, General Manager, Modesto Irrigation District and Casey Hashimoto, General Manager, Turlock Irrigation District, to Mark Gowdy, State Water Resources Control Board, dated August 6, 2014, attached hereto as Exhibit 24 [ATT32] at 2 [explaining that "as this most recent drought has highlighted, it is hydrological reality that in certain dry years water will not be available to sell to CCSF, willingly or as otherwise contemplated by the State Water Board."].)]</p>	<p>Please see response to comment 1166-60. The plan amendments do not direct indirect or additional action(s) be taken by the regulated community to respond to potential reductions in surface water that may occur in response to implementation of the plan amendments. Water transfers are included in Chapter 16, Evaluation of Other Indirect and Additional Actions, because available information indicates water transfers have previously been implemented or were under consideration. Although entities may elect not to pursue certain other indirect or additional actions under particular circumstances, it is reasonable to include them in a portfolio of possible actions because they were considered or implemented in the past and may be appropriate for further consideration depending on how circumstances change.</p>

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1166	63	<p>[From ATT1:] Given the recent history of failed water transfers involving MID, and competing local interests regarding groundwater management in the Central Valley, it is not reasonably foreseeable that MID and TID would agree to export water that may be needed during a protracted drought. The SED unreasonably assumes that the Districts would willingly transfer water to San Francisco instead of meeting the needs in their respective service territories. (See e.g., SED, at L-22) ["[t]he analysis assumes that agricultural resources would not receive their total water supply to meet needed demand under each of the LSJR alternatives."]; id. at L-23 ["[a] larger water transfer under the LSJR alternatives between SFPUC and the irrigation districts could result in indirect environmental impacts on several resources as a result of the potential reduced surface water supply in the Central Valley (i.e., surface water supply going to SFPUC would not go to Central Valley surface water users)."].) This assumption contravenes the Districts' stated positions concerning their obligations to their respective customers. As the Districts previously explained to the State Water Board, "[f]irst and foremost, there is a broad variety of customers to which the Districts' water is already pledged, and any potential sale would necessarily have to be subject to those needs. The Districts' duty to serve its existing customers' varying demands is the paramount use of District water, if not the very purpose of the Districts' locally-financed water distribution and storage system." [Footnote 204: Districts' Letter [ATT32] at 2. For a comparable articulation of local sentiment by another irrigation district in the Central Valley see Stockton East Water District Water Management Plan, January 20, 2014, available at <a href="http://www.water.ca.gov/wateruseefficiency/sb7/docs/2014/plans/Stockton-East_WD_WMPFinal_012014.pdf">http://www.water.ca.gov/wateruseefficiency/sb7/docs/2014/plans/Stockton-East_WD_WMPFinal_012014.pdf</a>, at 15 ("Transfer water policy is in the [Stockton East Water District or "SEWD"] Act under Section 6. The policy specifies that SEWD can sell water outside the district, as long as the SEWD water users' needs are met first, and water is available.".)] Moreover, the SED's assumption ignores the recent history of San Francisco's failed attempts to secure a relatively small water transfer from MID or the Oakdale Irrigation District ("OID") and the related local opposition in Stanislaus County concerning water transfers to San Francisco. The most recent effort to transfer a relatively small amount of water--2 million gallons per day ("mgd")--from MID to San Francisco met with significant local opposition and MID was unable to approve the agreement. [Footnote 205: See San Francisco Letter [ATT12] at 4, n. 9 (citing, Holland, John, "Modesto Irrigation District kills proposed water sale," Modesto Bee (September 18, 2012) available at <a href="http://www.modbee.com/2012/09/18/2378903/modesto-irrigation-district-kills.html">http://www.modbee.com/2012/09/18/2378903/modesto-irrigation-district-kills.html</a>, attached hereto as Exhibit 25 [ATT33] [explaining that MID voted to cease negotiations with CCSF regarding the proposed 2 mgd water transfer].) See also Closed Session Resolution No. 2012-07 Directing Staff and General Counsel to Discontinue Further Negotiations Regarding the Proposed Sale of Water to the City and County of San Francisco, Modesto Irrigation District, September 18, 2012. (San Francisco Letter [ATT12] at Attachment 1.) Remarkably, despite relying on a potential future large-scale transfer of water from the Districts to San Francisco in its analysis, the SED recognizes that MID's recent "rejection" of the proposed 2 mgd water transfer "makes further temporary drought transfers uncertain." (SED, at L-20.)] San Francisco also pursued a 2 mgd water transfer with OID that would have required an exchange between OID and MID, but, again, the parties were unable to reach agreement to effectuate the transfer, even though the water in question would have come from OID and not MID. [Footnote 206: San Francisco Letter [ATT12] at 4, n. 10 (citing Stapley, "Modesto Irrigation District blocks Oakdale water sale to SF, for now," The Modesto Bee (January 23, 2014) available at <a href="http://www.modbee.com/news/special-reports/groundwater-crisis/article3159608.html">http://www.modbee.com/news/special-reports/groundwater-crisis/article3159608.html</a>, attached hereto as Exhibit 26 [ATT34]; see also Stapley, "OID reveals big-money water sale to outside buyers," The Modesto Bee (October 13, 2015), available at <a href="http://www.modbee.com/news/article39016221.html">http://www.modbee.com/news/article39016221.html</a>,</p>	Please see response to comment 1166-60.

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		<p>attached hereto as Exhibit 27 [ATT35] ["With the drought worsening two years ago, OID formally sought offers from MID and its partners on the Tuolumne River, the Turlock Irrigation District and San Francisco. At the [Stanislaus Local Agency Formation Commission] meeting, [OID General Manager Steve Knell] said MID and TID 'didn't want any part of it;' at last week's OID meeting, he said, 'after meeting with MID, we decided there was no point in pursuing this.'").]Local opposition concerning a water transfer to San Francisco also surfaced in the comments of two Stanislaus County Board of Supervisors in 2013 regarding a then proposed local groundwater management ordinance. Prior to its adoption, the two Supervisors "praised the proposed ordinance because it would prevent an irrigation district from pumping groundwater to replace surface water sold to a buyer outside the county. That scenario was raised by the Modesto Irrigation District's proposal to sell water to San Francisco, which was dropped last year after months of fierce debate." [Footnote 207: Carlson, Ken, Stanislaus County Supervisors to Vote on Water Export Rules, Modesto Bee (September 9, 2013), attached hereto as Exhibit 28 ATT36.] The State Water Board's assumption that MID, TID, or any other irrigation district or water agency, would willingly sell water to San Francisco that is needed within its respective service territory in the midst of a protracted drought--and following implementation of the proposed LSJR Alternatives, which will exacerbate dry year water supply reductions--is pure speculation. Accordingly, the SED's untenable assumption does not constitute substantial evidence under CEQA. (Pub. Res. Code, § 21080(e)(1-2) ) [explaining that for purposes of CEQA "substantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact," but does not include "argument, speculation, unsubstantiated opinion or narrative, [or] evidence that is clearly inaccurate or erroneous . . .".)]</p>	
1166	64	<p>[From ATT1:] The analysis in the SED fails to consider the effect of the Sustainable Groundwater Management Act and local groundwater management ordinances in the Central Valley. By assuming that MID and TID will increase their current levels of groundwater pumping in order to facilitate a large-scale transfer of surface water to San Francisco, the SED not only contradicts its own conclusion that the current level of groundwater pumping in the Modesto and Turlock subbasins is unsustainable, but also ignore the potential limitation on groundwater pumping within the Districts that may result from implementation of SGMA and recently enacted groundwater management ordinances in the Central Valley. The SED references DWR's classification of the Modesto and Turlock subbasins as high-priority groundwater basins [Footnote 208: See e.g., SED, at 9-27 (noting that "[i]n 2014, DWR's [California Statewide Groundwater Elevation Monitoring or "CASGEM"] Program ranked the Modesto Subbasin as a high priority groundwater basin, partially due to the basin's history of groundwater reliance for agricultural and municipal use, and water quality degradation due to industrial and agricultural practices."); id. at 9-29 (noting same for Turlock Subbasin).] that must be covered by adopted groundwater sustainability plans ("GSP") by January 31, 2022, (SED, at 9-33), and that increases in pumping caused by adoption of the Plan Amendment may not be sustainable. The SED explains that "[a]dditional pumping in any of [the four subbasins in the plan area, i.e., the Modesto, Turlock, Merced and Eastern San Joaquin Subbasins] would likely reduce the average groundwater level, with a noticeable effect on groundwater levels over a number of years," and cautions that the estimated rates of groundwater overdraft in these subbasins "bring into question how long such levels of overdraft can be sustained." (SED, at ES-34.) The draft identifies a number of factors that "should be considered to make estimates and determinations of sustainability," including that "[t]here will be very large associated effects, including subsidence and loss of recharge capacity, that occur long before all water in an aquifer could be removed," and consequently recommend "[t]his means that action is</p>	<p>These comments concern the SED analyses related to the potentially significant impacts to the environment from the revised flow objective in the plan amendments. The revised flow objective will require, on average, an increase in the unimpaired flows (i.e. flows left instream) in order to reasonably protect fish and wildlife. In and of themselves, the flows do not create potentially significant adverse impacts to groundwater resources and agricultural resources (e.g. potential conversion to non-agricultural use). In essence, with respect to groundwater resources and agricultural resources, the SED analyzes, on a programmatic level, what potentially significant impacts could occur from reduced surface water supplies and the potential local response to reduced surface water supplies. Because the actual local response is unknowable, the SED analyzes potential environmental impacts in a more conservative manner (i.e. more worst-case). For example, the SED must assume that local irrigators might pump groundwater in substitution for reduced surface water supplies. If they did so, there could be potentially significant impacts on the groundwater basin, but local irrigators would maintain agriculture in production. On the other hand, with less surface water supplies, the SED also assumes the inverse: local irrigators might take land out of agricultural production instead of pumping groundwater. This would reduce potential impacts to groundwater resources, because there would be less pressure to pump groundwater supplies, but this decision could increase potentially significant impacts to Important Farmland (as defined in the SED) from increased conversion to non-agricultural use. As described in Chapter 11, Agricultural Resources, farmers could also make adaptations that would keep land in agricultural production with less water, such as water conservation measures, shifting to crops requiring less water, temporary fallowing, and other measures. If implemented, these measures could reduce the significance of impacts to both groundwater and agricultural resources. However, the choices that local farmers and ranchers will make are unknowable; therefore, the SED analyses take a conservative approach and assume that the potential impacts to both groundwater and agricultural resources are significant and unavoidable. The commenter also appears to be suggesting that by analyzing the potential for increased groundwater pumping, the SED and plan amendments are requiring or encouraging such action. That is incorrect. 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</p>

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		<p>needed now to address groundwater overdraft in the four groundwater subbasins, with or without the plan amendments." (Id. at ES-34-ES-35.) However, having admonished MID and TID, amongst others in the four subbasins to take action "now" to address groundwater overdraft, prior to the adoption of GSPs in January 2022, the SED nonetheless assumes the Districts will be able to make up the volume of surface water transferred to San Francisco through increased groundwater pumping (not to mention the increased groundwater production within the Districts that would be necessary to offset the Districts' reduced surface water deliveries following implementation of a new unimpaired flow objective). (SED, at 16-14 ["[s]urface water transfers implemented through groundwater substitution could result in a lowering of groundwater levels if groundwater is pumped in substitution for transferred water and could contribute to impacts on groundwater levels or groundwater quality, as described in Chapter 9, Groundwater Resources. Chapter 9 assumes that reductions in surface water supply would be replaced with groundwater pumping up to a maximum amount. Based on this analysis, significant impacts would occur on four primary subbasins (Eastern San Joaquin, Turlock, Modesto, and the Extended Merced)."]; id. at 16-10 ["Groundwater wells could potentially be constructed as part of groundwater substitution transfers, and if this were to occur, potential environmental effects associated with construction and operation would be similar to those impacts discussed for substitution of surface water with groundwater."]; id. at 16-16 ["Reductions in surface water diversions are expected as a result of approving the LSJR alternatives and the respective program of implementation. A reasonably foreseeable method to augment a surface water supply is to obtain more water from groundwater resources. This could be achieved by additional pumping from existing wells or the development of new groundwater wells."].) In fact, the State Water Board acknowledges that its analysis of groundwater impacts does not consider the potential effect of SGMA, which it characterizes as "an ameliorating factor," thus suggesting that the groundwater impacts depicted in the SED would be less severe because SGMA would constrain future groundwater pumping to some extent. (SED, at 9-3) ["However, since the groundwater protections that will be afforded by SGMA cannot be determined at this time with precision, this chapter evaluates the potential impacts on groundwater levels from LSJR alternatives without including SGMA as an ameliorating factor, which means that estimates of impacts are likely more conservative (i.e., worse) than would occur in the groundwater basins over time."].) Significantly, the analysis fails to consider the extent to which SGMA may be a limiting factor that could, in the near term, constrain the Districts' ability to replace lost surface water--be it as a result of reduced diversions from the Tuolumne River and/or a large-scale water transfer to San Francisco--by increased reliance on groundwater pumping. Similarly, although the SED states that a recently enacted groundwater management ordinance in Stanislaus County [Footnote 209: Both MID and TID are located in Stanislaus County] "restricts out-of-county transfers of groundwater or pumping to replace surface water sold to buyers outside of the county," [Footnote 210: See Stanislaus County Municipal Code Section 9.37.040 (prohibiting "[t]he export of water," subject to certain express exemptions); id. § 9.37.030(7) [defining "Export of water" to mean "the act of conveying groundwater, or surface water for which groundwater has been substituted, out of the county."].)] (SED, at 9-42), and emphasizes that given SGMA's statutory mandate to local agencies to protect and manage high and medium priority groundwater basins "mitigation to protect the groundwater basin[s] from the indirect impacts of the LSJR alternatives . . . under local authorities is both feasible and required," (id. at 9-61), the analysis nevertheless assumes that the Districts may make up the volume of water sold to San Francisco by increased groundwater pumping without analyzing the potential application of the ordinance to such a transfer. The SED makes no attempt to reconcile the existence of Stanislaus County's groundwater management</p>	<p>was required to analyze this reasonably foreseeable and its impact on the groundwater basins from this local response. As discussed in more detail below, Sustainable Groundwater Management Act (SGMA) implementation has not yet begun and will be implemented over 20 years. Therefore, how local agencies may implement SGMA is speculative. Please see Chapter 16, Evaluation of Other Indirect and Additional Actions, Section 16.2, Lower San Joaquin River Alternatives—Other Indirect Actions, for a description of the actions that affected entities may take to develop alternative water supply sources needed to replace surface water that may no longer be available due to implementation of an LSJR alternative and its associated environmental effects. Substitution of surface water with groundwater is one of the actions described in the Chapter, but not the only action. The plan amendments do not violate SGMA for multiple reasons. First, as emphasized above, the plan amendments do not require groundwater pumping. Second, compliance with SGMA is based on an evaluation by the state as to whether local public agencies have met certain requirements. If they have not, the State Water Board takes specified actions to regulate the groundwater basin. SGMA was passed by the legislature in 2014 to address overdraft issues and associated negative impacts to groundwater basins from local over-extraction. SGMA requires local public agencies in the plan area form groundwater sustainability agencies (GSAs) by June 30, 2017 and draft groundwater sustainability plans (GSPs) by 2020 for critically overdrafted basins and 2022 for all other basins. GSAs have 20 years to implement GSPs and achieve sustainability. GSAs are now formed in the plan area, but GSPs have yet to be drafted or implemented. The SED could not consider such GSPs because they do not yet exist, and GSPs may take different and as-yet-undetermined approaches to managing a groundwater basin including plans and programs to implement water efficiencies, capture stormwater for recharge, etc. SGMA is not a moratorium on groundwater pumping and it is unknown what approaches GSAs in the plan area would take to implement pumping reductions or how groundwater pumpers may work to allocate pumping among themselves. In addition, the SED appropriately acknowledges that future SGMA implementation could affect the local response in two ways: If the local GSA were to curtail pumping, that would reduce potential impacts to the groundwater basin from increased overdraft, but could increase potential conversion of important farmland to nonagricultural use. Thus, Chapter 9, Groundwater Resources, properly identifies future SGMA implementation as a potential mitigation for groundwater impacts, but states that it is infeasible at this time for the State Water Board to impose the mitigation, because under SGMA timelines such administration is currently within local control. In addition, Chapter 17, Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources, acknowledged future SGMA implementation among its cumulative impacts to agricultural resources. The State Water Board acknowledges that reaching sustainability in these overdrafted basins will be challenging, but the plan amendments do not conflict with SGMA. Instead, knowledge of the plan amendments during the GSP drafting phase allows for integrated planning of scarce water resources that does not trade impacts between surface water and groundwater. For additional discussion of SGMA, please see Master Response 3.4, Groundwater and the Sustainable Groundwater Management Act. The commenter also appears to be making the assertion that water transfers to San Francisco will be infeasible because irrigators will not be able to pump the groundwater basin in substitution due to SGMA or because of the Stanislaus County groundwater ordinance, as described. However, water transfers are not predicated on exporting groundwater out-of-basin or pumping groundwater in substitution. The SED was required to analyze the potential impacts of groundwater substitution, but that does not mean that groundwater substitution is inevitable. For example, a landowner might temporarily fallow land during a dry period and rely upon water transfer revenue for supplemental income. The commenter cites to Uphold Our Heritage v. Town of Woodside (2007) 147 Cal.App.4th 587 in support of a general assertion that there was a lack of substantial evidence. However, citing to Uphold Our Heritage is misplaced. That case concerned the lack of evidence in a project-specific analysis by the Town of Woodside of whether or not a CEQA alternative was infeasible because it was "economically unjustifiable". Here, the assumption of potential transfers and related impacts and benefits in the programmatic SED analyses is economically justified and supported by substantial evidence of past transfers from MID and TID to San Francisco. (See Appendix L, City and County of San Francisco Analyses.) Also, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a</p>

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		<p>ordinance with the assumption that the reductions in the Districts' water supply--as a result of the implementation of a new flow objective on the Tuolumne River and the contemplated large-scale water transfer to San Francisco--"would be replaced with groundwater pumping up to a maximum amount." (Id. at 16-14). The analysis disregards the significance of materials facts, i.e., the existence of SGMA, the groundwater management ordinance in Stanislaus County, and similar groundwater management ordinances that have been enacted in counties throughout the Central Valley. [Footnote 211: The Draft 2016 repeatedly refers to a future water transfer between the Districts and San Francisco as a source of replacement water supply for San Francisco. (See e.g., SED, at 20-27 ["[t]he analysis presented in this section (and described in greater detail in Appendix L, City and County of San Francisco Analyses) assumes that under LSJR Alternatives 2, 3, and 4, during drought periods, SFPUC could meet its potential water supply shortage by buying water from MID and TID."].) However, the SED also more obliquely refers, in at least two instances, to San Francisco purchasing water from "willing sellers in the Central Valley." (See e.g., id. at 20-34 ["In addition, the potential economic effects of purchasing water (i.e., water transfers) by SFPUC from willing sellers in the Central Valley are analyzed."]; id. at L-1 (same).)] [Footnote 211, continued: To the extent the draft is suggesting that it is reasonably foreseeable that San Francisco will be able to secure a large-scale water transfer from a different, unidentified entity in the Central Valley, San Francisco observes, as the SED recognizes, similar groundwater management ordinances have been enacted in several counties in the Central Valley, in addition to Stanislaus County. (See SED, at 9-42 [noting that "[s]everal ordinances applicable to groundwater resources that underlie the Stanislaus, Tuolumne, and Merced Rivers and [San Joaquin River] have been passed."]; see e.g., San Joaquin County Municipal Code § 5-8100(c) [providing that "[i]t is essential for the protection of the health, welfare, and safety of the residents of the County, and the public benefit of the State, that groundwater resource of San Joaquin County be protected from harm resulting from the extraction of groundwater for use on lands outside the County, until such time as needed additional surface water supplies are obtained for use on lands of the County, or overdrafting is alleviated, to the satisfaction of the Board."].) Accordingly, the analysis in the SED is internally inconsistent and fails to provide an adequate factual basis for the State Water Board to conclude that it is reasonably foreseeable that San Francisco can replace its lost water supply through a transfer with the Districts. (Uphold Our Heritage v. Town of Woodside (2007) 147 Cal.App.4th 587, 596 (citing Bakersfield Citizens for Local Control v. City of Bakersfield (2004) 124 Cal.App.4th 1184, 1198 (internal quotation omitted) [explaining that "[t]he substantial evidence standard is applied to conclusions, findings and determinations. . . . Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts."].)</p>	<p>discussion on existing water sources and potential responses that CCSF can compensate for reduction in surface water supply, which is not limited to water transfers, and groundwater use. Please see Master Response 3.6, Service Providers, for information regarding drinking water quality and a discussion on the reason why the LSJR flow objectives would not jeopardize municipal water supply.</p>
1166	65	<p>[From ATT1:] The SED's environmental analysis of a large-scale water transfer from the Districts to San Francisco improperly relies on the WSIP PEIR's environmental analysis of a proposed 2 mgd transfer with the Districts. The SED references the WSIP PEIR's environmental analysis of a proposed 2 mgd transfer from the Districts to San Francisco and states that "this information is useful because it provides context for the potential to transfer water and the types of impacts associated with the transfer of water." (SED, at L-23.) The SED's reliance on the environmental analysis in the WSIP PEIR is misplaced for two reasons. First, the requisite amount of replacement supply that San Francisco would need if it were obligated, under the Fourth Agreement, to contribute flow to satisfy a 40 percent unimpaired flow objective on the Tuolumne River, assuming 1987-1992 hydrology, i.e., 129,884 AF/year for 6 consecutive years, is exponentially more water than the proposed 2 mgd transfer (equivalent to 2,240 AF/year) that was analyzed in the WSIP PEIR. Second, the potential 2 mgd transfer analyzed</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a discussion of water transfers as they relate to the analysis contained in the SED.</p>

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		<p>in the WSIP PEIR solely involved the use of conserved water--not a transfer of surface water to be replaced by groundwater substitution. (See WSIP PEIR, at 9-78 [explaining that the proposed 2 mgd transfer between the Districts and San Francisco involved a "transfer of conserved water only, rather than a transfer of stored water."]; id. at 9-81 ["the [proposed] water transfer agreement with TID, MID or other agency(ies) specify conserved water."]; see also SED, Appendix H, at H-5 [excerpting section of Final WSIP PEIR that identifies potential mitigation measures that a seller could implement to supplement its water supply following a water transfer "that involves use only of conserved water."].) [Footnote 212: DWR and the State Water Board have acknowledged the limited availability of water transfers using conserved water. See Background and Recent History of Water Transfers in California Prepared for the Delta Stewardship Council by the Department of Water Resources and the State Water Resources Control Board, July, 2015, available at <a href="http://www.water.ca.gov/watertransfers/docs/Background_and_Recent_History_of_Water_Transfers.pdf">http://www.water.ca.gov/watertransfers/docs/Background_and_Recent_History_of_Water_Transfers.pdf</a> (referred to below as "SWRCB/DWR Water Transfer History"), at 5 (emphasizing that "[t]ransfers based on implementation of water conservation measures have been limited, because most conservation programs" cannot demonstrate, among other things, that the "conservation measures . . . result in a reduction in the consumptive use of water or prevent water from discharging to an unusable water supply [and thereby] make water available for transfer."]. San Francisco incorporates the SWRCB/DWR Water Transfer History herein by reference.)By contrast, the environmental analysis of surface water transfers implemented through increased groundwater pumping--particularly in groundwater basins designated as "high priority" by DWR--would presumably involve disparate impacts. For example, the SED explains that environmental impacts from the proposed 2 mgd water transfer described in the WSIP PEIR, "would be less than significant" for a number of "resources on the Tuolumne River," including "groundwater." (SED, at L-23). This conclusion, of course, has no relevance to the transfer of surface water to be implemented through groundwater substitution, as contemplated in the SED, because, by the State Water Board's own account, "[s]urface water transfers implemented through groundwater substitution could result in a lowering of groundwater levels if groundwater is pumped in substitution for transferred water and could contribute to impacts on groundwater levels or groundwater quality." (Id. at 16-14.) The SED's reliance on the environmental analysis of the proposed 2 mgd transfer of conserved water from the Districts to San Francisco that appears in the WSIP PEIR to disclose the environmental impacts of a much larger transfer that could involve groundwater substitution is inaccurate and erroneous. The environmental assessment of impacts associated with the transfer of surface water implemented through conservation fails to identify the disparate impacts associated with the transfer of surface water implemented through groundwater substitution, and thus, does not constitute substantial evidence in the record. (Pub. Res. Code, § 21080(e)(2) [explaining that for purposes of CEQA "substantial evidence" does not include "evidence that is clearly inaccurate or erroneous."].) Further, by relying on the WSIP PEIR analysis of a transfer of 2 mgd of water to identify the environmental effects of a transfer of 129,884 AF/year for 6 consecutive years (to satisfy San Francisco's potential responsibility for a 40 percent unimpaired flow objective, assuming 1987- 1992 hydrology) the analysis fails to identify impacts associated with a transfer of this magnitude. The SED completely fails to disclose the significant environmental impacts that would arise from the massive water transfer, potentially through groundwater substitution, that would be needed to comply with the proposed flow objective.</p>	
1166	66	<p>[From ATT1:] The SED's economic analysis of a large-scale water transfer improperly relies on an assumed purchase price for the water without any reasonable basis for determining</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding ranges of prices for water transfers based on confirmed and executed temporary</p>



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		<p>such a purchase price. Pursuant to the certified regulatory program for the State Water Board's water quality control planning program and Water Code Section 13241(d), the State Water Board is required to analyze the economic impacts of reasonably foreseeable methods of compliance with the proposed unimpaired flow objective on the Tuolumne River. (Cal. Code Regs., tit. 23, § 3777(c); Cal. Code Regs., tit. 14, § 15187(d); Pub. Res. Code § 21159(c); Wat. Code, § 13241(d); Attwater Memo [ATT11] at 4). However, the SED fails to adequately analyze the economic impacts that would result from reduced water deliveries throughout the RWS service territory. Although the SED repeatedly emphasizes that the concept of a large-scale water transfer from the Districts to San Francisco for 6 consecutive drought years "relies on numerous unknown variables," including "the price of the water," (SED, at L-22, 20-27), the analysis assumes that San Francisco would be able to purchase water from the Districts for \$1,000/AF, (id. at 20-48). The SED explains, "[t]his assumed price is key to the analysis, and is derived based on a review of recent water purchases involving both MID and TID, as well as by other agricultural districts in California." (Id. at 20-48.) The SED does not disclose any details of these purported recent water purchases involving both MID and TID. In its document request under the California Public Records Act, Government Code Sections 6250, et seq. ("PRA"), San Francisco specifically asked the State Water Board to provide: "All public records containing information that served as the basis for Staff's analysis in the 2016 Draft SED that identify 'recent water purchases involving both [Modesto Irrigation District ('MID')] and [Turlock Irrigation District ('TID')], as well as by other agricultural districts in California,' as stated in the 2016 Draft SED at page 20-48, including, but not limited to, the price of the water and volume(s) transferred." [Footnote 213: CCSF PRA Request [ATT6:ATT1] at 1.] In response, the State Water Board failed to identify any recent water transfer agreements that involved both MID and TID. [Footnote 214: Knapp Decl. [ATT6] at ¶¶ 5-6 (explaining that the State Water Board identified the Agricultural Water Management Plan 2015 Update for the Modesto Irrigation District, referred to below as "2015 MID Water Management Plan," in its response to CCSF's PRA Request). The 2015 MID Water Management Plan details MID's limited experience with out-of-district transfers. See 2015 MID Water Management Plan, available at <a href="http://www.water.ca.gov/wateruseefficiency/sb7/docs/2015/plans/Modesto%20ID%202015%20AWMP.pdf">http://www.water.ca.gov/wateruseefficiency/sb7/docs/2015/plans/Modesto ID 2015 AWMP.pdf</a>, at 39 (recounting that "[d]uring the 1987 through 1992 drought, MID transferred several thousand acre-feet of water to [San Francisco]," and "participated in the transfer of water [between 1999 and 2010] through a U.S. Bureau of Reclamation program for river and fishery enhancement known as the Vernalis Adaptive Management Program (VAMP)," but has not "transferred any water outside its irrigation service area from 2010 to 2014.".)] In fact, the only agreement identified in the reference sections for the SED or provided in response to San Francisco's PRA request that involves both MID and TID is the agreement executed between the Districts and San Francisco over 2 decades ago, in 1995, as described above, in which San Francisco agreed to make annual payments to the Districts in exchange for the Districts meeting all the minimum instream flow release requirements prescribed by the 1996 Settlement Agreement (1995 Side Agreement). [Footnote 215: The SED includes the 1995 Side Agreement in the list of references for Appendix L, not Chapter 20, in which the \$1,000/AF assumed purchase price is identified. See SED, at L-41-L-42 (citing City and County of San Francisco (CCSF), Turlock Irrigation District (TID), and Modesto Irrigation District (MID). 1995. Agreement. April 21).] Reliance on the 1995 Side Agreement in support of the assumed purchase price of \$1,000/AF is faulty for at least two reasons. First, as noted, the 1995 Side Agreement was executed over 2 decades ago, and thus, does not constitute substantial evidence of the purchase price of water on the current transfer market. Second, the 1995 Side Agreement does not take into account the water supply impacts on the Districts that would result from the State Water Board's implementation of</p>	<p>water transfers in 2015, and costs for developing alternative sources of water supplies. The assumed price of \$1,000/AF is not inconsistent with the range presented in Master Response 8.5.</p>

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		<p>LSJR Alternatives 3 and 4, particularly during sequential-year droughts, and how such impacts would increase the price of any water that may be available for purchase. Given the heightened demand for water on the transfer market that would occur as a consequence of the State Water Board's proposal, especially during protracted droughts, the purchase price of water will certainly continue to rise, perhaps precipitously, assuming it is even available for transfer. For example, between 2009 and 2014 the price of water grew "tenfold to as much as \$2,200 an acre-foot." [Footnote 216: See e.g., Brekke [ATT29].] While acknowledging that the assumed purchase price of water transfers is key, the SED fails to provide evidentiary support for reasonable assumptions about the probable price of water transfers under its proposal.</p>	
1166	67	<p>[From ATT1:] The assumption that potential water transfers would simply make up for reduced water supply is not reasonable or logical because it fails to take into account that transfers are needed to ensure delivery reliability in dry years and to meet projected future demand. It is not reasonable to assume that additional, potential water transfers represent a new and unaccounted for source of replacement supply that the SFPUC could use to mitigate water supply reductions that may result from implementation of the LSJR Alternatives during protracted droughts. The SFPUC's water supply plans already rely on a potential water transfer of 2 mgd from the Districts to ensure delivery reliability to meet existing demand in dry years, and on a potential transfer of 25 mgd to meet projected future demand through 2040. Specifically, the Phased WSIP Variant adopted by the SFPUC relies on a potential 2 mgd water transfer with the Districts in order to ensure delivery reliability in dry years. [Footnote 217: WSIP CEQA Findings [ATT10] at 3 (explaining that "[u]nder the Phased WSIP Variant, the SFPUC also would implement the delivery and drought reliability elements of the WSIP, including the . . . proposed dry-year transfers from the [Districts].")] Further, the SFPUC has projected the need for an additional water transfer of up to 25 mgd in order to meet projected future demand by 2040. [Footnote 218: WaterMAP, Draft May 2016 2040 WaterMAP: A Water Management Action Plan for the SFPUC, available at <a href="http://sfwater.org/Modules/ShowDocument.aspx?documentid=9750">http://sfwater.org/Modules/ShowDocument.aspx?documentid=9750</a>, at 2 ("[b]ased on regional activity over the past two years, for planning purposes, it is estimated that up to 25 mgd in transfers could be available to the SFPUC. This estimate is consistent with the planning estimate evaluated in the PEIR for the WSIP.")] This future demand specifically takes into account the additional 19.5 mgd of demand associated with: (1) the SFPUC offering permanent status to Santa Clara and San Jose via combined individual supply guarantees; (2) the SFPUC offering an increase of 1.5 mgd to East Palo Alto's current individual supply guarantee; and (3) recovering net losses in yield of 3.5 mgd resulting from local watershed instream flow requirements in drought and non-drought years. [Footnote 219: [Id. at 1.]The WaterMAP assumes that a 2 mgd dry-year transfer will be in place by 2018. [Footnote 220: Id. at 11 ("For the purpose of this water supply planning document, it is assumed that a 2 mgd drought year transfer will be secured as part of the implementation of the Phased WSIP.")] By contrast, the SED explicitly states that water transfers, as contemplated in the draft, would solely be used to replace reductions in surface water supply that result from implementation of the LSJR Alternatives in order to meet existing demand. (SED, at 16-16 ["[a] water transfer is not expected to result in an increase in population or growth or the development of housing, or the need for housing, because the water would be used to meet existing demand in a particular service area for a particular duration of time."]) Thus, the SED not only ignores the water supply planning obligations of the affected water agencies, including the SFPUC, but also disregards the agencies'</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a discussion of the feasibility of water transfers to help meet water supply demands if surface water supplies are reduced. Also, as indicated in Chapter 13, Service Providers, Chapter 16, Evaluation of Other Indirect and Additional Actions, and Appendix L, City and County of San Francisco Analyses, service providers (e.g., SFPUC) may choose any approach described in Chapter 16, or a combination of approaches, or they may identify another as-yet unknown approach to meet their own unique needs. The analysis in the SED did not assume that any single action described in Chapter 16 would replace the entire reduction in surface water to SFPUC due to implementation of the LSJR alternatives. Programmatic planning decisions such as amending the Bay-Delta Plan, may be evaluated at a broad level under the California Environmental Quality Act, deferring the development of detailed site-specific information to future project-specific review. The 2016 Recirculated Draft SED is a programmatic document, as is discussed in Master Response 1.1, General Comments, which provides a general description of programmatic documents, and Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, which discusses the programmatic analysis as it relates specifically to CCSF and the SFPUC RWS service area. To ensure that the State Water Board considered sufficient information to appropriately analyze impacts at a programmatic level, urban water management plans (UWMPs) were reviewed and incorporated in the Regulatory Background section of Chapter 13, Service Providers, and were considered, as appropriate, in the impact analyses and the economic considerations in Chapter 20, Economic Analyses, and in Appendix L, City and County of San Francisco Analyses. Specifically, the UWMP for CCSF was reviewed, and the pertinent information related to water supply is summarized and used for the analyses in Chapters 13 and 20, and Appendix L.</p>

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		<p>respective Urban Water Management Plans, and other planning documents. [Footnote 221: See SFPUC 2015 UWMP, 2015 Urban Water Management Plan for the City and County of San Francisco, San Francisco Public Utilities Commission, June 2016 (referred to below as "SFPUC 2015 UWMP"), available at <a href="http://www.sfwater.org/modules/showdocument.aspx?documentid=9301">http://www.sfwater.org/modules/showdocument.aspx?documentid=9301</a>, at 6-5 (describing elements of Phased WSIP Variant adopted by the SFPUC); id. at 7-4-7-7 (describing dry year water supply projects identified in the Phased WSIP Variant); id. at 7-6 (explaining that "[t]he Phased WSIP . . . only included a 2 mgd dry year transfer [with the Districts] as that was the dry year need associated with meeting a demand of 265 mgd.".)] In the case of the SFPUC, the SED does not even attempt to reconcile the assumption that San Francisco will be able to purchase the requisite volume of replacement supply, with the fact that the SFPUC has already taken the potential availability of water transfers into consideration as part of its water supply planning to meet existing and projected future demand. It is not reasonable for the SED to assume that in addition to the potential 27 mgd (equivalent to 30,244 AF/year) of water supply that may be available to San Francisco from water transfers--which the SFPUC recognizes are contingent on a number of variables, including that there may simply not be water available to purchase in certain dry years--that San Francisco would also be able to rely on water transfers with the Districts to replace the loss of an additional 119,000 AF/year (106.23 mgd) for 6 consecutive years during a protracted drought, assuming the water would even be available for purchase. (SED, at L-21, Table L.4-2.) (San Francisco's actual water supply deficit in this scenario is more severe, i.e., 129,884 AF/year, or 115.95 mgd.) [Footnote 222: WaterMAP at 2 (explaining that "the SFPUC may pursue additional regional drought and non-drought year transfer opportunities, but the yield and availability is contingent upon the opportunity."); id. at 41 (noting that "[t]he water supply available to the SFPUC through transfers will depend largely on the nature and source of the transfer water, and will require further investigation to define more accurately."); id. at 57 (cautioning that "[d]uring drought years, in particular, water transfer opportunities may be limited in duration, quantity, and timing. Water transfers are often short-term and may not be available as a long-term supply planning option. Competition may also increase the price of transfers.".)] The State Water Board's assumption is unreasonable, as it ignores and disregards the SFPUC's water supply planning process, and, more fundamentally, the SFPUC's responsibility to meet the water supply needs of its customers, that necessarily includes consideration of dry year delivery reliability and ability to meet projected future demands.</p>	
1166	68	<p>[From ATT1:] The State Water Board's assumption that it is reasonably foreseeable that San Francisco would be able to obtain replacement water through the development of a large-scale desalination plant located at Mallard Slough is not supported by substantial evidence and the analysis of environmental and economic impacts is inadequate. The State Water Board reaches an unsupported conclusion that the envisioned large-scale desalination plant located at Mallard Slough would be feasible based on the SED's misplaced reliance on two disparate projects. There is no basis for the SED's conclusion that it is reasonably foreseeable San Francisco could obtain a significant source of replacement water supply--to mitigate, at least partially, the massive deficit that it could experience from the State Water Board's implementation of LSJR Alternatives 3 or 4--from a large-scale desalination plant located in Mallard Slough. [Footnote 223: SED at 16-70 (noting that "[u]nder certain LSJR alternatives (i.e., higher unimpaired flow LSJR Alternatives 3 and 4), SFPUC may need multiple new water supplies to augment their current drought supply. One option is</p>	<p>Desalination is included in Chapter 16, Evaluation of Other Indirect and Additional Actions, and in Appendix L, City and County of San Francisco Analyses, because available information indicates that water supply desalination had previously been under consideration as a potential water supply source and thus is a reasonably foreseeable water supply management option to be considered at a programmatic level. Although agencies may elect not to pursue certain actions under particular circumstances, it is reasonable to include certain actions or types of actions in a portfolio of possible water supply management strategies because they were considered in the past and may be appropriate for further consideration depending on future circumstances. The projects noted in Chapter 16 serve as examples of desalination facilities in California, and provide information for the general discussion of the types of environmental impacts that would result from desalination facilities. As stated in Chapter 16, for indirect actions, the analyses in that chapter take into account a reasonable range of environmental, economic, and technical factors, pursuant to Pub. Res. Code, § 21159, subd. (c). As discussed in Master Response 1.1, General Comments, the SED provides a programmatic-level analysis regarding the plan amendments. Other actions taken in response to</p>

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		<p>desalination of ocean or brackish water.".)To reach this conclusion, the SED unreasonably relies on the feasibility, environmental, and economic analyses of two disparate projects, and fails to take into account newly enacted legal requirements that apply to desalination plants in California. The draft's untenable assumptions regarding the relevancy of the comparisons drawn in the SED between the contemplated large-scale desalination plant at Mallard Slough and the referenced projects does not constitute substantial evidence under CEQA. (Pub. Res. Code, § 21080(e)(1-2).)</p>	<p>the plan amendments may also be subject to future project-specific CEQA review by those entities with authority over those projects once they are developed and proposed. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources of water, such as water supply desalination.</p>
1166	69	<p>[From ATT1:] The State Water Board's reliance on prior analyses of the BARDP is misplaced because the site specific analyses contemplated a facility that produces no more than 22,400 AF, and fail to address numerous unresolved potential feasibility concerns. Although the SED references prior analyses of a desalination plant at Mallard Slough in support of their envisioned large-scale facility at the same location, i.e., the 2007 SFPUC Water Supply Options Report ("WSO Report"), the WSIP PEIR, a 2010 report entitled "Pilot Testing at Mallard Slough--Pilot Plant Engineering Report" prepared for the Bay Area Regional Desalination Project ("BARDP"), and the 2014 Bay Area Regional Desalination Project Site Specific Analyses, that included a Site Specific Modeling and Storage Optimization Report [Footnote 224: Bay Area Regional Desalination Project Site Specific Analyses Final Report, Contra Costa Water District, January 2014 (referred to below as "BARDP Site Specific Delta Modeling Report"), available at <a href="http://www.regionaldesal.com/downloads/Bay%20Area%20Regional%20Desalination%20Project%20Site%20Specific%20Analyses%20Final%20Report.pdf">http://www.regionaldesal.com/downloads/Bay%20Area%20Regional%20Desalination%20Project%20Site%20Specific%20Analyses%20Final%20Report.pdf</a>], the draft acknowledges that while demand estimates for the partner agencies were revised numerous times over the course of project planning, none of the site-specific analyses that considered the limitations of existing water rights and infrastructure assessed proposals for a facility that would have a capacity to produce more than 22,400 AF. [Footnote 225: SED, at 16-70 (noting that the WSO Report analyzed a facility with an intake capacity of 28,000 AF/year); id. at 16-72 (explaining that the 2010 pilot plant engineering report "estimated the capital cost for a facility that would use 28,000 AF/y of brackish or ocean water to produce approximately 22,175 AF/y of treated water"); id. at 16-71 ("[p]resently, water supply desalination is being considered for all hydrologic year types under the BARDP at Mallard Slough in the Delta, with an estimated production of 20,900 AF/y."); id. at 16-71 (noting that a "desalination project would likely need to be larger than analyzed in the WSO report, or the BARDP feasibility studies, for LSJR Alternatives 3 and 4."); id. at L-25 (same).]Given that the SED envisions a facility more than double the size of a desalination plant that can be supported with existing infrastructure at the Mallard Slough location, i.e., with a capacity of 56,000 AF, the draft's reliance on these previous analyses of the BARDP is misplaced. [Footnote 226: See e.g., id. at 16-74 (noting that "[a] facility that is larger than the BARDP (e.g., 56,000 AF/y) would have similar types of construction and operation impacts," and, make further comparisons regarding "[t]he types of construction activities associated with a large desalination facility with a capacity of 56,000 AF/y," and the "[l]ong-term operational impacts associated with a large desalination facility with a capacity of 56,000 AF/y . . ."). C.f. SED, at 16-74 ("The increased electrical demand as a result of a larger design capacity (i.e., increase from 28,000 to 50,000 AF/y) could result in increases in GHG emissions and air quality impacts under operating conditions.") Although the exact size of the large-scale</p>	<p>Please see response to comment 1166-68. The SED does not assume that a 56,000 AF/y would be required or considered at Mallard Slough or any other location. In addition, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the programmatic level (vs. project level) of analysis in the SED, and Master Response 1.1, General Comments, for a more detailed discussion of program-level documents and analyses, and related requirements under CEQA.</p>

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		<p>desalination plant at Mallard Slough envisioned in the SED is not clear from the State Water Board’s analysis, based on the number of references to the larger plant size, San Francisco assumes that the State Water Board is contemplating a facility with a production capacity of 56,000 AF/y.] Further, these analyses fail to provide a meaningful basis of comparison for purposes of assessing the feasibility, environmental impacts, or costs of the 56,000 AF/year desalination plant at Mallard Slough envisioned in the SED. The draft recognizes that the referenced analysis in the WSIP PEIR provides only "a conceptual-level, generalized impact analysis of the BARDP, which, at the time of the analysis, was based on limited, preliminary information regarding project design and operation, and site location." (SED, at 16-73.) Inexplicably, the SED makes no attempt to update the prior analyses from almost a decade earlier or to undertake an analysis of a larger facility. [Footnote 227: See id. at 16-73, 16-74 (referencing findings concerning environmental impacts of BARDP in WSIP PEIR); id. at L-25 (wherein the SED relies on the SFPUC’s environmental impact analysis of the BARDP in the WSIP PEIR, as discussed in Chapter 16 of the SED: "[t]he construction and operation of BARDP could result in potentially significant environmental impacts on various resources, as disclosed in Chapter 16 . . . .").] Following preparation of the WSIP PEIR, many subsequent studies have demonstrated the limitations on both institutional and physical capacity of the existing infrastructure to support a desalination facility at Mallard Slough with a production capacity greater than 22,400 AF.] Similarly, the State Water Board’s reliance on the BARDP Site Specific Delta Modeling Report is improper because these analyses of the BARDP operations "were not considered in a comprehensive regulatory setting." (BARDP Site Specific Delta Modeling Report, at 10.) Although the BARDP Site Specific Delta Modeling Report includes a limited entrainment analysis, it does not contain "a comprehensive examination of all of the potential impacts to aquatic resources that could result from BARDP." (Id. at 86.) Instead, the analyses in the BARDP Site Specific Delta Modeling Report were limited to consideration of certain water quality regulations. [Footnote 228: BARDP Site Specific Delta Modeling Report at 10 (explaining that "BARDP operations were evaluated within the context of several key water quality regulations: California State Water Resources Control Board Decision 1641 and California Department of Public Health Secondary Maximum Contaminant Level of Chlorides in drinking water. Changes in compliance with these two regulations were evaluated based on the location of the proposed BARDP facilities and the nature of the operations.").] Accordingly, the report explains, "[e]valuation of BARDP operations in a comprehensive regulatory setting would be required in an environmental impact report." [Footnote 229: Memo from Leslie Moulton-Post Leslie Moulton-Post, Alisa Moore, Karen Lancelle, Chris Mueller, Environmental Science Associates to San Francisco City Attorney’s Office, CEQA Adequacy Review of the Desalination Water Supply Alternative in the Draft Substitute Environmental Document (SED) in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento / San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality, March 15, 2017, attached hereto as Appendix 5 [ATT7] at 5 (explaining that the BARDP Site Specific Delta Modeling Report identified the need for "[f]uture project planning and evaluation studies . . . to more specifically analyze both general environmental impacts of project construction and operation to aquatic species to identify appropriate project design features and mitigation measures and . . . to address impacts to listed species to achieve compliance with state and federal endangered species regulations.").] (BARDP Site Specific Delta Modeling Report, at 10.) Additionally, the BARDP Site Specific Delta Modeling Report raises a number of other concerns regarding a desalination plant located at Mallard Slough with a maximum production capacity of 22,400 AF/year, which is substantially smaller than a plant of the envisioned size of 56,000 AF/year. Issues that would need to be resolved during subsequent phases of project development,</p>	

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		<p>environmental evaluation and permitting, include necessary coordination amongst BARDP partner agencies in sequential-year droughts to address unmet water supply demands from the project and additional modeling to ensure the project would be able to comply with increasingly more stringent Bay-Delta water quality regulations. [Footnote 230: Id. at 3-5.] The SED fails to identify, let alone substantively address, any of these concerns.</p>	
1166	70	<p>[From ATT1:] The State Water Board’s reliance on analyses of the Carlsbad Desalination Project is misplaced because these analyses address a facility located in a disparate geographic area with a distinct source water intake. The SED attempts to address the obvious disparity between the envisioned larger scale desalination plant that could be developed at Mallard Slough, as compared to the prior site specific analyses of a facility at that location, by referencing analyses of the "costs and environmental impacts associated with the larger Poseidon Desalination Facility in Carlsbad" ("Carlsbad Desalination Plant"), that has a capacity of 56,000 AF/year. The SED concedes "there are many geographic differences between the San Francisco Bay-Delta and Carlsbad," and acknowledges that these differences "could influence the significance of an impact on an environmental resource . . . ." [Footnote 231: SED, at L-25 (where the draft explains that the desalination plant at Mallard Slough they envision "would likely need to be larger" than any prior facility analyzed for that location, and thus, rely on analyses for the Carlsbad Desalination Plant to assess the increased costs and environmental impacts associated with a larger facility: "[t]herefore, costs and environmental impacts associated with the Claude ‘Bud’ Lewis Carlsbad Desalination Plant . . . which has a larger capacity, are summarized below."); id. at 16-71 (same); id. at 16-75 (acknowledging "there are many geographic differences between the San Francisco Bay-Delta and Carlsbad").] However, the SED fails to describe in any detail, or draw any conclusions about, the nature of the geographical differences between the San Francisco Bay-Delta and coastal Carlsbad, and to explain how these differences might affect impacts of a similarly sized facility at Mallard Slough. For example, important potential impacts overlooked by the SED are those associated with brine discharge into the ocean as opposed to the already stressed ecosystem of the Delta. [Footnote 232: ESA Tech Memo--Desalination Plant [ATT7] at 8, 11-12.] The draft appears to disregard any difference between a San Francisco-Bay Delta facility and a coastal Carlsbad facility by relying on the 2015 EIR and other findings related to the Carlsbad Desalination Plant to simply conclude "similar environmental impacts were identified for the project-level analyses of the Carlsbad facility." (SED, at 16-75.) Further, the SED ignores the fact that the Carlsbad Desalination Plant has a distinct source water intake as it relies on source water previously diverted by an adjacent power plant. [Footnote 233: See e.g., water-technology.net website, Carlsbad Desalination Project, available at <a href="http://www.watertechnology.net/projects/carlsbaddesalination">http://www.watertechnology.net/projects/carlsbaddesalination</a> (explaining "[s]eawater from the [NRG Energy’s Encina Power Station] used for cooling boilers in operation, is diverted to the desalination facility through an existing cooling water discharge system.").] The power plant intake is located in a constructed lagoon/coastal embayment and the outfall pipeline discharges to the ocean. Because the desalination plant withdraws water from and discharges into "the same seawater outfall pipeline that the power plant uses now," the Carlsbad Desalination Plant EIR concluded that the "effects are essentially the same as current conditions." [Footnote 234: City of Carlsbad California website, FAQs, available at <a href="http://www.carlsbadca.gov/services/depts/pw/utills/desalination/faq.asp">http://www.carlsbadca.gov/services/depts/pw/utills/desalination/faq.asp</a>, attached as Exhibit 29 [ATT37] (explaining that because the desalination plant relies on the power plant’s existing source water intake "[t]he city’s certified EIR concluded that the desalination plant can operate without significant impacts to marine life.")]. See also City of Carlsbad California website, Agua Hedionda Lagoon, available at</p>	<p>Please see response to comment 1166-68.</p>

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		<p><a href="http://www.carlsbadca.gov/residents/fun/lagoons/agua.asp">http://www.carlsbadca.gov/residents/fun/lagoons/agua.asp</a>, attached as Exhibit 30 [ATT38] (describing the lagoon as follows: "[t]he 66 acre outer lagoon, adjacent to the Pacific Ocean, provides cooling water for the power plant, shore fishing and is leased to an aquaculture company cultivating shellfish for a wide-ranging market. The 27 acre middle lagoon is home to the North Coast YMCA Aquatic Park. The 295 acre inner lagoon extends approximately 1,800 yards in a southeasterly direction from the Interstate 5 highway bridge.")]. Thus, the Carlsbad facility did not have to grapple with the intake related entrainment issues associated with a new source water intake that any new desalination plant at Mallard Slough withdrawing water directly from the Delta would have to address. [Footnote 235: Notwithstanding the Carlsbad Desalination Plant's distinct source water intake (and outfall), the facility has still generated environmental controversy. See Gorn, David, Desalination's Future in California Is Clouded by Cost and Controversy, KQED Science, October 31, 2016, available at <a href="https://ww2.kqed.org/science/2016/10/31/desalination-why-tapping-sea-water-has-slowed-to-a-trickle-incalifornia/">https://ww2.kqed.org/science/2016/10/31/desalination-why-tapping-sea-water-has-slowed-to-a-trickle-incalifornia/</a>, attached as Exhibit 31 [ATT 39] (explaining that "[t]he Carlsbad plant isn't even a year old but state officials have cited it a dozen times for environmental violations. That includes what they call 'chronic toxicity,' from an unknown chemical used in water treatment that has been piped into the ocean. The company is still trying to identify, isolate and clean it up.".)]</p>	
1166	71	<p>[From ATT1:] The State Water Board's reliance on prior analyses of the BARDP and Carlsbad Desalination Project is misplaced because those analyses fail to take into account regulatory requirements enacted in 2015 that apply to all new desalination projects. [One] reason that the SED's reliance on prior analyses of the BARDP and Carlsbad Desalination Project is misplaced is that those analyses fail to take into account 2015 amendments to the Ocean Plan that impose regulatory requirements on all new desalination projects in California. For example, the 2015 amendments to the Ocean Plan require consideration of, and include an express preference for, subsurface intakes for any new desalination projects. (Cal. Code Regs., tit. 23, § 3009; SWRCB Resolution 2015-0033.) Indeed, the 2015 Ocean Plan directs the regional water boards, in consultation with State Water Board Staff, to require subsurface intakes unless it is not feasible. (See 2015 Ocean Plan, at III.M.2.d.(1)(a).) The past analyses of the BARDP did not include any analysis of the potential for a subsurface intake at Mallard Slough, and the Carlsbad Desalination Project uses a surface intake. Further, the analyses of the BARDP also fail to take into account the 1.0 mm maximum screen opening size identified in the 2015 Ocean Plan. In fact, the BARDP Site Specific Delta Modeling Report contemplates a surface water intake with screens that have a maximum opening of 2.38 mm. (See BARDP Site Specific Delta Modeling Report, at 72-73.) Therefore, the SED's reliance on the analyses of the BARDP and Carlsbad Desalination Project is improper because the referenced analyses were performed before the State Water Board adopted the 2015 amendments to the Ocean Plan, and neither the current proposal for the BARDP nor the completed Carlsbad Desalination Project comply with the new requirements.</p>	Please see response to comment 1166-68.
1166	72	<p>[From ATT1:] The State Water Board fails to account for other limiting factors that may render their envisioned 56,000 AF/year desalination plant at Mallard Slough infeasible. In addition to failing to address the unresolved issues with a desalination plant at Mallard Slough with a maximum production capacity of 22,400 AF/year identified in the BARDP Site Specific Delta Modeling Report, the SED also fails to account for other limiting factors that may render their envisioned 56,000 AF/year facility infeasible, e.g., the need for a larger source water intake and additional water rights to withdraw the requisite amount of source water from the Delta, and the potential need for a new outfall to discharge the increased amount of brine generated by the larger desalination facility. [Footnote 236: ESA Tech</p>	Please see response to comment 1166-68.

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Ltr#	Cmt#	Comment	Response
		Memo--Desalination Plant [ATT7] at 5-7.]	
1166	73	<p>[From ATT1:] The State Water Board’s environmental analysis of the envisioned 56,000 AF/year desalination plant located at Mallard Slough is woefully inadequate. The SED’s collage of the referenced, prior analyses for the BARDP and Carlsbad Desalination Project does not present an accurate assessment of the feasibility or environmental impacts of the envisioned 56,000 AF/year desalination plant at Mallard Slough. “[I]t is reasonable to expect that a desalination plant at Mallard Slough with twice the intake capacity assumed for the BARDP could have significant unavoidable impacts on biological resources including endangered species, water quality and hydrology, and potentially significant unavoidable impacts related to greenhouse gas and air pollutant emissions.” [Footnote 237: ESA Tech Memo--Desalination Plant [ATT7] at 9; see also id. at 9-11 (summarizing the SED’s failure to adequately address or identify impacts of the larger desalination plant at Mallard Slough envisioned in the draft.)] However, the SED “draws no conclusions as to significance of the impacts” the 56,000 AF/year desalination plant located at Mallard Slough, as envisioned in the SED, would have. [Footnote 238: Id. at 8.] The draft’s untenable assumption regarding the propriety of exclusively relying on the feasibility and environmental analyses of disparate projects--that, in the case of the BARDP, are preliminary and incomplete--in lieu of attempting to discretely analyze the feasibility and impacts of the envisioned 56,000 AF/year desalination plant at Mallard Slough, does not constitute substantial evidence under CEQA. (Pub. Res. Code, § 21080(e)(1-2).) [Footnote 239: See also id. at 9 (explaining that “[t]he inadequacy of the impact analysis thus raises additional questions about the feasibility of the desalination plant anticipated in the [SED] because, given its probable environmental impacts, it is far from obvious such a plant could be permitted.”); id. at 7 (noting that the SED “provides only a vague indication of how these other project analyses might apply to the desalination water supply option the [SED] anticipates would be needed as an ‘additional action’ to address drought-period supply shortfalls under the LSJR Alternatives.”).]</p>	Please see response to comment 1166-68.
1166	74	<p>[From ATT1:] The State Water Board’s economic analysis of the envisioned 56,000 AF/year desalination plant located at Mallard Slough is woefully inadequate. The SED woefully fails to analyze the economic impacts of the 56,000 AF/year desalination plant at Mallard Slough envisioned in the draft, and thereby violates the requirements of the certified regulatory program for the State Water Board’s water quality control planning program and Water Code Section 13241(d). (Cal. Code Regs., tit. 23, § 3777(c) ; Cal. Code Regs., tit. 14, § 15187(d); Pub. Res. Code § 21159(c); Wat. Code, § 13241(d); Attwater Memo [ATT11] at 4). As an initial matter, the SED fails to assess any potential rate impacts associated with the large-scale desalination plant. (SED, at 20-34 [explaining that the State Water Board’s proposal only includes an analysis of “the potential economic effects of purchasing water (i.e., water transfers) by SFPUC from willing sellers in the Central Valley.”].) Further, although the SED includes “[c]ost information” for the other two identified alternative sources of replacement water supplies, (id), the analysis does not even attempt to estimate the capital costs associated with the envisioned larger desalination facility at Mallard Slough, but instead appears to suggest that construction costs would total somewhere within the broad range of \$168 million to \$1 billion. (See SED, at L-25 [noting that in the 2007 WSIP PEIR the SFPUC estimated that the cost to construct the BARDP with a production capacity of 22,400 AF/year, “including the intake and pipeline for conveyance to the existing conveyance system,” would be \$168 million]; id. [explaining that the SED includes “costs and environmental impacts” associated with the Carlsbad Desalination Facility because it has a “larger capacity.”]) Notably, the SED fails to identify the \$1 billion</p>	Please see response to comment 1166-68.



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		<p>capital cost of the Carlsbad Desalination Facility and the annual operation and maintenance costs associated with the facility of approximately \$50 million/year. [Footnote 240: Gorn [ATT39] (explaining that "[b]eyond the environmental cost is the actual price tag: the plant in Carlsbad cost \$1 billion to build, with a rough estimate of \$50 million a year for the power to run it. The estimated cost of the water to San Diego is about \$2,300 dollars an acre-foot--more than double the cost most Southern California cities pay for water. (An acre-foot is enough water to supply one-to-two California households per year.) And ratepayers need to pony up for that water even during rainy seasons when the price of water from more traditional sources plummets."); see also Fikes, Bradley J., State's biggest desal plant to open: What it means, San Diego Union-Tribune, December 13, 2015, <a href="http://www.sandiegouniontribune.com/news/environment/sdut-poseidon-water-desalination-carlsbad-opening-2015dec13-htm1story.html">http://www.sandiegouniontribune.com/news/environment/sdut-poseidon-water-desalination-carlsbad-opening-2015dec13-htm1story.html</a>, attached hereto as Exhibit 32 [ATT40] ("[i]n the early 2000s, the Poseidon plant was estimated to cost about \$270 million, a figure that rose to \$300 million, to \$530 million and finally to about \$1 billion."). Nor does the SED account for the fact that the State Water Board's implementation of LSJR Alternatives 3 or 4 would make it far more difficult, if not impossible, for the SFPUC to pay for the 56,000 AF/year desalination facility at Mallard Slough envisioned in the draft. The SED fails to mention that the Carlsbad Desalination Plant took decades to develop, and, specifically, that 14 years elapsed between the initial feasibility study for the project and construction of the plant. [Footnote 241: See e.g., Fikes, ("Poseidon Water's desalination plant in Carlsbad is poised to begin regular operations within days--decades after water officials first considered harvesting drinking water from the sea and 14 years after they formally took the first steps toward its construction."); see id. (presenting timeline for construction of the project). During periods of heightened water supply rationing, reduction in utility revenues result in increased utility rates or deferred capital projects. If the State Water Board implemented LSJR Alternatives 3 or 4, and San Francisco was responsible for bypassing flow in compliance with a new unimpaired flow objective on the Tuolumne River, it would be compelled to severely reduce deliveries to the RWS service territory and suffer the attendant loss of revenue. This loss of revenue would make it far more difficult, if not impossible, to fund the development of any large-scale capital project, such as the 56,000 AF/year desalination facility at Mallard Slough envisioned in the SED.</p>	
1166	75	<p>[From ATT1:] The State Water Board's conclusion that a 56,000 AF/year desalination plant located at Mallard Slough would simply make up for reduced water supply is not reasonable or logical because it fails to take into account that the SFPUC already relies on yield from the BARDP to meet projected future demand. It is not reasonable for the SED to conclude that the envisioned 56,000 AF/year desalination facility at the Mallard Slough location "would not be built to accommodate an increase in population in the service area" (SED, at 16-73). The SFPUC has identified the BARDP, to the extent that it is ever developed, as a potential new source of additional water supply to meet projected future demand, (WaterMAP, at 1-2 [explaining that to meet "the proposed planning objectives," including meeting "new requests for permanent supply," by San Jose and Santa Clara, the WaterMAP identifies that the SFPUC could pursue desalination, among other options]; id. at 60-63 [describing Bay Area Brackish Water Treatment Project, also referred to as the "Regional Desalination Project," or BARDP].) Specifically, the SFPUC has currently identified the BARDP as a potential, future source of additional yield of up to 9 mgd (10,080 AF) to meet future demand in the RWS service territory, with the possibility, if more capacity is available (assuming that up to 3 other partner agencies take no water deliveries to meet future demands), of securing up to 15 mgd (16,800 AF). (WaterMAP, at 60.) Thus, the SED not only ignores the SFPUC's water supply planning obligations, but also disregards the specific plans</p>	See response to comment 1166-68.

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		<p>the SFPUC has articulated for potentially meeting projected future demand, e.g., in the WaterMAP. The SED does not even attempt to support the conclusion that the envisioned 56,000 AF/year desalination plant at Mallard Slough would only be used to "replace reductions in water supply resulting under the LSJR alternatives," (SED, at 16-70), and "not be built to accommodate an increase in population in the service area," (id. at 16-73). The SFPUC has already considered the potential availability of additional yield from development of the BARDP in its water supply planning to meet projected future water supply needs, not as a source of replacement water supply.</p>	
1166	76	<p>[From ATT1:] The State Water Board’s assumption that it is reasonably foreseeable that San Francisco would be able to obtain replacement water through the development of the identified in-Delta diversion project is not supported by substantial evidence, or reasonable inferences predicated on fact, and the analysis of environmental and economic impacts is inadequate. There is no basis for the SED’s conclusion that it is reasonably foreseeable San Francisco could obtain a significant source of replacement water supply—to mitigate, at least partially, the massive deficit that it could experience from the State Water Board’s implementation of LSJR Alternatives 3 or 4—through the development of the identified in-Delta diversion project. To reach this conclusion, the SED unreasonably (and incomprehensibly) relies on the SFPUC’s prior determination that the same project was infeasible yet offers no additional analysis, facts, or even an explanation as to why this project should now be considered feasible. The draft recognizes that "[i]n the 2008 WSIP PEIR, the SFPUC concluded that the in-Delta diversion option was infeasible, in part, because it would not achieve consistent year-round diversions due to uncertainties regarding the availability of water supplies and pumping capacities . . . ." (SED, at L-24; id. at 16-68 [same].) Although the SED exclusively relies on the SFPUC’s previous analysis of the in-Delta diversion project, it casually brushes off the SFPUC’s prior determination that it was infeasible, stating: "[n]onetheless, a discussion of this possible water supply option has been included in light of the changing circumstances since 2008 (e.g., Pelagic Organism Decline, climate change, California WaterFix, and the State Water Board’s Final Report on the Development of Flow Criteria for the Sacramento Delta Flow Criteria . . . . Thus, it is discussed as a possible option available to the SFPUC that may be explored in the future in light of the changing circumstances." (Id. at L-24.) Yet the draft fails to identify how the referenced "changing circumstances" may affect the feasibility of an in-Delta diversion project. In fact, the list of "changing circumstances" presented in the analysis identifies stricter regulation and/or more restrictive environmental conditions and therefore greater project impacts that would likely make a new in-Delta diversion even less feasible. In short, the SED has failed to address, in any substantive manner, the feasibility issues regarding the in-Delta diversion project that the SFPUC previously identified. [Footnote 242: See Memo from Leslie Moulton-Post and Jill Hamilton, Environmental Science Associates to San Francisco City Attorney’s Office, Adequacy Review of In-Delta Diversion Alternative Analysis in State Water Board SED, March 15, 2017, attached hereto as Appendix 6 [ATT8] (providing a comprehensive evaluation of the adequacy of the State Water Board’s description and analysis of environmental impacts of the in-Delta diversion project contemplated by the SED as a potential source of replacement water supply for San Francisco).] Nor has the draft addressed or even identified other, more recent developments that present additional feasibility concerns, such as the fact that during the interim 9 years since the SFPUC completed its preliminary analysis of the in- Delta diversion project, the SFPUC has developed other WSIP projects on the site contemplated in the SED for the new 18-acre treatment plant and blending facility at Tesla Portal. [Footnote 243: Id. at 2. See SED, at L-24 (explaining that "[t]his project would include a new Delta intake and pumping plant, a new</p>	<p>As discussed in Master Response 1.1, General Comments, the SED provides a programmatic-level analysis regarding the plan amendments. Other actions taken in response to the plan amendments may also be subject to future project-specific CEQA review by those entities with authority over those projects once they are developed and proposed. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board’s evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources of water.</p> <p>Water supply management strategies were included in Chapter 16, Evaluation of Other Indirect and Additional Actions, as reasonably foreseeable categories of strategies to be evaluated at a programmatic level. The analyses in that chapter take into account a reasonable range of environmental, economic, and technical factors. The plan amendments do not direct that any specific indirect action be implemented. Categories of water supply strategies were included in Chapter 16, and in Appendix L, City and County of San Francisco Analyses, because available information indicates they had previously been under consideration and thus are reasonably foreseeable water supply management options to be considered at a programmatic level. Although agencies may elect not to pursue certain actions under particular circumstances, it is reasonable to include them in a portfolio of possible actions because they were considered in the past and may be appropriate for further consideration depending on how circumstances change.</p>

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		<p>pipeline, a new Delta Water Treatment Plan and a new blending facility at Tesla Portal.".)] The SED's untenable suggestion that the project may now be feasible (for some unexplained reason) is mere "[a]rument, speculation, unsubstantiated opinion or narrative," and thus, does not constitute substantial evidence under CEQA. (Cal. Code Regs., tit. 14, § 15384(a)-(b).) The SED also woefully fails to analyze the economic impacts of the larger in-Delta diversion project that the draft envisions, and thereby violates the requirements of the certified regulatory program for the State Water Board's water quality control planning program and Water Code Section 13241(d). (Cal. Code Regs., tit. 23, § 3777(c); Cal. Code Regs., tit. 14, § 15187(d); Pub. Res. Code § 21159(c); Wat. Code, § 13241(d); Attwater Memo [ATT11] at 4). As an initial matter, the analysis fails to assess any potential rate impacts associated with the in-Delta diversion project. (SED, at 20-34 [explaining that the State Water Board's proposal only includes an analysis of "the potential economic effects of purchasing water (i.e., water transfers) by SFPUC from willing sellers in the Central Valley."] Further, although the SED includes "[c]ost information" for the other two identified alternative sources of replacement water supplies, (id), the draft does not even attempt to estimate the cost of compliance associated with the larger in-Delta diversion project that they envision, (id. at 16- 69 [wherein the State Water Board opines that "[t]he size of the project may need to be larger than what was examined in the WSO report which is summarized below."]; id. at 16-68 [wherein the draft speculates that the "cost per AF of additional water from Delta diversion for a larger project could be less than \$255 per AF because of the economies of scale (i.e., the larger infrastructure projects are, the less they cost per unit per year)."]; id. at L-24 (same)). Instead, the SED solely references the preliminary cost estimates previously developed by the SFPUC for a smaller project, i.e., with a design capacity of 28,000 AF/year. (Id. at 16-68 ["[t]his section uses information regarding a Delta diversion project as was analyzed in the WSO report to evaluate costs and potentially significant environmental impacts."].)</p>	
1166	77	<p>[From ATT1:] The SED is Inconsistent in its Treatment of Municipal Water Service Providers Resulting in an Unstable Project Description and Deficient Impact Analysis. The SED's explanation of whether and how various municipal water providers may be required to comply with the State Water Board's proposal is confusing, internally inconsistent, and impermissibly scattered throughout various chapters and appendices. [Footnote 244: See e.g., California Oak Foundation, 133 Cal.App.4th at 1239 (citing Santa Clarita Organization for Planning the Environment, 106 Cal.App.4th 715, 723) [explaining that "information 'scattered here and there in EIR appendices,' or a report 'buried in an appendix,' is not a substitute for 'a good faith reasoned analysis in response [to public comments on an EIR].'"].) As noted, "[a]n accurate, stable and finite project description is the [s]ine qua non of an informative and legally sufficient EIR." (County of Inyo, 71 Cal.App.3d at 193; see also City of Santee, 214 Cal.App.3d at 1454) ["only through an accurate view of the project may the public and interested parties and public agencies balance the proposed project's benefits against its environmental cost, consider appropriate mitigation measures, assess the advantages of terminating the proposal and properly weigh other alternatives."].) The SED fails to present a clear description of the project because it fails to clarify the extent to which municipalities are responsible for complying with the LSJR Alternatives. Instead, the Draft 2016 contains vague, conflicting statements regarding how the LSJR Alternatives will apply to municipalities. For example, some sections of the SED appear to suggest that municipalities are not responsible for complying with the LSJR Alternatives. Specifically, the SED states that the Water Supply Effects model "assumes that municipal water providers would not experience a reduction in surface water supply." [Footnote 245: See SED, at 4-24 (explaining that "[t]he WSE model is a monthly water balance spreadsheet model based on</p>	<p>Please see Master Response 1.1, General Comments, regarding a general discussion of the overall approach to the analyses contained in the SED and the programmatic nature of the analyses. Please see Master Response 1.2, Water Quality Control Planning Process, for a description of the water quality control planning process, implementation of the plan amendments and implementation through water right proceedings. Refer to Master Response 2.1, Amendments to the Water Quality Control Plan, for information regarding the project and adequacy of the project description. Please refer to Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the evaluation of potential impacts to the SFPUC RWS service area and actions that may be taken in response to reduced water supplies.</p> <p>Please see Master Response 3.6, Service Providers, for information regarding Water Code section 106.</p>

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		<p>the CALSIM II analysis framework that calculates for each tributary reductions in water supply diversions and changes in reservoir operations that could occur based upon user-defined diversion and reservoir operating rules, flood storage curves, and minimum river flow requirements, across 82 years of monthly historical watershed hydrology."(SED, at 9-44; see id. at 11-36 [stating that for purposes of modeling groundwater and agricultural impacts, "[v]olumes of water assumed not to be subject to a water shortage (e.g., municipal and industrial water supply, riparian rights) are subtracted from the total diversions for each river to calculate the remaining water."]; see also id. at G-6 ["[f]or a more conservative estimate of the groundwater and agricultural impacts, it is assumed that municipal deliveries would not be cut in times of surface water shortage. This is a simplifying assumption based on the program of implementation in Chapter 3, Alternatives Description, which describes actions to assure that implementation of the LSJR alternatives (i.e., percent of unimpaired flow requirement) does not impact supplies of water for minimum health and safety needs."].)</p> <p>[Footnote 246: SED, at G-6 (explaining that "[t]here is one exception to the analytical assumption that all municipal demands for surface water would be met. In the WSE model, SEWD and CSJWCD diversions from the Stanislaus River are calculated separately from the [South San Joaquin Irrigation District or 'SSJID'] and [Oakdale Irrigation District or 'OID'] diversions because they only receive water after SSJID and OID water rights have been met. As a result, in some years SEWD is not able to meet its municipal demand for Stanislaus River water, which is assumed to be 10 TAF/y . . . . These municipal needs, however, could be met by either Calaveras River water or groundwater."]; see also Bay-Delta Phase 1 Staff Technical Workshop of December 5, 2016, Transcript of Video Recording, attached hereto as Exhibit 33 [ATT41] (referred to below as "December 5th Workshop Transcript"), at 86:18-25 [where Mr. Anderson explained that in the "[water supply] effects analysis, we have not modified the available surface water to the water treatment plants. Those are fixed quantities, and that is a component of demand. And so, essentially, when there is decreased availability, that would--that would fall on the irrigation districts rather than on the municipalities in terms of our effects analysis."].)Although the SED appears to justify excepting municipal water service providers from compliance with the proposed flow objectives by referring to Water Code Section 106, the explanation provided in the analysis is ambiguous and obscure: "[a]lthough California recognizes water for domestic purposes as the most important use of water and irrigation as the next most important use (Cal. Code Regs., tit. 23, § 106), this does not necessarily mean that the water supply for domestic uses cannot be modified." (SED, at 13-61.) [Footnote 247: December 5th Workshop Transcript, supra note 246, at 87:1-9 (where Anne Huber, a Water Resources Analyst with ICF Jones &amp; Stokes, described how the analysis treats municipalities as follows: "for service providers, we analyze impacts qualitatively because we are--you know, it is uncertain at this point to what degree their demands may be cut. So there is some consideration of potential reductions in supply to service providers, but it was not part of the groundwater analysis. For the groundwater analysis, the assumption was that all reduction and supply effected agriculture."].)Thus, it remains unclear whether the SED is treating particular municipal water service providers, such as San Francisco, as entities that are responsible for complying with the State Water Board's proposal. Confusingly, other passages and sections of the SED appear to contemplate that municipal water service providers are responsible for complying with the proposed unimpaired flow objectives. (SED, at G-6 [noting that "[p]otential impacts on municipal and industrial water users are evaluated in Chapter 13, Service Providers"; id. at 13-58 ["[t]his chapter provides a programmatic-level analysis of the impacts on service providers and refers to Chapter 16, Evaluation of Other Indirect and Additional Actions</p>	

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		(Section 16.4), with respect to environmental impacts caused by service provider actions associated with various methods of compliance. Service providers may choose any method of compliance described in Chapter 16, or a combination of methods, or they may identify another as-yet unknown method of compliance to comply with requirements from the revised objectives.".)	
1166	78	[From ATT1:] Appendix L states "[San Francisco or 'CCSF'] may be one of the entities responsible for implementing an unimpaired flow requirement. The principal means by which CCSF would be responsible are [if] [r]esponsibility is assigned specifically to CCSF in a proceeding amending the agency's water rights [or] [r]esponsibility is assigned to MID and TID in a proceeding amending the districts' water rights, and the SFPUC's water availability is determined by agreements with the irrigation districts." (SED, at L-4; see also id. at ES-24 [noting that "water right implementation of the flow proposal could affect CCSF and related service water suppliers"]; id. at 20-27 ["i]n addition to potential effects within the plan area, implementation of the LSJR alternatives under drought conditions could result in water supply reductions within the SFPUC retail service area, and within the service areas of the 27 agencies in Alameda, San Mateo, and Santa Clara Counties that purchase wholesale water from SFPUC."]; id. at 20-34 ["LSJR Alternatives 2, 3, and 4 may affect the amount of surface water diversions to the SFPUC service area."].)	Please see the response to comment 1166-77.
1166	79	[From ATT1:] The SED concedes that San Francisco would experience "substantial" water supply reductions if the State Water Board implemented its proposal. (SED, at 13-60) ["[a]t 30 percent unimpaired flow under LSJR Alternative 2 with adaptive implementation method 1, the average percent reduction in water supply on the Stanislaus, Tuolumne, and Merced Rivers was estimated to be 5 percent, 7 percent, and 10 percent, respectively. Thus, surface water supply reductions would be greater at the 30 percent unimpaired flow level compared to 20 percent unimpaired flow. Reductions would be greatest for service providers receiving Merced River diversions (i.e., Merced ID), but would also be substantial for Tuolumne River service providers (i.e., TID, MID, and CCSF)."] [Footnote 248: Perplexingly, elsewhere in the SED, while discussing municipal water service providers that rely on the Tuolumne River, the draft fails even to reference either San Francisco or its wholesale customers. (SED, at G-6 ["m]unicipal and industrial water suppliers use a relatively small portion of the total surface water diversion from the Stanislaus and Tuolumne Rivers. . . . On the Tuolumne River, the City of Modesto has an agreement with MID to purchase surface water from the district."].)]What is clear is that although the SED explicitly identifies impacts to some municipal water supply providers, the draft fails to identify impacts to all of the potentially affected entities, including San Francisco in any coherent fashion. The SED recognizes that reduction in municipal water supply is an impact that the State Water Board must analyze. (SED, at 13-49 ["[w]hile substantially reducing existing surface water supplies of service providers can be considered an impact, the extent to which 248 service providers are affected is a function of their ability to use existing alternative supplies (e.g., groundwater) or develop alternative water supplies."].) The SED appropriately analyzes potential impacts to the Central Valley Project ("CVP") and State Water Project ("SWP") export service areas, yet fails to include any such impact analysis for many other municipal water service providers, including San Francisco. (SED, at 13-87-13-89.) [Footnote 249: See SED, at ES-95, SP-3 (stating that impacts to the CVP/SWP export service areas would be less than significant under LSJR Alternatives 3 and 4 because under these alternatives there would be an average increase in exports of 76 TAF or 194 TAF, respectively). Significantly, by failing to include a comparable summary of impacts from the State Water Board's proposal to other potentially affected water service providers, including	Please refer to Master Response 1.1, General Comments, as well as Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding adequacy of the approach to the analysis, and the programmatic nature of the environmental impact analysis. Please see Master Response 1.2, Water Quality Control Planning Process, for a description of the water quality control planning process and implementation of the plan amendments.

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Ltr#	Cmt#	Comment	Response
		<p>San Francisco, the State Water Board violated Section 15132(b)(1) of Title 14 of the California Code of Regulations, that requires "[e]ach significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect" to be identified in the Executive Summary.'] However, as San Francisco has previously explained, "[i]t is inconsistent and unreasonable for the draft SED to analyze impacts to service providers relying on CVP/SWP exports and to ignore impacts to service providers relying on the same water resources developed upstream of the rim dams." [Footnote 250: 2013 CCSF Comment Letter at 9.]</p>	
1166	80	<p>[From ATT1:] Although the SED in scattered locations posits that: San Francisco may be responsible for implementing the proposed unimpaired flow requirement (id. at L-4); the impacts to San Francisco would be "substantial," (id. at 13-60); and substantial reductions of existing surface water supplies constitute an adverse impact, (id. at 13-49), the draft nevertheless fails to identify, let alone analyze, the adverse impacts to the Bay Area that could result from implementation of the State Water Board's proposal. The SED thereby avoids any comprehensible, substantive discussion in the Project Description, or elsewhere, of how the State Water Board's proposal may impact San Francisco--and many other potentially affected municipal water service providers--by leapfrogging over an analysis of the impacts that would result from the proposed draconian water supply reductions. Instead of acknowledging that a reasonably foreseeable consequence of the State Water Board's implementation of an unimpaired flow objective on the Tuolumne River, as proposed in the SED, would be reduced water deliveries throughout the Bay Area and consequent adverse environmental impacts, the draft limits any analysis of adverse impacts to the Bay Area to those impacts associated with mitigation, i.e., that would result from the construction of new water supply facilities [Footnote 251: See e.g., SED, at ES-93, SP-1 (explaining that as a result of "[s]urface water diversion reductions on the Stanislaus, Tuolumne and Merced rivers" under LSJR Alternatives 3 or 4, and the consequent "substantial reduction of surface water supply on the rivers, it is expected that there would be a substantial depletion of groundwater supplies in the Modesto, Turlock, and Extended Merced Subbasins," and that to the extent such reductions require water service providers "to construct new or expanded water supply or wastewater treatment facilities," the construction of such facilities could result in significant environmental effects.")], or a municipal water service provider's failure to replace their reduced supply. The SED simply assumes that the SFPUC will not need to reduce deliveries to the RWS [Regional Water System] service territory in response to the State Water Board's implementation of LSJR Alternatives 3 or 4, but instead will be able to replace the reduction in water supply from alternative sources, (see SED, at L-26; id. at 20-40), and thereby avoid analyzing the predictable, adverse impacts to the Bay Area. This glaring omission violates the substantive standards of CEQA, the requirements of the certified regulatory program associated with the State Water Board's water quality control program, and the Porter-Cologne Act.</p>	<p>Please refer to Master Response 1.1, General Comments, as well as Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding adequacy of the approach to the analysis, and the programmatic nature of the environmental impact analysis. Master Response 8.5 also provides information regarding the analysis of impacts to the SFPUC RWS service area due to potential water supply reductions resulting from implementation of the plan amendments.</p>
1166	81	<p>[ATT2: Report by City and County of San Francisco, San Francisco Public Utilities Commission. "Alternative to promote the expansion of fall-run Chinook salmon and Oncorhynchus mykiss populations in the lower Tuolumne River while maintaining water supply reliability." March 2017.</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>
1166	82	<p>[From ATT2:] Habitat Management: Coarse Sediment Augmentation Issue Description: Spawning gravel studies (Stillwater Sciences 2013a and McBain &amp; Trush 2004) report downstream movement and loss of spawning gravels on the lower Tuolumne River. Stillwater Sciences (2013a) reported a relatively slow loss of coarse sediment in a 12.4-mile</p>	<p>Please see Master Response 2.4, Alternatives to the Water Quality Control Plan Amendments, for a discussion of the alternatives considered in the SED and alternatives proposed by commenters.</p>

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>long reach below La Grange Dam. From river mile (RM) 45 to RM 52, there was a reported loss of roughly 8,000 tons of coarse material between 2005 and 2012. High flow events in 2006 and 2011 locally scoured the bed and redistributed fine and coarse sediment. Stillwater Sciences (2013a) indicates that at a flow of approximately 225 cubic feet per second (cfs), current spawning gravel theoretically supports 25,000 to 30,000 female fall-run Chinook spawners and 800,000 O. mykiss between RM 23 and 52. However, fall-run Chinook salmon population modeling (Stillwater Sciences 2013b) suggests that fall-run Chinook spawning may become limiting at escapements in excess of approximately 10,000 female spawners due to superimposition and preference for upstream locations. Additional gravel in the upper reaches of the lower Tuolumne River should provide capacity for larger escapements. Resource Goals: Increase spawning habitat quantity and quality throughout the gravel-bedded reach; increase capacity and productivity of spawning habitat. Measure: Undertake a two-phase, ten-year program of gravel augmentation from RM 39 to RM 52 (Figure 1 [ATT2:ATT1]); conduct annual fall-run and O. mykiss spawning surveys; conduct a repeat spawning gravel study (similar to Stillwater Sciences 2013a) in 10 years to identify and guide the scope of future actions. The total five-year Phase I program could contribute approximately 70,000 cubic yards of coarse sediment, or 100,000 tons as compared to a loss over eight years of 8,000 tons, or 1,000 tons/year. The Phase II program would use monitoring data to make determinations on future locations and quantities. Potential Implementation Issues: During placement, turbidity levels will increase. However, if placement coincided with smolt outmigration, this may produce a positive result by potentially reducing predator sight feeding effectiveness. Cost: Capital and monitoring costs of \$17,000,000 over ten years. [Footnote 1: The assignment of costs associated with implementing the SFPUC alternative has not been determined.]</p>	
1166	83	<p>[From ATT2:] Experimental Gravel Cleaning Issue Description: Spawning gravel studies (Stillwater Sciences 2013a and McBain &amp; Trush 2004) report quality of spawning gravels can be adversely affected by in-filling of coarse sediment by fines which can impede hyporheic flows through redds and affect egg viability. Resource Goals: Improve quality of spawning gravels through a program of experimental gravel cleaning to remove fine sediments. The primary sources of these fine sediments are intermittent tributaries (e.g., Peaslee and Gasburg creeks) entering the lower Tuolumne River below La Grange Diversion Dam. Measure: Conduct a five-year program of experimental gravel cleaning using a gravel ripper and pressure wash operated from a backhoe to reduce embedded fine sediment in spawning gravels between RM 42 and 52 (Figure 1 [ATT2:ATT1]). Each year of this experimental method would consist of three weeks of cleaning preselected gravel patches coinciding with May pulse flows and smolt outmigration to provide increased turbidity, potentially reducing predation. Cleaned areas will be monitored each year following gravel cleaning. Gravel cleaning operations in high infill areas integrated with pulse flows will maximize benefit to outmigrating salmon by inducing a sediment plume. Gravel cleaning areas will be coordinated with redd surveys to minimize impact to O. mykiss. Gravel cleaning has the potential to expand availability of high quality gravel, which would improve spawning and egg incubation for fall-run Chinook and O. mykiss. Lower Tuolumne River field experiments using emergence traps showed average egg to emergence survival of 32% (TID/MID 1992b). New gravel is assumed to provide 50% emergence survival and cleaned gravel emergence survival is assumed to be 40% based on TID/MID (1992b). No direct estimates of survival to emergence for gravel augmentation sites are available for the Tuolumne. Potential Implementation Issues: For short periods, increased turbidity may exceed state water quality standards, but the benefits to spawning success and smolt survival are likely to outweigh any lasting effects of short-term increased turbidity. Cleaning</p>	Please see response to comment 1166-82 regarding alternatives proposed by commenters.

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>performed in May to avoid impacts to remaining O. mykiss redds. Redds are located at riffles, which are likely not subject to silt deposition. Cost: Capital and monitoring cost of \$2,400,000 over five years.</p>	
1166	84	<p>[From ATT2:] O. mykiss Habitat Complexity Issue Description: Large Woody Debris (LWD) is limited in the lower Tuolumne River (Stillwater Sciences 2013c). LWD captured by Don Pedro Reservoir does not possess the size that would constitute favorable LWD-induced habitat in the lower Tuolumne River. The role of LWD in habitat formation decreases with increases in channel width; average lower Tuolumne River width is 119 ft (Stillwater Sciences 2013c). Of the 505 pieces tallied by Stillwater Sciences (2013c) within Don Pedro Reservoir and below La Grange Dam, none were longer than 52 ft and 80% of LWD within the lower Tuolumne River was located in habitat not preferred by O. mykiss (runs and pools). However, O. mykiss spawning and rearing habitat in the upper reaches of the lower Tuolumne River could potentially be improved by introduction of suitably sized boulder material for the purpose of introducing greater instream structure and complexity. Interstitial spaces in cobble and boulder substrate are a key attribute for O. mykiss winter habitat suitability (Hartman 1965; Chapman and Bjorn 1969; Meyer and Griffith 1997). Juvenile O. mykiss, adult O. mykiss, and juvenile Chinook salmon are expected to benefit from the increased habitat diversity, cover, and localized hydraulic complexity that introduced boulder material would provide. Resource Goals: Increase complexity of physical instream habitat between RM 42 and RM 50 to primarily benefit juvenile O. mykiss. Measure: Source and place boulder-size stone between RM 42 and 50 (see Figure 1 [ATT2:ATT1]). The program would take place over five years and consist of boulder placement in select sub-reaches each summer followed by monitoring through the next fall and spring to evaluate use. Annual snorkel surveys would be conducted to examine boulder habitat use and localized substrate conditions. Boulder size would be approximately 1- to 1.5-cubic yards. Stream margin placement would be preferred; suitably sized LWD may be added to boulder areas to increase complexity. Potential Implementation Issues: Boulder placement could potentially interfere with recreational use. Selection of sub-reaches for placement and location of boulders should be accomplished with input from a team of biologists, engineers, and recreational users. Cost: \$1.7 million over five years.</p>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters.</p>
1166	85	<p>[From ATT2:] Riparian Vegetation Planting Issue Description: A stream's riparian corridor provides benefits to freshwater aquatic systems and the biota that live within and around it (Welsch 1991). Physical conditions and processes in the lower Tuolumne River currently support natural recruitment of some native riparian species, such as narrow-leaf willow and box elder, while other native riparian plants, such as Fremont cottonwood Goodding's black willow, and other willow species show limited natural recruitment (Stillwater Sciences 2013d). Limited recruitment of these species outside of actively replanted restoration areas is evidenced by the lack of young cohorts observed during both the 1996 and 2012 riparian vegetation field surveys (McBain &amp; Trush 2000 and Stillwater Sciences 2013d). However, the growth and survival of these species in large, actively replanted restoration sites (e.g. Grayson Ranch and Big Bend) demonstrate that active restoration can be a workable means of bringing these native community types back to the lower Tuolumne River. Resource Goals: Maintain and expand native riparian vegetation community types along the lower Tuolumne River. Measure: Provide a lump sum of \$500,000 for the purpose of implementing a focused native riparian vegetation planting program. The program should focus on native riparian species such as Fremont cottonwood, Goodding's black willow, shining and red willow, which exhibit lower rates of natural recruitment. At a replanting cost assumed to be \$3,000/acre, this measure would support restoration of 12 miles of shoreline assuming a</p>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters.</p>



Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		100-foot-wide shoreline zone. Potential Implementation Issues: Landowner cooperation and approval must be obtained. Cost: One time cost of \$500,000.	
1166	86	[From ATT2:] Water Hyacinth Issue Description: Infestations of water hyacinth ( <i>Eichhornia crassipes</i> ) can adversely affect water quality, adult salmon migration, salmon outmigration monitoring, and other uses of the river including recreation. Dense growths of water hyacinth can obstruct and disrupt the adult fall-run Chinook salmon migration, and may be a significant factor influencing salmon escapement counts in the SJR tributaries (TID/MID 2014 and FishBio 2014). Resource Goals: Assist California Department of Boating and Waterways with water hyacinth removal efforts on the lower Tuolumne River to reduce hyacinth's effects on native aquatic resources and uses affected by water hyacinth infestations. Measure: Provide monetary or personnel support for water hyacinth removal efforts on the lower Tuolumne River. Potential Implementation Issues: None identified. Cost: \$100,000/year during years when uses are significantly impaired.	Please see response to comment 1166-82 regarding alternatives proposed by commenters.
1166	87	[From ATT2:] Predation Management: Fish Counting & Barrier Weir Issue Description: Monitoring studies (snorkeling and seine surveys) and predation studies conducted in 1992 and 2012 (TID/MID 1992a and FishBio 2013a) indicate a persistent and substantial population of nonnative fish species, including black bass and striped bass, in the lower Tuolumne River. Striped bass have been documented ranging throughout the lower Tuolumne River, up to La Grange Diversion Dam. Striped bass are highly mobile and account for approximately 15% of the loss due to predation on the lower Tuolumne River (FishBio 2013a). Low juvenile Chinook salmon survival has been documented on the lower Tuolumne River, and predation by non-native predators appears to be a major contributor to high rates of juvenile mortality (FishBio 2013a). From 2007 through 2013, the smolt survival index [Footnote 2: Computed as the percent of smolts passing the Waterford rotary screw trap (RST) (located at RM 29.8) divided by the percent of smolts passing the Grayson RST (located at RM 5.2). The fry survival index is computed similarly.] on the lower Tuolumne River averaged 9.5%, and ranged from 2.7% to 28%. From 2008 through 2013, fry survival index averaged 5.4%, and for four of the years was less than 1%. A recent otolith study indicates fry leaving the Tuolumne River are poorly represented in future escapement, indicating a potential survival advantage for fish emigrating at larger sizes (Stillwater Sciences 2016). Resource Goals: Manage the adverse impact of predation by non-native bass on fall-run Chinook salmon. A corollary benefit would likely be reduced predation on juvenile <i>O. mykiss</i> . Measure: A permanent counting and barrier weir would be installed at RM 25.8 (Figure 1 [ATT2:ATT1]), and will serve multiple purposes. The weir would prohibit the upstream movement of striped bass (primarily) and other bass species into the prime rearing areas for juvenile Chinook and <i>O. mykiss</i> . By preventing bass movement upstream of RM 25.8, predation above that point is expected to be reduced. Striped bass will likely congregate below the barrier, and would be the target of suppression and removal efforts (see predator suppression and removal measure below) prior to spring outmigration pulse flows. Installation of the weir, combined with implementation of the predator suppression and removal measure described below is expected to reduce predation on lower Tuolumne River juvenile Chinook. The permanent weir will have other benefits, including acting as the new counting weir, which would be usable year round and not require removal when flows exceed 1,500 cfs. The 5 foot high weir will include a Denil-type fishway and counting window, allow species separation, and provide a salmon viewing opportunity for the public. Potential Implementation Issues: The weir may be viewed to be in conflict with river recreation, but this is not necessarily the case. The weir would be fitted with a safe passage chute for non-motorized craft, and not require a portage. Motorized craft would be	Please see response to comment 1166-82 regarding alternatives proposed by commenters.

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>excluded but such use is low under present conditions. Cost: Capital cost of \$12 million; monitoring cost of \$320,000/year. Predator Suppression and Removal Issue Description: See issue description in Fish Counting &amp; Barrier Weir measure above. Resource Goals: Substantially reduce the adverse impact of predation by non-native fish on fall-run Chinook salmon. A corollary benefit would likely be reduced predation on juvenile <i>O. mykiss</i>. Measure: Non-native bass species would be targeted for active removal above and below the barrier weir (Figure 1 [ATT2:ATT1]). Removal efforts directly below the barrier weir would increase immediately before implementing an outmigration pulse flow. Removal efforts may include derbies and bounties. Other efforts would include advocating for season extensions, higher bag limits, and smaller catchable size. These efforts, if successful, would likely reduce bass abundance, particularly above the barrier weir, and over time, improve fall-run Chinook juvenile survival. Based on 2012 population estimates (FishBio 2013a), to remove 10% of the current black bass population would require capture of about 660 fish. Monitoring would consist of black bass abundance surveys every three years. Potential Implementation Issues: Parties interested in striped bass and black bass fishing may object to changes in regulations and potential population reductions. Cost: Capital cost of \$150,000; annual cost of \$115,000/year.</p>	
1166	88	<p>[ATT2:ATT1: Figure 1. Map of selected SFPUC alternative habitat and predation management measures.]</p>	<p>Please see response to comment 1166-82. This attachment was provided in support of their comments.</p>
1166	89	<p>[From ATT2:] Environmental Flow Management All proposed releases described below would be made from Don Pedro Reservoir; accretion is not assumed to contribute to meeting the proposed release requirements. All cited weighted useable area (WUA) percentages are derived from Stillwater Sciences (2013e). Water year typing: The instream flow schedule described below uses the 5 water year types of the San Joaquin Valley Water Year Hydrologic Classification, as defined in the current Bay-Delta Water Quality Control Plan (Revised Water Right Decision 1641, SWRCB 2000). Summer <i>O. mykiss</i> Rearing (June 1-September 30) Issue Description: Monitoring indicates that rainbow trout (<i>Oncorhynchus mykiss</i>, or <i>O. mykiss</i>) are generally found in habitats upstream of RM 42 with peak fry densities occurring in May, June, and possibly into July (Stillwater Sciences 2013f, 2013g). Summertime flow management for <i>O. mykiss</i> juveniles requires striking a balance between hydraulic and temperature habitat suitability. Higher flows in early summer (June through mid- July) tend to push weaker-swimming fry to downstream areas, increasing their vulnerability to predation and subsequent higher temperatures (Stillwater Sciences 2013f, 2013g); thus, lower flows are incorporated into this flow measure from June 1 to July 15, with slightly higher flows from July 16 to September 30. Resource Goals: Increase and maintain the lower Tuolumne River <i>O. mykiss</i> population by balancing habitat capacity with summer water temperature management in the predominant <i>O. mykiss</i> reach of RM 42 to RM 50. Measure [Footnote 3: Turlock Irrigation District (TID) has installed an infiltration gallery (IG) at about RM 25.9. The proposed <i>O. mykiss</i> rearing flows are conditioned on TID using the IG to recapture a portion of the summertime flows: 50 cfs would be withdrawn from June 1 to July 15 during BN, AN and W water years, and up to 100 cfs would be withdrawn during all water years from July 16 to Sept 30. <i>O. mykiss</i> typically occupy the reach between RM 42 and 50 during the summertime period, thus the infiltration gallery would likely not impact core <i>O. mykiss</i> habitat.]: From June 1 to July 15 (<i>O. mykiss</i> fry rearing)</p> <p>-W, AN, BN water years--150 cfs (78% WUA)</p>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters.</p>

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>-D, C water years--100 cfs (85% WUA). From July 16 to September 30 (O. mykiss juvenile rearing)</p> <p>-W, AN, BN water years--250 cfs (96% WUA)</p> <p>-D, C water years--175 cfs (99% WUA). Fall-Run Chinook Spawning (October 1 through December 15) Issue Description: Improved spawning success is expected to increase the number of juveniles, which will promote increased outmigration numbers. Resource Goals: Improve spawning habitat for adult fall-run Chinook. Mid-October through mid-December is the primary spawning period for fall-run Chinook. Combined with measures to improve quantity and quality of spawning gravels, this flow schedule improves overall spawning habitat. Improved spawning success will increase the number of juveniles, which will promote increased outmigration numbers. Measure: In 2012, 95% of all redds were established between October 29 and November 29 (FishBio 2013b). Peak spawning occurred the week of November 12. In 2012/2013, 1.4% of redds were documented after December 15 and in 2014/2015, it was 5.8%. At a flow of 250 cfs, spawning habitat is 95% of maximum WUA and at 175 cfs it is 80% of maximum WUA. From October 1 to December 15</p> <p>-W, AN, and BN water years--250 cfs</p> <p>-D and C water years--175 cfs Fall-Run Chinook Fry-Rearing (December 16 through February 28) Issue Description: Many fall-run Chinook leave the Tuolumne River as fry, which are not well represented in returning adults (&lt;5%) (Stillwater Sciences 2016). In recent years, parr and smolt sized emigrants represented the vast majority of returning Tuolumne-origin adults, implying a survival advantage for fish emigrating at larger sizes (Stillwater Sciences 2016). Retaining more fry in the upper river reaches of the lower Tuolumne River to grow to smolt size is expected to increase natural escapement, other factors being equal. Fry habitat is not a factor limiting Chinook populations on the lower Tuolumne River (Stillwater Sciences 2013b). Resource Goals: Increase suitable fry rearing habitat in the lower Tuolumne River; increase the number of fry remaining in the upper reaches of the lower Tuolumne River. Measure: Fry emergence peaks in late January through mid-February (Stillwater Sciences 2013b, 2013f). Fry habitat is greatest at 50 cfs, and decreases to 88% WUA at 100 cfs and at 150 cfs it is 75%, continuing to decrease at higher flows. Long term seining data since 2001 shows higher flows during the fry rearing period tend to push fry downriver, increasing vulnerability to predators and higher temperatures in May (Stillwater Sciences 2013b). In-channel fry habitat is not limiting in the gravel bedded reaches of lower Tuolumne River at these flows. For the period December 16 to February 28:</p> <p>-W, AN, and BN water years--175 cfs</p> <p>-D and C water years--150 cfs Potential Implementation Issues: Reducing flows for the benefit of the fry life stage has the potential to affect egg viability of late spawners. However, based on spawning surveys and depth of redd pots, the small change in stage is unlikely to affect localized flows or result in desiccation. Monitoring will be required to confirm spawning timing and minimize impact to egg viability. Cost: Redd surveys and egg viability monitoring at a cost of \$50,000/year. Fall-Run Chinook Juvenile Rearing (March 1-April 15) Issue Description: Increasing the population of rearing juvenile salmon in the upper reaches of the lower Tuolumne River will increase number of smolts and outmigration numbers. Resource Goals: Increase suitable juvenile rearing habitat in the gravel bedded reaches of the lower Tuolumne River; increase the number of juveniles remaining in the upper reaches of the lower Tuolumne River. Measure: Hydraulically suitable habitat for</p>	

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>juvenile fall-run Chinook rearing is maximized at 150 cfs and exceeds 97% WUA at flows from 100 to 200 cfs. Juvenile habitat at these flows is not limiting. The majority of in-river Chinook have reached at least parr size by the end of March (Stillwater Sciences 2013b). Juveniles have substantially better swimming ability and river temperatures are also favorable during this time period (Stillwater Sciences 2013b, 2013f). From March 1 through April 15:</p> <p>-BN, AN, W water years--200 cfs</p> <p>-D and C water years--150 cfs Potential Implementation Issues: Greater numbers of O. mykiss may be spawning during this time frame. At 200 cfs, spawning habitat it is just under 80% of maximum WUA. At 400 cfs it is 98%; however, Chinook juvenile habitat is reduced to 80% of maximum at 400 cfs. Fall-run Chinook Outmigration Baseflow (April 16 through May 31) Issue Description: Increasing the population of rearing juvenile salmon in the upper reaches of the lower Tuolumne River will increase number of smolts and outmigration numbers. Resource Goals: Maintain favorable conditions in the upper reaches of the lower Tuolumne River for juvenile salmon, including growth and reduced predation (in combination with predation management measures). Measure: Hydraulically suitable habitat for juvenile fall-run Chinook rearing is maximized at 150 cfs and exceeds 97% WUA at flows from 100 to 200 cfs. At 250 cfs, it drops to 92%. Many fall-run Chinook are large parr by mid-April. Juvenile habitat at these flows is not limiting. Increasing flows above those provided through April 15 serve to keep river temperatures favorable. For example, at RM 29, a flow of 250 cfs maintains river temperatures below 24°C until maximum daily air temps exceed 85°F. At these flows, O. mykiss spawning habitat will increase from 78% to 87% of maximum WUA. From April 16 to May 31:</p> <p>-BN, AN, W water years--250 cfs</p> <p>-D and C water years--175 cfs Outmigration Pulse (April/May) Issue Description: All other factors being equal, greater numbers of outmigrants should result in greater and more consistent numbers of returning adults. Resource Goals: Increase outmigration success of fall-run Chinook salmon in the Tuolumne River. Measure: With the onset of smoltification, juveniles will emigrate volitionally or due to one or more hypothesized cues. To encourage this movement and to increase survival, pulse flows would be provided which are carefully timed to coincide with the periods when large numbers of fish are of large parr or smolt size, circa &gt;65 mm. Included in this measure is the close monitoring of spawning timing and river temperatures, supplemented by snorkel surveys or seining, to calibrate size-at-smoltification for the purpose of timing the spring pulse flows. RST monitoring would continue to inform estimated smolt survival in response to pulse flows. Timing pulse flows to when large numbers of juveniles are likely motivated to move, combined with spawning gravel improvements and predator control measures, is expected to substantially improve Tuolumne River outmigration survival. The pulse flow volumes are as follows:</p> <p>-W and AN WYs--150 TAF</p> <p>-BN and D WYs--100 TAF</p> <p>-First year C WY--35 TAF, subsequent sequential C WYs--11 TAF Potential Implementation Issues Balancing with O. mykiss use of river habitats for spawning and rearing. Adding habitat complexity may reduce potential effects. Cost Monitoring costs are approximately</p>	

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		\$300,000 per year.	
1166	90	<p>[From ATT2:] Gravel Mobilization Issue Description: Spawning gravel studies (Stillwater Sciences 2013a and McBain &amp; Trush 2004) report reductions in quality of coarse sediment due to reduced scale and frequency of high flows. Gasburg and Peaslee creeks are likely sources of fine sediment causing gravel infilling, which can impede hyporheic flows through redds and reduce egg viability. Under past and present flow regimes, gravel mobilization occurs less frequently than under pre-project conditions due to a reduced frequency of high flow events as a result of the Don Pedro Project's flood control purposes. Resource Goals: Improve the quality of spawning gravels via more frequent gravel mobilization and transport releases. Increasing the frequency of gravel mobilization events is expected to enhance fall-run Chinook and O. mykiss productivity by periodically flushing accumulated fines from spawning gravels. Measure: During Wet ("W") and/or Above Normal ("AN") water years when adequate spills are forecasted to be available, provide two to four days of releases between 6,000 and 7,000 cfs as measured at the La Grange USGS gage to mobilize spawning gravels. This measure will increase the frequency of gravel mobilization compared to existing spill operations. Bedload transport measurements on the Trinity River in northern California and Rush Creek in eastern California show that coarse and fine bedload transport rates are steady for 2-3 days, then drop by 50% or more thereafter (McBain &amp; Trush 2006). Minimum thresholds for significant bed mobility at Riffle 4B on the lower Tuolumne River are estimated to be between 5,400 and 6,880 cfs (McBain and Trush 2000, 2004). Potential Implementation Issues: Flows in this range have been reported to affect crop production in certain areas below RM 10. Cost: Operational and monitoring cost of \$10,000 per year.</p>	Please see response to comment 1166-82 regarding alternatives proposed by commenters.
1166	91	<p>[From ATT2:] Hatchery Management Issue Description: Current management of production hatcheries in the Central Valley is incompatible with any effort to increase and maintain natural populations of fall-run Chinook salmon. Since the 1980s the state's hatcheries, in particular, have released juvenile fall-run Chinook further away from hatcheries ("offsite" releases) with increasing frequency to avoid mortality from predation, water diversions, and poor water quality (Huber and Carlson 2015). This practice has promoted unacceptably high rates of straying (California HSRG 2012), up to 8 times greater (Kormos et al. 2012 and Palmer-Zwahlen et al. 2013) than the estimated background rate of 5-10% (Cramer 1991) for on-site releases. There is broad concern that off-site releases and resultant high rates of straying have led to introgression of hatchery and natural fall-run Chinook populations, reducing the fitness of both, masking natural fall-run Chinook population declines, and decreasing population productivity, abundance, and life history diversity. Fall-run Chinook salmon appear to be genetically similar in the Central Valley (Williamson and May 2005), which is at least partly due to off-site releases (Garza et al. 2008). Christie et al. (2014) found that early generation hatchery salmonid reproductive success can average around half of natural population reproductive success when spawning in the wild, which may reduce the fitness of an entire population. Widespread straying due to off-site releases probably limits opportunities for local adaptation to tributary conditions (Garza et al. 2008). While the suitability of functional juvenile migration corridors must be addressed, it is clear that the practice of off-site release must end (California HSRG 2012). Stray hatchery fall-run Chinook now make up a large proportion of adults returning to the Tuolumne River, where no hatchery exists, and the proportions of hatchery fish have been increasing in recent years (Stillwater Sciences 2016). While current hatchery management has in some years resulted in short-term increases in adult returns, current policies are a threat to the long-term future viability of all natural fall-run Chinook populations and undermine the effectiveness of measures implemented to improve physical habitat conditions in Central Valley rivers and</p>	Please see response to comment 1166-82 regarding alternatives proposed by commenters. Please also see Master Response 3.1, Fish Protection, regarding hatchery management.

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		<p>the Delta, including those described above for the lower Tuolumne River. Resource Goals: Reduce undesirable impacts of stray hatchery fall-run Chinook salmon on any remaining natural fall-run Chinook salmon in the lower Tuolumne River. Measure: To reduce the undesirable impacts of existing production hatchery practices on fall-run Chinook salmon, the California Department of Fish and Wildlife, National Marine Fisheries Service, and United States Fish and Wildlife Service urgently need to:</p> <ul style="list-style-type: none"> <li>-Implement the recommendations of the California Hatchery Scientific Review Group (California HSRG 2012), including the cessation of off-site releases.</li> <li>-Explore methods for managing non-native predators and their preferred habitats in the Delta and tributaries to reduce hatchery and natural juvenile salmonid mortality.</li> <li>-Implement 100% marking and tagging at all Central Valley hatcheries to allow for accurate accounting of returning hatchery vs. natural adult fall-run Chinook.</li> <li>-Concurrent with 100% marking, explore the possible development of a mark-selective fallrun Chinook salmon fishery to support the re-establishment and protection of all natural Central Valley fall-run Chinook salmon populations. Potential Implementation Issues: California HSRG (2012) identifies several issues that limit the ability of state-operated hatcheries, in particular, to meet hatchery program goals, and provides recommendations to overcome these issues. California HSRG (2012) also provides a number of implementation recommendations and describes areas of needed research.</li> </ul>	
1166	92	<p>[From ATT2:] Anticipated Outcomes A series of computer models relying on site-specific, empirical data collected over the last 20 years have been developed for the lower Tuolumne River. These models enable users to evaluate future conditions under different alternatives. The models were developed in consultation with resource agencies, including the State Water Resource Control Board, during the Federal Energy Regulatory Commission (FERC) relicensing of the Don Pedro Project (FERC No. 2299). Certain components of the SFPUC alternative were analyzed using these models to estimate relative comparisons to a base case representing current conditions on the lower Tuolumne River. The base case is described in the Don Pedro Project Final License Application, Exhibit B, Appendix B. See individual model reports listed below for each model's base parameterization. The base case and model documentation are available online at <a href="http://www.donpedro-relicensing.com">www.donpedro-relicensing.com</a>. Models relevant to the SFPUC alternative include:</p> <ul style="list-style-type: none"> <li>-W&amp;AR-02: Project Operations/Water Balance Model (Steiner 2013);</li> <li>-W&amp;AR-03: Don Pedro Reservoir Temperature Model (HDR 2013);</li> <li>-W&amp;AR-16: Lower Tuolumne River Temperature Model (Stillwater Sciences 2013h); and,</li> <li>-W&amp;AR-06: Tuolumne River Chinook Salmon Population Model (Stillwater Sciences 2013b). SFPUC alternative flow management measures were applied to the Project Operations, Reservoir Temperature, River Temperature, and in-river Chinook Salmon Population models. To simulate the implementation of selected SFPUC alternative habitat and predation management measures on fall-run Chinook salmon, parameter changes (modified from the base case) described below were also applied to the Chinook Salmon Population Model: Gravel Augmentation: Spawning gravel areas were increased in 4 locations to represent the results of Phase I, including 51,627 ft2 at RM 51 (riffle A5/A6), 205,990 ft2 at RM 47 (Basso</li> </ul>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters. Please also see Master Response 3.1, Fish Protection, regarding best available information use in the SED.</p>

**Table 4-1. Responses to Comments**

Ltr#	Cmt#	Comment	Response
		<p>Pool), 206,294 ft<sup>2</sup> RM 44 (Bobcat Flat) and 5,052 ft<sup>2</sup> at RM 41.7 (Turlock Lake State Recreation Area). For these added gravel areas, emergence to survival was increased from 32% to 50%, assuming only a modest increase in newly placed gravel quality. Gravel Cleaning: Cleaned patches at the end of the five-year experimental program were represented by a modest increase from 32% survival to emergence in the base case to 40% for the SFPUC alternative for all non-augmented gravels in the reach from RM 42-52. Predator Removal and Barrier Weir: These measures were modeled as a 15% decrease in predation rate upstream of the proposed RM 25.8 barrier weir, and a 5% decrease below. Results of the modeling exercise suggest that proposed flow management measures, combined with modeled representations of selected habitat and predation management measures may provide a significant relative increase in fall-run Chinook smolt productivity, represented by the number of emigrant smolts per female spawner, relative to the base case (Figure 2 [ATT2:ATT2]). Output of the River Temperature Model indicates improved summer temperature conditions for <i>O. mykiss</i> relative to the base case (Figure 3 [ATT2:ATT3]). Recent work by Verhille et al (2016) found lower Tuolumne River <i>O. mykiss</i> juveniles within 95% of optimum metabolic performance between 18 and 24°C and optimum between 21 and 22°C. Effects of SFPUC alternative measures have not been evaluated at the population level for <i>O. mykiss</i>.</p>	
1166	93	<p>[ATT2:ATT2: Figure 2. Tuolumne River Chinook Salmon Population Model (Stillwater Sciences 2013b) output illustrating average smolt productivity estimates and October-June release volumes under the base case and SFPUC alternative.]</p>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters. The attachment was provided in support of their comments.</p>
1166	94	<p>[ATT2:ATT3: Figure 3. Lower Tuolumne River temperature model (Stillwater Sciences 2013h) output showing 7 day average daily maximum water temperature exceedance values at RM 39.5, June through September, for the base case and SFPUC alternative flow management measures.]</p>	<p>Please see response to comment 1166-82 regarding alternatives proposed by commenters. The attachment was provided in support of their comments.</p>
1166	95	<p>[From ATT2:] Water Supply Effects The SFPUC performed water supply analysis for the Hetch Hetchy Regional Water System (RWS) to evaluate the effects of the proposed SFPUC alternative. The modeling methodology used for this analysis was as described in the memorandum titled "SFPUC Analysis of Proposed Changes to Tuolumne River Flow Criteria" dated March 14, 2017, attached [ATT4:ATT1]. Analysis was performed for three levels of RWS system-wide demand: 265 million gallons per day (MGD), 223 MGD, and 175 MGD. Within each level of demand, two scenarios were evaluated: the current conditions or "base case," and the flow management measures in the SFPUC alternative. No other changes were made to system configuration within each level of demand, which allows the results of simulations for like demands to be compared to evaluate the effects of the SFPUC alternative. Water supply rationing is used as an indicator of negative impact to the SFPUC water supply system. Through application of the SFPUC water supply planning methodology, decreased water supply in system storage in dry years will lead to increased occurrence and magnitude of rationing. Tables 7-1 [ATT2:ATT4], 7-2 [ATT2:ATT5] and 7-3 [ATT2:ATT6] present system-wide rationing in the base case and the SFPUC alternative for system demands of 265 MGD, 223 MGD and 175 MGD, respectively. As shown in Table 7-1, system-wide rationing is required for the base case in 10 out of 91 years in the historical record, and the largest magnitude of rationing required in this sequence is 20%. In the SFPUC alternative, system-wide rationing is required in 15 years out of 91, and the largest magnitude of rationing is 25%. As shown in Table 7-2, rationing is not required in the base case at a system demand of 223 MGD, but 10% rationing is required in 3 years out of 91 in the SFPUC alternative. Rationing is not required for the base case or SFPUC alternative at</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources of water.</p>

**Table 4-1. Responses to Comments**

Ltr#	Cmt#	Comment	Response
		175 MGD.	
1166	96	[ATT2:ATT4: Table 7-1: Comparison of SFPUC RWS Annual Water Supply Delivery Capability for Current Conditions (Base Case) and SFPUC Alternative at an Annual Demand of 265 MGD.]	Please see response 1166-95. The attachment was provided in support of their comments.
1166	97	[ATT2:ATT5: Table 7-2: Comparison of SFPUC RWS Annual Water Supply Delivery Capability for Current Conditions (Base Case) and SFPUC Alternative at an Annual Demand of 223 MGD.]	Please see response 1166-95. The attachment was provided in support of their comments.
1166	98	[ATT2:ATT6: Table 7-3: Comparison of SFPUC RWS Annual Water Supply Delivery Capability for Current Conditions (Base Case) and SFPUC Alternative at an Annual Demand of 175 MGD.]	Please see response 1166-95. The attachment was provided in support of their comments.
1166	99	[ATT2:ATT7: Literature cited in SFPUC's salmon expansion and water supply reliability report.]	Please see response 1166-81. The attachment was provided in support of their comments.
1166	100	[ATT3: Appendix 1. Declaration of Steven R. Ritchie in support of comments by the City and County of San Francisco to the Draft Substitute Environmental Document in support of potential changes to the Bay-Delta Plan.]	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.
1166	101	[From ATT3:] The Raker Act only allows San Francisco to divert water from the Tuolumne River during high flow periods, and requires that San Francisco bypass all flow to the Districts during dry periods. For example, during the recent drought, in FY 2014-2015, San Francisco was only able to divert 22,000 acre-feet ("AF") from the Tuolumne River.	This comment points out two requirements of the Raker Act. The comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.
1166	102	[From ATT3:] The percentage of average reduction in unimpaired flow into the Delta that is attributable to San Francisco's use of water from the Tuolumne River (which, in turn, reduces flow into the San Joaquin River) may be determined by dividing San Francisco's average annual water supply exported from the Tuolumne River, as described in the Final Program Environmental Impact Report for the San Francisco Public Utilities Commission's Water System Improvement Program ("Final WSIP PEIR" or "WSIP"), i.e., 218 million gallons per day ("mgd"), or 244,000 AF/year, (WSIP, at 5.3.1-5), by the total average unimpaired inflow into the Delta, as computed by the California Department of Water Resources, of 29,003,000 AF. [Footnote 1: Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014, March 2016 (DRAFT), Department of Water Resources, Bay-Delta Office, available at <a href="https://msb.water.ca.gov/documents/86728/a702a57f-ae7a-41a3-8bff-722e144059d6">https://msb.water.ca.gov/documents/86728/a702a57f-ae7a-41a3-8bff-722e144059d6</a> , at 5-4.] Thus, San Francisco's exports from the Tuolumne River account for approximately 0.8 percent of total unimpaired Delta inflow per year. (244,000 AF/29,003,000 AF=0.8 percent unimpaired flow.) In fact, in recent years, San Francisco has exported less water from the Tuolumne River than the WSIP average, i.e., San Francisco delivered 205 mgd from the Tuolumne River to the Bay Area, or 230,000 AF/year, in fiscal year ("FY") 2012-2013, and delivered 150 mgd from the Tuolumne River, or 168,000 AF, in FY 2015-2016. See Table J-1, Base Usage (mgd) and Allocation Rates, included hereto as Attachment 1 [ATT3:ATT1].	This comment provides the commenter's determination of the percentage of average reduction in unimpaired flow into the Delta attributable to San Francisco's use of Tuolumne River water and provides the value. The comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.
1166	103	[From ATT3:] Although during the 1987-1992 drought San Francisco purchased approximately 107,848 AF of water, San Francisco only procured a small fraction of that	Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply



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Ltr#	Cmt#	Comment	Response
		<p>amount from either the Modesto Irrigation District ("MID") or the Turlock Irrigation District ("TID," collectively referred to as the "Districts"). The only water transfer completed during the 1987-1992 drought with either of the Districts was a 1990 water transfer from MID to San Francisco for 5,288 AF ("1990 Transfer Agreement"). Although pursuant to the 1990 Transfer Agreement, MID was required to "utilize its best efforts to make available to [San Francisco] up to 20,000 acre-feet of pumped drainage water," (1990 Transfer Agreement, at ¶ 2), MID only made 5,288 AF available to San Francisco for purchase, and of that amount, only 4,891 AF was actually delivered). During the 1987-1992 drought, San Francisco obtained a commitment from the California Department of Water Resources' ("DWR") Drought Emergency Bank for 69,000 AF and from Placer County Water Agency ("PCWA") for 33,560 AF. Of these amounts, only 52,000 AF was actually delivered by DWR, and only 21,042 AF was actually delivered by PCWA. See Water Transfer During 1987-1992 Drought Period, included hereto as Attachment 2 [ATT3:ATT2, ATT3:ATT3].</p>	<p>reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>
1166	104	<p>[From ATT3:] Based on the hydrological record from 1987 through 1992, the Districts would be required, between February and June, to bypass a total of 707,841 AF during the 6-year period under the existing FERC Flow Schedule. Assuming continuation of the 1995 Side Agreement, approximately 365,954 AF of this amount would be bypassed by the Districts on San Francisco's behalf. For example, under a 40 percent unimpaired flow objective, and assuming 1987-1992 hydrology, the Districts would be required to bypass, between February and June, 107,504 AF/year for 6 years, or 645,024 AF, in addition to the FERC flow schedule. Thus, based on the historical 1987-1992 hydrology, and assuming implementation of a 40 percent unimpaired flow objective, between February and June, during the 6-year drought sequence the Districts would be required to bypass approximately 707,841 AF under the existing FERC Flow Schedule and an additional 1,424,328 AF (645,024 AF + 779,304 AF) for a total volume of 2,132,169 AF.</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>
1166	105	<p>[ATT3:ATT1: Table J-1. Base Usage (mgd) and Allocation Rates for San Francisco County.]</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>
1166	106	<p>[ATT3: ATT2: Table comparing water purchases by San Francisco and subsequent deliveries from DWR, PCWA, and MID.]</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>
1166	107	<p>[ATT3:ATT3: Table of San Francisco water purchases, March 1994.]</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>
1166	108	<p>[ATT4: Appendix 2. Declaration of Matt Moses in support of comments by the City and County of San Francisco to the Draft Substitute Environmental Document in support of potential changes to the Bay-Delta Plan.]</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>
1166	109	<p>[ATT4:ATT1: "SFPUC Analysis of Proposed Changes to Tuolumne River Flow Criteria," prepared by Matt Moses, Water Resources Engineer. March 14, 2017.]</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>
1166	110	<p>[From ATT4:ATT1:] SFPUC Contribution to Unimpaired Flow Requirement The contributions that SFPUC would make to the proposed flow standards were calculated for four levels of required flow: 20%, 30%, 40% and 50% of unimpaired flow on the Tuolumne River at La Grange from February through June of each year. Flow shifting and other possible adaptive management adjustments of the unimpaired flow standard are discussed in the SED document, but are not described in sufficient detail to include in model analysis. Therefore flow shifting was not included in the SFPUC analysis. In the SFPUC analysis, the La Grange</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>

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		<p>stream gage was treated as the point of compliance, and accretions and depletions to the Tuolumne River downstream of La Grange were not included in the calculation of required flow. The calculation of SFPUC contribution to the unimpaired flow requirement included the following considerations:</p> <ul style="list-style-type: none"> <li>-The minimum in-stream flow schedule in the existing FERC license at New Don Pedro Reservoir was assumed to be in place. The releases to meet this schedule were assumed to be made by the irrigation districts that operate New Don Pedro Reservoir (Districts) consistent with the existing side agreement between San Francisco and the Districts under the current FERC license.</li> <li>-The responsibility to meet flows required by the SED alternatives from February through June in excess of the existing FERC schedule was assumed to be shared between SFPUC and the irrigation districts. The SFPUC share is assumed to be 51.7% of the required flow that is in excess of the FERC schedule. See Figure 1 [ATT4:ATT1:ATT10] for additional discussion of the assumed contributions to the proposed unimpaired flow standards.</li> </ul>	
1166	111	<p>[From ATT4:ATT1:] System Configuration for SFPUC Model Analysis The SFPUC water supply system was simulated for these analyses as including the facilities described in the 2018 WSIP variant, with two differences noted below. This includes the completion of the suite of WSIP projects. A summary of these facilities is presented in Table 1 [ATT4:ATT1:ATT1], and a more detailed description is provided in the Final Program Environmental Impact Report for the San Francisco Public Utilities Commission’s Water System Improvement Program (Final WSIP PEIR), in Appendix O3, 2018 WSIP Variant. Two differences from the Final WSIP PEIR, Appendix O3 facility assumptions were incorporated into this analysis:</p> <ul style="list-style-type: none"> <li>-In-stream flow releases from Crystal Springs Reservoir to San Mateo Creek were included in this simulation. The average volume of these releases is approximately 3,900 AF per year.</li> <li>-Annual water supply transfers from the Districts to SFPUC were not included in this analysis. An annual transfer of 2,300 AF was assumed from the Districts to the SFPUC Water Bank Account in the WSIP 2018 simulation. The same configuration was used for the RWS in each of the SED alternative analyses described here. Three levels of RWS system-wide demand were evaluated (265 MGD, 223 MGD, and 175 MGD). For each level of system-wide demand, four levels of contribution to a Tuolumne River unimpaired flow standard were evaluated (20%, 30%, 40% and 50%). A scenario with no additional contribution from the RWS to the Tuolumne River (referred to as the base case) was also evaluated for each of the 3 demand levels considered. Because there are no variations in the system facilities, the results of the simulations at different unimpaired flow standards can be directly compared within each level of system demand, and differences between them may be ascribed to the SED alternatives. Water Supply Planning Methodology and the Design Drought SFPUC uses a water supply planning methodology that allows the performance of the RWS to be evaluated for a range of conditions, including varying facility configurations, changes in service area demand and changes in in-stream flow requirements. This methodology involves the simulation of a hydrologic sequence referred to as the design drought, which consists of the hydrology from years 1986 through 1992, followed by the hydrology from years 1976 and 1977. This sequence represents a wet year in which system storage is filled, followed by an 8-year sequence of dry conditions. In applying the SFPUC water supply planning methodology, an initial model simulation of the system is performed for the design drought sequence, using the system configuration to be evaluated. Then the ability of the</li> </ul>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED’s analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>

Table 4-1. Responses to Comments

Ltr#	Cmt#	Comment	Response
		<p>system to deliver water to the service area through the entire design drought sequence is reviewed. If water supply runs out before the end of the design drought sequence in the initial model run, then system-wide water supply rationing is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of rationing, is maintained through the design drought sequence. Rationing is initiated in the model simulations by comparing the total system storage to threshold values. When total system storage is below a given threshold at the end of the annual snowmelt season (treated as the end of the June timestep), a system-wide water supply rationing level that corresponds to that storage threshold will be initiated for the following year. More than one threshold and corresponding level of rationing can be used, so that increasing levels of rationing can be simulated during an extended dry period. These storage thresholds and rationing levels are developed uniquely for each specific combination of water supply system facilities, water demand, and in-stream flow responsibility. In configurations with greater net demands for water supply relative to available supplies and total system storage, rationing will be relatively greater and may be initiated at a higher value of total system storage than in configurations with relatively lesser water demands. These unique combinations of rationing and storage levels are established to maintain delivery through the design drought planning sequence for each system configuration evaluated. Once rationing levels and corresponding storage threshold values are established for a particular system configuration using this methodology, they can be used to simulate the operation of that system through the historical record of hydrology. While the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record. The responses of the system to other dry sequences that have occurred historically indicate how the given system configuration would be operated by SFPUC in similar sequences in the future. Through use of this planning method, SFPUC is able to simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated. For the current analysis of SED alternatives, this water supply planning methodology, including establishment of rationing levels and storage triggers using the design drought sequence, was performed for each combination of system demand and SED flow alternative evaluated. The resulting rationing levels and triggers were then used to simulate operations in the 91-year hydrologic record from 1921-2011.</p>	
1166	112	<p>[From ATT4:ATT1:] Results of SFPUC Model Analysis The SFPUC water supply planning methodology was applied to 15 water system configurations that were developed to evaluate the effects of the SED proposal. These configurations include the four levels of Tuolumne River flow contribution [20%, 30%, 40%, 50%], plus the base case in which no additional flow is released to the Tuolumne River, for a total of 5 SED scenarios. These SED scenarios were evaluated at the 3 levels of SFPUC RWS system demand [265 mgd, 223 mgd, 175 mgd]. Levels of rationing and associated system storage thresholds were determined so that each of these 15 scenarios would maintain water supply delivery through the design drought sequence. Then these scenarios were each simulated using the historical hydrologic record from 1920 through 2011. Water Supply Impacts: Water supply rationing is used as an indicator of negative impact to the SFPUC water supply system. The SFPUC water supply planning methodology was used to set rationing levels for the SED alternatives. A summary</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply and associated economic considerations and other impacts within the SFPUC RWS service area with implementation of the plan amendments. The master response identifies the main points of disagreement or differing assumptions between the SED and the comments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources of water.</p>

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		<p>of system-wide water supply rationing is presented for all 15 simulations in Tables 2 [ATT4:ATT1:ATT2], 3 [ATT4:ATT1:ATT3] and 4 [ATT4:ATT1:ATT4]. Table 2 presents the SED scenarios evaluated at a RWS demand of 265 MGD. Table 3 presents the SED scenarios evaluated at a RWS demand of 223 MGD. Table 4 presents the SED scenarios evaluated at a RWS demand of 175 MGD. For each level of demand evaluated, the only differences between the simulations are the release requirements at La Grange and the adjusted drought rationing levels that are developed through the water supply planning methodology. The effects of the SED alternatives can be evaluated by comparison of simulation results to the base case. The results presented in Tables 2 through 4 each demonstrate a pattern of increased water supply rationing corresponding to increased level of SFPUC contribution to the unimpaired flow requirement. Since the total system demands are altered through simulated contribution to the unimpaired flow requirement, the timing and degree of water supply rationing imposed through the water supply planning methodology are also altered. Table 2 [ATT4:ATT1:ATT2] presents the 5 SED scenarios evaluated at a SFPUC system-wide demand of 265 MGD. In the base case (no contribution to an unimpaired flow standard), water supply rationing is required in 10 out of 91 years evaluated, and the highest level of system-wide water supply rationing required is 20%. When SFPUC contribution to a 20% unimpaired flow standard is evaluated, water supply rationing is required in 16 out of 91 years, and the highest level of system-wide rationing required is 40%. This pattern continues as the unimpaired flow requirement is increased. The alternative identified for implementation in the SED is based on a 40% unimpaired flow requirement, which would require the SFPUC system to impose rationing in 24 years out of the 91-year record, and which would include system-wide rationing levels of up to 54% at a demand level of 265 MGD. Table 3 [ATT4:ATT1:ATT3] presents the 5 SED scenarios evaluated at a SFPUC system-wide demand of 223 MGD. In the base case, water supply rationing is not required, because this level of demand is able to be delivered through the SFPUC water supply planning methodology for the system configuration being evaluated (which includes the completed facilities included in the WSIP 2018 variant). A pattern of increased occurrence and magnitude of water supply rationing similar to that described in Table 2 is demonstrated for the SED alternatives shown in Table 3. When SFPUC contribution to a 40% unimpaired flow standard is evaluated, water supply rationing is required in 19 out of 91 years, and the highest level of system-wide rationing required is 49%. Table 4 [ATT4:ATT1:ATT4] presents the 5 SED scenarios evaluated at a SFPUC system-wide demand of 175 MGD. It should be noted, as described above, that this level of system demand represents present conditions during the drought in 2015 and 2016, and therefore already reflects the implementation of drought rationing. No additional rationing is required in the base case run at the 175 MGD demand level, or in the scenario that includes a 20% unimpaired flow requirement. When SFPUC contribution to a 40% unimpaired flow standard is evaluated for this system demand, additional water supply rationing is required in 16 out of 91 years, and the highest level of system-wide rationing required is 32%.</p>	
1166	113	<p>[From ATT4:ATT1:] Hydropower Generation Impacts: Optimized power generation at SFPUC facilities involves operational changes at the daily timescale or in smaller time increments, because changes in power demand and power cost occur at those timescales. The monthly time-step model that was used for this analysis was developed at an appropriate time-step to evaluate water supply conditions in the Hetch Hetchy system, but it only provides bulk estimates of the power generation that occurs through use of the system. Therefore, a detailed analysis of all expected changes in SFPUC power generation is not available from these model results. However, one pattern does stand out in the monthly timestep results for power generation: When water supply rationing is implemented in response to reduced</p>	<p>Regarding hydropower in sub-monthly time increments, please see Master Response 3.2, Surface Water Analyses and Modeling, regarding daily hydropower ramping and peaking operations. In addition, please see Master Response 8.4, Non-Agricultural Economic Considerations, regarding effects on hydropower generation and revenues. For hydropower issues specific to SFPUC, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System.</p>

**Table 4-1. Responses to Comments**

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		<p>system storage in the SED alternatives, SFPUC hydropower generation is reduced at the generation facilities that are situated in-line with the water supply delivery pipeline, specifically Kirkwood Powerhouse and Moccasin Powerhouse. These hydropower generation facilities are operated when water supply deliveries are made from Hetch Hetchy Reservoir to the Bay Area. When water supply rationing is implemented in response to decreased levels of water in storage, it causes less water to be transmitted through these generating facilities, with the result that less power is generated. The water supply planning model used for this analysis is appropriate for evaluation of this pattern; the pattern of reduced power generation during water supply rationing is driven by annual or multi-year shortages in water supply, which are captured by the model. Table 5 [ATT4:ATT1:ATT5] presents the annual average estimates of power generation for SED alternatives at the 265 MGD level of SFPUC system demand. Periods in which rationing was implemented for multiple years were identified, and the annual average generation is presented for each of these periods. Refer to Table 2 for the water supply rationing levels implemented in these simulations. The relative change in generation from the base case is also shown in Table 5 as a percentage. Average decreases in generation at Kirkwood and Moccasin Powerhouses in time periods when rationing was implemented is less than 10% in the SED alternatives that include 20% and 30% unimpaired flow requirements. Generation at Kirkwood and Moccasin Powerhouses decreases by more than 10% in the scenarios that include 40% and 50% unimpaired flow requirements. Tables 6 [ATT4:ATT1:ATT6] and 7 [ATT4:ATT1:ATT7] are presented in the same format as Table 5. They show changes in Kirkwood and Moccasin Powerhouse generation for the SED alternatives at 223 MGD SFPUC system demand and 175 MGD system demand, respectively. As shown in Table 6, the 20% and 30% unimpaired flow alternatives do not cause a 10% reduction in generation at Kirkwood and Moccasin Powerhouses. The 40% and 50% unimpaired flow alternatives presented in Table 6 exhibit reduced generation at these facilities on the order of 10%. The power generation results presented in Table 7 do not generally include changes on the order of 10% or greater. An order-of-magnitude estimate of the monetary cost of these changes in generation can be provided by multiplying the differences in generation by a value representing the price received for power. The average Day Ahead price for power from March 2016 through February 2017 was calculated for this purpose, and rounded to \$30 per megawatt-hour. Based on the changes in generation presented in Tables 5 and 6, the monetary cost of decreased generation for the 40% or 50% unimpaired alternatives would be approximately \$2 million per year. This cost would be expected to be incurred in years when water supply rationing is implemented in the 40% unimpaired flow alternative.</p>	
1166	114	<p>[From ATT4:ATT1:] Flow Shifting The SWRCB proposal calls for minimum streamflow of 30% to 50% of unimpaired flow from February through June of each year, with actual required levels of flow within this range to be determined by a committee, based on criteria to be determined in a program of implementation. From the description in the document, actual implementation of the proposal could include flow shifting from the February-June period to later periods. A time-series of flow shifts is calculated in the SWRCB Water Supply Effects (WSE) model provided with the SED, but it is unclear whether the rules used to develop those flow shifts reflect how similar decisions would be made upon implementation; because these decisions are deferred until later, the actual flow schedule that would be required in future years is not clearly described in the SED document. Therefore, the SFPUC analysis did not include any flow shifting or other deviations from the nominal unimpaired flow fraction from February to June of each year. To evaluate the SED alternatives, the SFPUC calculated the contribution to streamflow that would be made at 20%, 30%, 40% and 50% unimpaired flow standards and incorporated these contributions into the modeling</p>	<p>Please refer to Master Response 2.1, Amendments to the Water Quality Control Plan, Master Response 2.2, Adaptive Implementation, and Master Response 3.2, Surface Water Analyses and Modeling, for information regarding the flow objectives, the program of implementation, adaptive implementation, and description of modeling of LSJR alternatives. Water management each year will be different, depending on reservoir conditions, precipitation and runoff, ambient temperatures, presence of fish, and other factors. The time-series of flow shifts presented in the Water Supply Effects (WSE) that is provided in the SED are representative of the types of flow shifting that would occur with the implemented LSJR flow objectives. As more fully described in Master Response 2.2, Adaptive Implementation, flow shifting is part of the project.</p>

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		analysis of SFPUC system performance.	
1166	115	<p>[From ATT4:ATT1:] Location of Measurement and Compliance The flow standard proposed by SWRCB for the Tuolumne River would be implemented at the USGS stream gage at Modesto, according to Table 3 of Appendix K of the SED document. However, the amount of flow that would be required by the standard is calculated in the WSE model using the record of unimpaired flow developed for the Tuolumne River at New Don Pedro Reservoir (DWR, 2007), which is located about 35 river miles upstream of the Modesto gage. In the pre-defined alternatives included in the WSE model, it is assumed that natural accretions and other return flows to the Tuolumne River that occur between New Don Pedro Reservoir and the Modesto gage contribute to the compliance with the flow standard, and therefore reduce the amount of required water release at New Don Pedro Reservoir. The compliance standard calculated in the WSE is therefore the unimpaired flow at New Don Pedro Reservoir, to be met at the Modesto gage. But the description of the compliance standard provided in Table 3 of Appendix K is unimpaired flow on the Tuolumne River, with compliance met at the Modesto gage. Unimpaired flow at Modesto is higher than unimpaired flow at La Grange by the amount of natural accretions that occur between the two locations. It is not clearly stated in the SED that compliance would be measured as calculated in the WSE model. In fact, the simple statement of the proposed standard in Appendix K implies otherwise. It is also not clear that the estimated level of accretions and return flows would occur under the changed water use regime proposed in the SED alternatives. For example, reduced agricultural irrigation due to implementation of the SED proposal could cause a reduction in irrigation return flows, which would require more release from New Don Pedro Reservoir to meet the standard, relative to the WSE model assumptions. Increased groundwater pumping could have a similar effect on return flows. As described above, the SFPUC modeling analysis assumed that the La Grange stream gage would be the point of compliance, and that accretions below La Grange would not affect compliance. If an unimpaired flow standard were established at the Modesto gage without modification to account for return flows, then the analysis presented here will have underestimated the resulting impacts to SFPUC water supply. It is worth noting that the analysis presented in the SED would then have also underestimated these impacts.</p>	<p>Please see Master Response 3.2, Surface Water Analyses and Modeling, for information regarding unimpaired flow measurements and compliance locations, accretions and depletions, and a discussion of the purpose of modeling and the appropriate use of modeling and model results in the SED. Please see Master Response 2.1, Amendments to the Water Quality Control Plan, for information regarding the plan amendments and the Program of Implementation, including calculations of unimpaired flow and compliance locations.</p>
1166	116	<p>[From ATT4:ATT1:] Vernalis Flow Standard An additional in-stream flow requirement of 1,000 cubic feet per second at Vernalis is included in the SED, and is assigned to the water users on the San Joaquin River tributaries. It is likely that this standard would be met most of the time if the proposed alternative (30% to 50% unimpaired flow on the tributaries) were implemented. The few periods in which additional releases from storage could be required to meet the proposed Vernalis standard would be low-flow periods in which the quantity of valley floor accretion to the San Joaquin River becomes important. The degree to which accretions to the San Joaquin River from natural inflow and agricultural return flows would be modified in low-flow periods if the proposed SED alternative were implemented is unknown. Changes in irrigation practice and groundwater pumping could cause important changes to these accretions to the San Joaquin River during low-flow periods. SFPUC could not realistically evaluate the need for additional releases from storage to meet the Vernalis requirement in dry years. It is possible that the SFPUC analysis of water supply impacts is underestimated because contribution to the Vernalis flow standard is not included.</p>	<p>Please see Master Response 3.2, Surface Water Analyses and Modeling, for information regarding accretions and depletions.</p>
1166	117	<p>[From ATT4:ATT1:] Impact Analysis In the analysis of SFPUC water supply presented in Appendix L of the SED, RWS operation including the proposed flow standards is approximated by subtracting the calculated amount of contribution to the unimpaired flow</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and</p>

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		<p>standard from the historical value of the SFPUC water bank account balance in New Don Pedro Reservoir. Impacts to the system are then estimated using two different approaches: One method assumes that SFPUC only has a responsibility to contribute to the stream flow requirement when an estimated value of the water bank account balance is positive. The other assumes that SFPUC would contribute at all times. In both cases, the calculation is used to estimate the amount of water that SFPUC would need to purchase or otherwise develop. Both methods included in the SED quantify this amount of water to purchase as the estimated volume below zero to which the water bank account has fallen in these analyses. One of the effects of these methods of quantification is that contributions to meet the proposed flow standards that do not cause the re-calculated water bank account balance to become negative are not counted as impacts, even if those contributions represent a significant volume reduction in the re-calculated storage of the RWS. This happens in 1987 in the analysis presented in the SED, which is particularly significant because this is the first dry year in a long sequence of dry years in the historic record. Similar impacts to SFPUC water storage occur in other dry years (1994, 2002) in the analysis presented in the SED, but these impacts are not quantified in the analysis presented in Appendix L, apparently because the re-calculated water bank account balance is greater than zero. Use of a different metric that includes the contribution of water supply from SFPUC storage in all years would improve the analysis presented in the SED. For reference, Tables 8 [ATT4:ATT1:ATT8] and 9 [ATT4:ATT1:ATT9] are provided, which show the average annual volume of contribution from SFPUC system storage that is required under the SED alternatives. By contrast, the SFPUC model analysis simulates the actual operation of the RWS, which includes making releases from upstream reservoirs to keep the water bank account balance positive, and also includes the implementation of rationing when total system storage becomes depleted. In these simulations, the effect on RWS storage of making contributions to the proposed flow standards is dispersed through the system, instead of being captured entirely in the water bank account. The need for water supply rationing on the RWS is based on the total value of system storage. The estimated system-wide rationing, driven by changes in storage, are used to quantify the effects of the proposed flow standards. As shown in Tables 2 [ATT4:ATT1:ATT2], 3 [ATT4:ATT1:ATT3] and 4 [ATT4:ATT1:ATT4], water supply rationing is applied in the same dry years noted above (1987, 1994, 2002) as a result of SFPUC contribution to the SED proposed alternative.</p>	<p>the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>
1166	118	[ATT4:ATT1:ATT1: Table 1. SFPUC notes on System Configurations for Model Simulations.]	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.
1166	119	[ATT4:ATT1:ATT2: Table 2. Comparison of SFPUC RWS Annual Water Supply Delivery Capability for the SED Alternatives at an Annual Demand of 265 MGD.]	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.
1166	120	[ATT4:ATT1:ATT3: Table 3. Comparison of SFPUC RWS Annual Water Supply Delivery Capability for the SED Alternatives at an Annual Demand of 223 MGD.]	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.
1166	121	[ATT4:ATT1:ATT4: Table 4. Comparison of SFPUC RWS Annual Water Supply Delivery Capability for the SED Alternatives at an Annual Demand of 175 MGD.]	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.
1166	122	[ATT4:ATT1:ATT5: Table 5. Comparison of SFPUC Hydropower Generation for the SED Alternatives at an Annual RWS Demand of 265 MGD.]	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.
1166	123	[ATT4:ATT1:ATT6: Table 6. Comparison of SFPUC Hydropower Generation for the SED	The commenter is providing this attachment for reference purposes in support of their comments. Those

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		Alternatives at an Annual RWS Demand of 223 MGD.]	comments are addressed in these responses to comments; therefore, no additional response is required.
1166	124	[ATT4:ATT1:ATT7: Table 7. Comparison of SFPUC Hydropower Generation for the SED Alternatives at an Annual RWS Demand of 175 MGD.]	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.
1166	125	[ATT4:ATT1:ATT8: Table 8. Average Annual Contribution from SFPUC System Storage, as Calculated from Record.]	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.
1166	126	[ATT4:ATT1:ATT9: Table 9. Average Annual Contribution from SFPUC System Storage, as Simulated in System Model.]	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.
1166	127	[ATT4:ATT1:ATT10: Figure 1. Example Calculation of SFPUC Contribution to Unimpaired Flow Standards Proposed in SED.]	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.
1166	128	[ATT5: Appendix 3. "Bay Area Socioeconomic Impacts Resulting from Instream Flow Requirements for the Tuolumne River." Report prepared for San Francisco Public Utilities Commission by David Sunding, Ph.D., The Brattle Group. March 15, 2017.]	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.
1166	129	<p>[From ATT5:] The water shortages evaluated in this report result from instream flow requirements proposed to be imposed for the Tuolumne River by the State Water Resources Control Board. These shortages are likely to be coincident with dry-year conditions in which non-RWS water supplies otherwise available to the CCSF and the Wholesale Customers are reduced. [Footnote 2: Non-RWS supplies reference supplies available to service demand that are not provided by the RWS system.] Specifically, we examine shortages for the 30%, 40% and 50% unimpaired flow scenarios, as well as under baseline conditions. Socioeconomic impacts are assessed from the perspective of the households and businesses that consume water provided by the RWS. The socioeconomic impact analysis focuses on several standard measures of impact under both current and projected future demands: economic welfare, business sales, and employment. [Footnote 3: Business sales are measured as revenues generated in the following sectors: manufacturing, wholesale trade, information, real estate and rental and leasing, professional, scientific, and technical services, educational services, health care and social assistance, arts, entertainment, and recreation, accommodation and food services, and other services (except public administration).]The method used to estimate these impacts is described in the report Socioeconomic Impacts of Water Shortages within the Hetch Hetchy Regional Water System Service Area, prepared by The Brattle Group in 2014. The version of the impact model used in this report has been updated to incorporate the Plan Bay Area projections of population and employment, and the most recent estimates of household income from the U.S. Census Bureau. These figures are used in the forecast of 2040 water demands for San Francisco and the Wholesale Customers. Shortage Calculations: The estimation of socioeconomic impacts resulting from water shortages occurs via a multi-step process. Water shortages (defined as total demand minus available supply) are estimated relative to two different levels of baseline demand. First, the impacts of instream flow criteria are evaluated under a demand of 223 mgd on the RWS, which corresponds to the pre-drought, normalized level of demand on the RWS. [Footnote 4: Pre-drought, normalized demand represents current demand under normal economic and weather conditions.] Second, impacts are evaluated under RWS demand of 265 mgd, which is equal to the SFPUC's maximum supply commitment to the RWS customers. This level of demand is also consistent with forecasts of RWS demand developed by The Brattle Group projected to occur in 2040. For both the pre-drought and 2040 analyses, RWS demands are calculated taking into account the current and anticipated</p>	<p>This comment is summarizing the 2017 David Sunding report, "Bay Area Socioeconomic Impacts Resulting from Instream Flow Requirements for the Tuolumne River." Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.</p>



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		<p>alternative water supplies, including active conservation, available to SFPUC and the Wholesale Customers for both normal and dry years. That is, RWS demand is calculated as a residual, or total demand minus available alternative supplies. Table 1 [ATT5:ATT1] displays the amount of dry-year alternative supplies for CCSF and the Wholesale Customers, for both the 223 and 265 mgd demand scenarios. These figures were provided by SFPUC and BAWSCA. The figures in Table 1 indicate that alternative supplies are projected to increase significantly in the RWS service area over the next two decades. Despite this increase, it will be demonstrated in subsequent sections of this report that future losses resulting from reduced RWS deliveries are somewhat larger than at present. To calculate shortages for each agency, water supplies available from the RWS in each unimpaired flow scenario and hydrological trace [Footnote 5: A hydrologic trace is a sequence of RWS water supplies available over the historic hydrology, assuming a given level of demand.] are first allocated between the CCSF and the Wholesale Customers in aggregate, based on the Water Shortage Allocation Plan adopted as part of the 25- year 2009 Water Supply Agreement (WSA). The supplies available to the Wholesale customers collectively are then allocated among the individual Wholesale Customers in proportion to an Allocation Basis. [Footnote 6: The Allocation Basis for each Wholesale Customer is calculated based on two components: the fixed Wholesale Customers’ Individual Supply Guarantee, as stated in the WSA, and the variable Base/Seasonal Component, calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies.] For the purposes of estimating the socioeconomic impacts of water shortages, available supplies for each agency are then allocated across the following sectors: single-family residential (SFR), multi-family residential (MFR), commercial and industrial (CI), dedicated irrigation (DI), and other. This method yields estimates of water shortage specific to each sector and Wholesale Customer, for each unimpaired flow scenario and each year in the hydrological trace. Economic relationships that translate these shortages into estimates of social welfare, output, and employment losses are then applied. These economic impact relationships, which are conceptually similar to dose-response functions used in medical research, are developed through econometric analyses of past water use behavior. Table 2 [ATT5:ATT2] displays the maximum shortages for each sector evaluated across the historic hydrology and assuming a 223 mgd level of RWS demand. Maximum shortages occur in 1992 conditions, reflecting the severe water supply restrictions occurring at the end of the six-year drought lasting from 1987 to 1992. Table 3 [ATT5:ATT3] displays the same information for the 265 mgd level of demand. The percent shortages are fairly equivalent to those in Table 2, reflecting the fact that both total demand and non-RWS supplies are projected to grow over the coming two decades.</p>	
1166	130	[ATT5:ATT1: Table 1. Dry Year Alternative Supplies and Active Conservation (mgd) for CCSF and Wholesale Customers.]	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.
1166	131	[ATT5:ATT2: Table 2. Maximum Shortages under RWS Demand of 223 MGD (mgd/percent) for CCSF and Wholesale Customers.]	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.
1166	132	[ATT5:ATT3: Table 3. Maximum Shortages under RWS Demand of 265 MGD (mgd/percent) for CCSF and Wholesale Customers.]	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.
1166	133	[From ATT5:] Water Availability and Growth Projections The Plan Bay Area contains projections of employment and population to 2040. Tables 4 [ATT5:ATT4] and 5 [ATT5:ATT5] display these projections by county. In general, Plan Bay Area anticipates significant growth of employment over this period, particularly in Alameda, San Francisco and Santa Clara	Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED’s analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take in response to potentially

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		<p>counties. Plan Bay Area anticipates a similar pattern of population growth, with more population growth projected to occur in San Francisco and Santa Clara counties than is the case with job growth. The large maximum shortages displayed in Tables 2 [ATT5:ATT2] and 3 [ATT5:ATT3] call these growth patterns into question. In San Francisco County, for example, it is questionable whether a projection of 42% job growth is realistic given that businesses in the city can expect 50% water shortages in a multi-year drought. Similarly, it is dubious that developers in Santa Clara County would be willing or able to build enough housing units to support up to 73% growth in population, when those same households would be subjected to 56% water restrictions during the driest periods. The apparent mismatch between Bay Area growth projections and expected dry-year shortages raises the question of whether the instream flow restrictions in the SED would alter patterns of growth in the Bay Area.</p> <p>Economic Impacts: Welfare Losses Welfare loss estimates are based on relationships that capture the amount consumers would pay to avoid a shortage of a given magnitude. Economists refer to this value as "willingness to pay" ("WTP"). Consumers' WTP to avoid a water shortage is estimated by observing how consumers have responded to price changes in the past. Water rates increase over time and vary across agencies. By observing how consumption changes as water rates change, we can estimate the "price elasticity of demand." or the responsiveness of demand to price. This price elasticity can then be used to determine how much consumers would be willing to pay to achieve various levels of consumption, and conversely how much they would be willing to pay to avoid reducing their consumption levels. [Footnote 9: For more on the specific method used to determine residential and business WTP and welfare loss, see Buck, S., M. Auffhammer, S. Hamilton and D. Sunding, "Measuring Welfare Losses from Urban Water Supply Disruptions," Journal of the Association of Environmental and Resource Economists (September 2016): 743-778.] Separate price elasticities are used for different sectors and agencies to account for variation in responsiveness to price. Resulting welfare loss estimates for the CCSF and the Wholesale Customers in aggregate, under pre-drought normalized demand, are presented in Table 6 [ATT5:ATT6]. The tables in this report display impacts for the 1987-1992 drought, which is the period of the most significant shortages over the hydrologic record. Over the 1987-92 drought, impacts for San Francisco range from \$313 million to over \$1.3 billion in lost welfare. For the Wholesale Customers, equivalent losses range from \$1.1 billion to \$2.9 billion. Welfare loss estimates under projected RWS demand of 265 mgd are presented in Table 7 [ATT5:ATT7]. Welfare losses are significantly larger in the 265 mgd case. For CCSF, welfare losses from the 30%-50% Unimpaired Flow scenarios range from \$841 million to \$2.9 billion. For San Francisco's Wholesale Customers, losses range from \$3.5 billion to \$7.3 billion over the 1987-92 hydrology. It has been suggested that the low level of RWS water sales occurring in 2015-16 could be used to evaluate impacts assuming a "new normal" level of RWS demand of 175 mgd. This approach would be highly misleading for several reasons. The figure of 175 mgd was the level of actual purchases of RWS water during the drought--it is not a level of demand. Given prevailing rates and economic conditions, customers would have preferred to purchase more water during this period, but were prevented from doing so by the Governor's mandate to reduce water usage as implemented by the State Water Resources Control Board. The actual demand during the drought was the 223 mgd employed in this report. Restricting purchases below this amount results in economic losses of the type presented in this report. To call a restricted level of purchases the new level of demand simply assumes away any economic loss. In 2015-16, the Wholesale Customers reduced residential consumption by around one-quarter in response to the Governor's mandate. In San Francisco, residential consumption changes by roughly half this amount due to the already low level of consumption in the city. In the 30% Unimpaired scenario, residential cutbacks reach 38% in San Francisco and 44% in the Wholesale Customer service</p>	<p>reduced water supplies. Please also see Master Response 8.5 regarding a discussion of welfare losses. See also response to comment 1166-45.</p>

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		area under the 223 mgd level of RWS demand, well beyond the shortages experienced by customers in the service area during the severe recent drought.	
1166	134	[ATT5:ATT4: Table 4. Plan Bay Area Employment Growth by County (from 2010 levels).]	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.
1166	135	[ATT5:ATT5: Table 5. Plan Bay Area Population Growth by County (from 2010 levels).]	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.
1166	136	[ATT5:ATT6: Table 6. Welfare Losses Associated with RWS Demand of 223 MGD (\$ millions).]	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.
1166	137	[ATT5:ATT7: Table 7. Welfare Losses Associated with RWS Demand of 265 MGD (\$ millions).]	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.
1166	138	<p>[From ATT5:] Economic Impacts: Business Output and Employment Losses The other measures of socioeconomic impact evaluated are sales and employment. Business output, defined as the value of sales of all business establishments in a particular area, is a standard way of measuring economic activity. Employment is another summary measure of economic activity and is defined as the number of full-time equivalent jobs in the given area. Dry-year shortages have the potential to influence business sales and employment when businesses are forced to curtail their water consumption. Changes in output under each scenario are based on the shortages incurred by the CI sector in each Wholesale Customer's service territory. Given a CI water shortage, county-specific output multipliers [Footnote 10: MHB Consultants, Inc., "The Economic Impact of Water Delivery Reductions on the San Francisco Water Department's Commercial and Manufacturing Customers," 1994. Tables 13 and 14 (pp. 48, 50).] are used to translate a percent change in water availability to the CI sector into a percent change in business revenue. Separate multipliers are used for relatively moderate shortages (below 15%) and for more severe shortages (over 15%), to account for the fact that an additional cut back in water supply becomes more difficult to manage the further supply has already been reduced. Averaging multipliers across the industries included in the analysis, based on their share of annual payroll in the Wholesale Customers' service territories, each percent shortage under 15% translates into 0.038% lower sales revenue in the commercial sector, and 0.128% lower sales revenue in the industrial sector. Each percent shortage above 15% translates into a sales revenue reduction of 0.402% in the commercial sector and 0.470% in the industrial sector. Resulting output losses under pre-drought normalized demand are shown in Table 8 [ATT5:ATT8]. Table 8 indicates that under pre-drought levels of demand, commercial and industrial shortages result in output losses of between \$19.8 and \$87.5 billion for San Francisco, and from \$30.7 to over \$200 billion in the Wholesale Customers service area. Output losses under projected 2035 demand are shown in Table 9 [ATT5:ATT9]. As expected, losses under 265 mgd demand are larger than assuming pre-drought demands. For CCSF, output losses over the 1987-92 drought total between \$22.1 and \$109.4 billion. For the Wholesale Customer service area, output losses range from \$94.0 to \$305.8 billion over this same period. Using a similar method, agency-specific multipliers [Footnote 11: MHB Consultants, Inc., "The Economic Impact of Water Delivery Reductions on the San Francisco Water Department's Commercial and Manufacturing Customers," 1994. Tables 13 and 14 (pp. 48, 50).] are used to translate shortages in the CI sectors into changes in employment. Job losses under pre-drought normalized demand conditions are presented in Table 10 [ATT5:ATT10]. For CCSF, job losses under 1987-92 hydrology range from 83,943 annual FTE over the six-year drought, to</p>	Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.

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		373,214 under the 50% Unimpaired Flow scenario. For the Wholesale Customers, annual FTE losses are between 112,806 and 513,619 under the same conditions. Job losses under RWS demands of 265 mgd are shown in Table 11 [ATT5:ATT11]. As in the case of output losses, job losses are larger in the 265 mgd demand case than under pre-drought demands. San Francisco job losses range from 88,346 annual FTE to 443,317 annual FTE. Losses are significantly larger for the Wholesale Customers and range from 280,529 to 705,197 lost annual FTE over the six-year drought.	
1166	139	[ATT5:ATT8: Table 8. Output Losses Associated with RWS Demand of 223 MGD (\$ millions) for CCSF and Wholesale Customers.]	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.
1166	140	[ATT5:ATT9: Table 9. Output Losses Associated with RWS Demand of 265 MGD (\$ millions) for CCSF and Wholesale Customers.]	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.
1166	141	[ATT5:ATT10: Table 10. Job Losses Associated with RWS Demand of 223 MGD (full-time equivalent jobs) for CCSF and Wholesale Customers.]	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.
1166	142	[ATT5:ATT11: Table 11. Job Losses Associated with RWS demand of 265 MGD (full-time equivalent jobs) for CCSF and Wholesale Customers.]	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.
1166	143	[From ATT5:] Rate Impacts from Water Shortages SFPUC and the Wholesale Customers recover fixed costs through volumetric rates. That is, rate structures in the Bay Area are such that water rates are well in excess of variable operating costs. As a result, when sales fall through supply restrictions, water rates must increase to balance water utility budgets. For the 265 mgd demand scenario, water rates in CCSF will need to increase by 4% in the 30% Unimpaired case, by 7% in the 40% Unimpaired case, and by 16% in the 50% Unimpaired case. For the Wholesale Customers, rates will need to increase by 6% in the 30% Unimpaired case, by 9% in the 40% Unimpaired case, and by 15% in the 50% Unimpaired case. Even with these significant rate increases, which come on top of some of the highest water rates among California water utilities, cities will be forced to make heavier use of balancing accounts and other financial reserves to cope with the budgetary instability caused by less reliable water supplies. Comparison to SWRCB Economic Analysis The economic analysis contained in Chapters 20 and 16 and Appendix L of the SED is unrealistic and should not be relied upon by the SWRCB as a basis for decision-making. The main analysis in Chapter 20 largely assumes away the real problem faced by San Francisco and its Wholesale Customers by positing that dry-year transfers with MID and TID can replace lost supplies. This approach is overly simplistic, and ignores recent experience with transfers among Tuolumne River users. By artificially minimizing the economic impacts of the contemplated instream flow regulations, the SED places Bay Area water consumers at significant risk of large future water shortages and economic losses. The SED assumes that in dry periods like 1987-92, SFPUC is able to purchase more than 200,000 acre-feet annually at a price of \$1,000 per acre-foot to replace lost RWS supplies. This assumption is unrealistic and contrary to recent experience. SFPUC's Water System Improvement Program (WSIP) evaluated dry-year water transfers from MID and TID of 25 mgd. Subsequent analysis revised this volume down to a mere 2 mgd, and SFPUC and the Districts were unable to agree on the terms of a transfer of even this minimal amount. Indeed, during the last drought, CCSF and the Wholesale Customers endured significant reductions of per capita water use and even then were unable to acquire transfer water from MID and TID. Conclusions Over the next 25 years, forecasted growth in the residential, commercial, and industrial sectors will strain the RWS's ability to meet the water needs of homes and	Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies.

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		<p>businesses in its service territory. Currently, the RWS provides nearly all of the water for the CCSF and approximately 65% of the water demanded by Wholesale Customers. Fourteen of the 26 Wholesale Customers receive 100 percent of their water supply from the RWS. Collectively, the RWS supplies nearly three-quarters of the water demanded by the entire customer base in the RWS service area. Low per capita water use reveals a substantial investment in water conservation measures including installation of water-efficient appliances, and suggests subsequent conservation may be expensive and result in smaller water savings. Per capita residential use in the RWS service area is 44 gallons per capita per day (gpcd) in San Francisco and 77 gpcd across all sectors. Average per capita residential consumption in the Wholesale Customer service area was 64.7 gpcd in FY 2014-15 and gross per capita consumption was 105.7 gpcd. By comparison, at the peak in FY 1986-87, gross per capita consumption in the Wholesale Customer service area was 186.5 gpcd. Further, residential consumption in the RWS service area is well below the statewide average of 76.6 gpcd. Similarly, while many water agencies have invested in non-RWS supplies, subsequent investments may call on expensive technologies with less-certain results. For these reasons, current and projected future non-RWS water supplies are not sufficient to mitigate the adverse impacts of reduction in RWS supplies, especially since these reductions will likely coincide with shortages on non-RWS supplies. In fact, welfare losses due to reductions on RWS supply are larger in part because these reductions would come at a time when the non-RWS supplies are also stressed. Overall, the analysis reveals that even after accounting for growth in non-RWS supplies under dry-year conditions, reductions on RWS supplies have the potential to cause significant socioeconomic impacts in the Bay Area. Welfare losses to customers, lost economic output from area businesses, and reductions in employment are likely to result from interruptions in water supply. The magnitude and duration of these impacts will depend on growth, climate, conservation, and investment in non-RWS supplies, but the impacts from instream flow requirements examined in this report are likely to constitute a major disruption to the Bay Area economy.</p>	
1166	144	<p>[ATT6: Appendix 4. Declaration of Jonathan P. Knapp in support of comments by the City and County of San Francisco to the Draft Substitute Environmental Document in support of potential changes to the Bay-Delta Plan. March 2017.]</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>
1166	145	<p>[ATT6:ATT1: Public Records Act Request to the State Water Resources Control Board from City and County of San Francisco City Attorney Dennis J. Herrera and Deputy City Attorney Jonathan P. Knapp. October 14, 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>
1166	146	<p>[ATT6:ATT2: August 15, 2016 email chain between ICF Senior Environmental Planner Nicole Williams and SWRCB staff members William Anderson and Timothy Anderson, with additional attachments.]</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>
1166	147	<p>[ATT6:ATT2:ATT1: Recreation Plan for Black Creek Arm Day Use Area. Tri-Dam Project. FERC No. 2067 Article 409. December 18, 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>
1166	148	<p>[ATT7: Appendix 5. Memo from Leslie Moulton-Post, Alisa Moore, Karen Lancelle, Chris Mueller of Environmental Science Associates to San Francisco City Attorney's Office. "CEQA Adequacy Review of the Desalination Water Supply Alternative in the Draft Substitute Environmental Document (SED) in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality." March 15, 2017.]</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>

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1166	149	[From ATT7:] Regional Desalination Project The SED indicates that a desalination plant on the order of 50 million gallons per day (mgd) capacity would be needed to fully compensate for the water supply shortfall that would result from the SWRCB's proposed water quality plan revisions under select alternatives (LSJR Alternatives 3 and 4). The SED description of a water supply desalination option for the SFPUC builds on the description and studies completed to date on the Bay Area Regional Desalination Project (BARDP). The 50+ mgd desalination project concept envisioned in the SED is twice the size of the BARDP's 20 mgd plant proposed for the existing Mallard Slough Pump Station site.	Please see response to comment 1166-68.
1166	150	[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be addressed during subsequent phases of project development, environmental evaluation and permitting: Additional coordination between the five BARDP partner agencies would be required during dry years when partner demand exceeded both available BARDP production capacity and storage. Excess BARDP production can be stored in Los Vaqueros Reservoir in non-drought years through an exchange with CCWD, and the stored BARDP water can be released from the reservoir in drought years. Under current EBMUD system limitations on timing and flow rates, not all drought year demands of the partner agencies can be met with the use of water stored in the existing 160,000 acre-foot-capacity Los Vaqueros Reservoir. [Footnote 6: BARDP Site Specific Delta Modeling Report, p 113, Section 3.1.] When the annual partner demand exceeds both the available BARDP production capacity and storage, deliveries to the partners would be less than the demand. The BARDP Site Specific Delta Modeling Report did not make any assumptions about how water would be allocated among partners during shortages. It was expected that the allotment of water during shortages would be negotiated if the BARDP partnership continues forward. Possible options when demand exceeds supply include all partners receiving an equal percent reduction of their stated demand, all partners equally dividing the available supply, or only a subset of partners receiving water during drought years. [Footnote 7: BARDP Site Specific Delta Modeling Report, p. 122, Section 3.5.]	This comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Also, please see response to comment 1166-68.
1166	151	[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be addressed during subsequent phases of project development, environmental evaluation and permitting: During critically dry years BARDP operations would need to be coordinated with the Central Valley Project, State Water Project, and the City of Antioch (upstream water users) to ensure water quality standards in the Bay-Delta are met. [Footnote 8: BARDP Site Specific Delta Modeling Report, p. 27, Section 1.10.]	Please see response to comment 1166-68. This comment does not make a general comment regarding the plan amendments or raise significant environmental issues.
1166	152	[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros	This comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Also, please see response to comment 1166-68.

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		<p>Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be addressed during subsequent phases of project development, environmental evaluation and permitting: Modeling conducted for the CCWD feasibility study optimized delivery of the stored water by delivering bulk releases on a schedule compatible with CCWD system operating rules up to the maximum pipeline inertia capacity, and delivering the stored water based on agencies' annual demand at the earliest available opportunity each year. This modeling assumed that "EBMUD has sufficient flexibility to wheel water to the other partners on this schedule [deliver the stored BARDP water that will be needed in a given year to meet specified demands at the earliest available opportunity each year], or otherwise exchange the BARDP deliveries with local storage for short periods of time, and that the other partners have local storage or other flexibility within their systems to absorb the water when it is delivered." The physical capacity of local storage or other options for the agencies to absorb deliveries on the schedule that was modeled would need to be verified.</p>	
1166	153	<p>[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be addressed during subsequent phases of project development, environmental evaluation and permitting:</p> <p>To confirm that operation of a new desalination plant at Mallard Slough would be able to comply with Bay-Delta water quality regulations, additional modeling would be required as new Delta water projects and regulatory programs are planned, including the new flow criteria for the Delta set by the SWRCB as part of the update to the Water Quality Control Plan for the San Francisco Bay-Sacramento San Joaquin Delta Estuary and the California WaterFix (then called the Bay-Delta Conservation Plan). [Footnote 9: BARDP Site Specific Delta Modeling Report, p. 27, Section 1.10.]</p>	<p>This comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Also, please see response to comment 1166-68.</p>
1166	154	<p>[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be addressed during subsequent phases of project development, environmental evaluation and permitting: Additional modeling would also be required to better characterize near field brine impacts on water quality. [Footnote 10: BARDP Site Specific Delta Modeling Report, p. 20, Section 1.8.]</p>	<p>This comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Also, please see response to comment 1166-68.</p>
1166	155	<p>[From ATT7:] Following the pilot study, the BARDP Site Specific Delta Modeling Report included site-specific analyses for a 20 mgd plant to evaluate (1) potential water quality impacts of the desalination facility and brine disposal; (2) potential impacts on sensitive fish populations; and (3) conjunctive operation of the desalination facility with the Los Vaqueros Reservoir. That study concluded that the desalination project at that location was technically feasible and identified the following unresolved issues that would need to be</p>	<p>This comment does not make a general comment regarding the plan amendments or raise significant environmental issues.</p>

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		<p>addressed during subsequent phases of project development, environmental evaluation and permitting: Future project planning and evaluation studies need to more specifically analyze both general environmental impacts of project construction and operation to aquatic species to identify appropriate project design features and mitigation measures and, specifically need to address impacts to listed species to achieve compliance with state and federal endangered species regulations. Regarding potential fish entrainment, the BARDP Site Specific Delta Modeling Report found that changes to operations and intake design could reduce or avoid impacts to fisheries and that a "preferred combination of minimization and avoidance measures will be evaluated if the project proceeds with an environmental impacts analysis at a later date in the future." [Footnote 11: BARDP Site Specific Delta Modeling Report, p. 70, Section 2.1.]</p>	
1166	156	<p>[From ATT7:] SED Water Supply Desalination Option Chapter 16 describes the SED evaluation of "other indirect actions" associated with the Lower San Joaquin River Alternatives 2, 3 and 4. It identifies actions the regulated community, including the City and County of San Francisco (CCSF), could take to reduce potential reservoir or water supply effects associated with implementing the LSJR alternatives, including "desalination of ocean or brackish water." Chapter 16 considers a desalination treatment plant at the Mallard Slough site identified for the BARDP, operating during all hydrologic years, but having a capacity of approximately 50,000 or 56,000 AFY (SED p. 16-74) (i.e., a plant that would divert approximately 50 mgd of raw water, as compared to the 20 mgd plant diverting 26,100 AFY assumed in the BARDP Site Specific Delta Modeling Report). The SED's description of the Water Supply Desalination option is presented in Section 16.2.6 on pages 16-70 to 16-75 and is based primarily on information presented in several studies prepared as part of the BARDP, in particular, the 2014 BARDP Site Specific Delta Modeling Report, the Final Draft Bay Area Regional Desalination Project Greenhouse Gas Analysis by Kennedy/Jenks, [Footnote 12: Kennedy/Jenks Consultants, Final Draft Bay Area Regional Desalination Project Greenhouse Gas Analysis, Prepared for Bay Area Regional Desalination Project, 11 January 2013.] and the SFPU's Water System Improvement Program Final Program Environmental Impact Report (WSIP PEIR). The SED also briefly summarizes impacts that were identified for the Poseidon Desalination Facility in Carlsbad, California (San Diego County), a 56,000 AFY facility the SED suggests is closer to the size that would be needed to address water supply shortfalls under LSJR alternatives.</p>	<p>The comment presents information contained within Chapter 16, Evaluation of Other Indirect and Additional Actions. This comment does not make a general comment regarding the plan amendments or raise significant environmental issues. Also, please see response to comment 1166-68.</p>
1166	157	<p>[From ATT7:] General Comments on Feasibility of the SED Water Supply Desalination Option The SED assumes that it is feasible to construct and operate a desalination facility approximately twice the size of that evaluated for the BARDP (diverting 50,000 to 56,000 AFY of raw water or about 50 mgd), located at the Mallard Slough site evaluated for the BARDP pilot study and BARDP Site Specific Delta Modeling Report. However, the SED does not substantiate the assumption that this larger, 50 mgd desalination facility is feasible at the Mallard Slough site. Concerns about the feasibility of the desalination plant option envisioned in the SED include the following: Site Size. Would the desalination project envisioned in the SED fit at the assumed Mallard Slough site? A 2007 feasibility study conducted for the BARDP concluded that the CCWD property at Mallard Slough could not accommodate a desalination plant that could treat 65 mgd of raw water, which would require about 18.5 acres. [Footnote 13: URS, Bay Area Regional Desalination Project Feasibility Study, July 2007.] The SED does not provide an estimate of the size of the site needed for the large plant it envisions; however, based on the 2007 study it is assumed that siting a larger facility at Mallard Slough would likely require the purchase of additional land. This in turn would require identifying an appropriate adjacent parcel and willing seller and</p>	<p>Please see response to comment 1166-68.</p>



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		<p>could displace existing habitat or other land uses. The area surrounding Mallard Slough appears largely to consist of wetlands. The SED did not address the feasibility of expanding the CCWD site to accommodate a larger desalination plant. Water rights. It is not apparent that sufficient water rights and licenses would be available or could be obtained to withdraw the amount of water proposed for the SED desalination project. Specifically, in order to operate a desalination plant at Mallard Slough with a production capacity greater than 22,400 AFY, additional water rights would need to be obtained and that process "could take over 10 years." [Footnote 14: Bay Area Regional Desalination Project Institutional Task Technical Memorandum #2: Analysis of Feasible Scenarios, September 19, 2011, p. 9, Section III.C.] Larger intake. A larger intake would be needed for plant larger than the 20 mgd facility proposed in the BARDP studies, as the capacity of the existing intake is 40 mgd. The feasibility of siting and permitting the construction and operation of a larger intake at Mallard Slough is uncertain given constraints identified for the 20 mgd plant and is not addressed in the SED. Brine Discharge. The BARDP studies identify brine blending and discharge constraints for a 20 mgd plant that would be further exacerbated by a larger facility. Blending the amount of brine generated by a larger facility with the dry weather outflows of the two wastewater treatment plants currently proposed to be used by the BARDP (CCCSO or DDSO) would exceed the discharge capacities of either plant, affecting the feasibility of the SED proposal if brine dilution is a necessary condition for water quality purposes. The SED assumes that the approximately 10 mgd of brine generated by a larger desalination facility could be discharged via CCCSO or DDSO [Footnote 15: Regarding the outfalls identified for BARDP brine discharge in the BARDP Site Specific Delta Modeling Report, the SED refers to brine disposal at "CCWD or DDWD" [sic.] outfalls. Table 1-5 of the BARDP Site Specific Delta Modeling Report identifies the projected treatment plant flows for DDSO and CCCSO. [Footnote 16: BARDP Site Specific Delta Modeling Report, p. 18.] As indicated there, under their current NPDES permits, DDSO does not have capacity to accommodate this amount of additional flow now and by 2020 CCCSO would not have capacity to accommodate 10 mgd of additional flow.</p> <p>-2015 dry weather discharge at DDSO was estimated to be 16.4 mgd and its NPDES permitted discharge capacity is 16.5 mgd.</p> <p>-By 2020 CCCSO's dry weather discharge is projected to be 44 mgd, and its NPDES permitted discharge capacity is 53.8 mgd. The BARDP Site Specific Delta Modeling Report indicates that CCCSO would be unable to accommodate the anticipated 5 mgd of brine from the BARDP by 2030. The larger SED plant would accelerate the time by which an alternative disposal strategy would need to be developed and its potential water quality impacts evaluated. The SED fails to address this or the probability of whether a new or larger-capacity outfall would be required or permitted in the Delta. Water storage and distribution. Conjunctive operation of Los Vaqueros Reservoir (whereby excess desalinated product water would be stored in non-drought years and released for use in drought years) would be subject to existing EBMUD system limitations on timing and flow rates. The BARDP Site Specific Delta Modeling Report found that 71 percent of drought-year demands could be met with the use of interannual storage in the reservoir, and that pretreatment of water to be released to EBMUD's system could increase this level to 84 percent. [Footnote 17: BARDP Site Specific Delta Modeling Report, p 5, Executive Summary.] While the BARDP Site Specific Delta Modeling Report concluded that EBMUD infrastructure had adequate capacity to wheel this percentage of needed supplies to partner agencies during a drought, given the existing limitations it is reasonable to expect that EBMUD infrastructure will constrain deliveries of the much higher volumes of water that would need to be delivered to CCSF and</p>	

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		<p>potentially other agencies during drought periods under LSJR Alternatives 3 and 4. In addition to physical capacity limitations, the two existing interties that link other water systems to the SFPUC system--the EBMUD/SFPUC Emergency Intertie in Hayward and the SFPUC/SCVWD Emergency Intertie in Milpitas--were constructed to allow water transfers during emergencies. Use of these interties on a regular basis would require new memoranda of understanding between the affected agencies, and potentially additional environmental review, or other permits and approvals.</p>	
1166	158	<p>[From ATT7:] Adequacy of Environmental Analysis Inconsistent Information and Unclear Application of Other Environmental Studies Section 16.2.6 of the SED describes and tries to make use of several environmental impact analyses prepared for different iterations of a BARDP desalination plant over the past decade as well as the certified EIR prepared for the much larger Carlsbad desalination plant located in a very different geography on the coast in southern California. The SED provides only a vague indication of how these other project analyses might apply to the desalination water supply option the SED anticipates would be needed as an "additional action" to address drought-period supply shortfalls under LSJR alternatives. Citing the BARDP Site Specific Delta Modeling Report, Section 16.2.6 presents information on a desalination project with a "maximum capacity of 28,000 AFY" (SED p. 16-71), and under "Summary of Potential Action" (pp. 16-72 to 16-73) describes a desalination project similar to the BARDP described in the BARDP Site Specific Delta Modeling Report: it would be located at Mallard Slough, store excess water in normal and wet years in Los Vaqueros Reservoir, and meet demands of BARDP partner agencies consistent with information presented in the BARDP modeling report. (This information presented in the SED is generally consistent with but not identical to the project evaluated in the BARDP Site Specific Delta Modeling Report. [Footnote 18: Differences between the BARDP described in the 2014 feasibility study and the SED discussion of the BARDP at Mallard Slough include daily and annual diversion rates: the BARDP Site Specific Delta Modeling Report identifies a diversion rate of 25 mgd (not 21 mgd as stated in the SED) and annual diversions of 26,100 AFY (not 28,000 AFY) based on diversions occurring 11 months per year (BARDP Site Specific Delta Modeling Report, p. 114, Section 3.3).]) The SED discussion of "Potential Environmental Effects" (pp. 16-73 to 16-75) describes the significant impacts the 2008 WSIP PEIR identified for the BARDP evaluated in the PEIR as part of a WSIP variant. As summarized in the SED, the PEIR determined that operation of the BARDP would result in potentially significant and unavoidable impacts on hydrology and water quality, biological resources, and energy resources; and that significant impacts associated with the following resources could likely be reduced to less than significant with the implementation of mitigation measures: land use and visual quality; geology, soils, and seismicity; air quality; cultural resources; GHG emissions; hazards; noise and vibration; traffic, transportation, and circulation; public services and utilities; recreational resources; and agricultural resources. The SED discussion of potential environmental effects then summarizes the results of the 2014 BARDP Site Specific Delta Modeling Report and the 2013 Kennedy/Jenks analysis of greenhouse gas emission (which evaluated the same BARDP project as the BARDP Site Specific Delta Modeling Report), stating that the BARDP modeling report found that changes in ambient water quality associated with BARDP operations and brine disposal were too small to be accurately measured in the field and that during most conditions operations would not have a significant impact on water quality or beneficial uses. To avoid impacts during critically dry water years, the BARDP Site Specific Delta Modeling Report stated that BARDP operations would need to be coordinated with operations of the CVP, SWP, and the City of Antioch. The SED notes that the greenhouse gas analysis quantified GHG emissions from BARDP operations and identified measures and projects to reduce</p>	<p>Please see response to Comment 1166-68. Chapter 18, Summary of Impacts and Comparison of Alternatives, provides a summary of impact determinations in Table 18-6, CEQA Significance Summary of LSJR Alternatives—Other Indirect Actions. Chapter 16, Evaluation of Other Indirect and Additional Actions, has been modified to clarify the basis for making the significance determinations, but the impact determinations have not been changed. The numbers in Section 16.2.6, Water Supply Desalination, have been modified to reflect those identified in the comment in the BARDP Site Specific Delta Modeling Report, p. 114, Section 3.3. This modification does not change impact determinations or conclusions identified in the SED.</p>

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		<p>potential GHG emissions. The discussion presented in Chapter 16 suggests that the site-specific BARDP Site Specific Delta Modeling Report and Kennedy/Jenks analysis for the 26,100 AFY BARDP largely address concerns about significant unavoidable impacts that were identified in the WSIP PEIR for the 20 mgd BARDP. However, the SED does not address how the conclusions of the BARDP analyses it cites could change with a larger water supply desalination project. The SED acknowledges that a larger facility than those evaluated in BARDP studies would be needed. The SED states that a larger facility "(e.g., 56,000 AF/y) would have similar types of construction and operation impacts" but fails to acknowledge or address how the magnitude or significance of such impacts may change with a larger desalination facility and, considering such changes, whether a larger plant would be permissible or otherwise feasible. The SED states that the "[l]ong-term operational impacts of a large desalination facility with a capacity of 56,000 AFY would be similar in nature to those described in the feasibility studies as well as in the WSIP PEIR for the BARDP," and identifies the following as the primary impacts of a desalination facility:</p> <ul style="list-style-type: none"> <li>-Biological resources impacts due to marine life entrainment and brine discharge</li> <li>-Air Quality/GHG/Energy impacts due to energy demand of treatment</li> <li>-Routine transport and disposal of hazardous materials due to use of additional chemicals for treatment</li> <li>-Impacts on open space and recreation areas The SED does not indicate the significance of these impacts. As discussed above, the BARDP feasibility studies and WSIP PEIR reach different conclusions as to the significance of several of these impacts.</li> </ul>	
1166	159	<p>[From ATT7:] Regarding a larger desalination facility, the SED points to a project-level EIR recently completed for a desalination plant on the coast in Carlsbad, California (San Diego County). That analysis determined that the only significant unavoidable impacts were cumulative regional impacts on air quality for the production of ozone and PM10, and that impacts on the following resources would be less than significant after mitigation: cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, and traffic and circulation. The SED acknowledges that "there are many geographic differences between the San Francisco Bay-Delta and Carlsbad," but fails to address the implications of such differences (such as existing environmental stresses on the Delta and the presence in the Delta of endangered species), and appears to dismiss such differences because the analysis of the Carlsbad facility identified "similar environmental impacts" to those identified for the BARDP. The SED discussion of a water supply desalination option to address LSJR alternatives only summarizes conclusions of the other project analyses that have reached differing conclusions about the significance of impacts in key topic areas. The SED indicates that the types of impacts would be similar. The SED discussion in Chapter 16 draws no conclusions as to significance of the impacts the larger 50 mgd desalination plant at Mallard Slough envisioned in the SED would have, and does not connect the discussion of the various analyses to impact summary Table ES-22 presented in the Executive Summary. The summary of impacts presented in the SED Executive Summary, Table ES-22, CEQA Significance Summary of LSJR Alternatives--Other Indirect Actions, for "Water Supply Desalination" indicates that during operations the water supply desalination option would have significant unavoidable impacts related to biological resources, greenhouse gas emissions, hydrology and water quality, and utilities and service systems. According to the table, potentially significant and unavoidable impacts could occur during</p>	<p>Please see response to comments 1166-68 and 1166-158. The summary table ES-22 is a summary of the determinations that are discussed in Section 16.2.6, Water Supply Desalination, and elsewhere in Chapter 16, Evaluation of Other Indirect and Additional Actions.</p>

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		<p>construction for the following topics: aesthetics, agriculture and forestry resources, air quality, cultural resources, geology and soils, hazards and hazardous materials, land use and planning, public services, recreation, and transportation and traffic; and would have no impacts on mineral resources or population and housing. No text is provided explaining these impact conclusions or linking them to the discussion in Section 6.2.6. While the basis for the conclusions in the summary table is not obvious, it is reasonable to assume that the severity of many of the impacts identified for the BARDP would increase with a larger plant, and that some additional impacts may remain significant after mitigation. Considering the significant unavoidable impacts that were identified in the WSIP PEIR and the impacts and issues that remain to be addressed following the BARDP Site Specific Delta Modeling Report, it is reasonable to expect that a desalination plant at Mallard Slough with twice the intake capacity assumed for the BARDP could have significant unavoidable impacts on biological resources including endangered species, water quality and hydrology, and potentially significant unavoidable impacts related to greenhouse gas and air pollutant emissions. Energy demand for a large plant could result in adverse impacts on utilities and service systems, which may be the reason the SED executive summary table identifies this impact significant and unavoidable. The inadequacy of the impact analysis thus raises additional questions about the feasibility of the desalination plant anticipated in the SED because, given its probable environmental impacts, it is far from obvious such a plant could be permitted.</p>	
1166	160	<p>[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: The water quality and hydrology modeling conducted for the BARDP Site Specific Delta Modeling Report assumed a facility with half the capacity of that proposed in the SED. Without providing any support for the statement, the SED asserts that "a facility that is larger than the BARDP (e.g. 56,000 AF/y) would have similar types of construction and operation impacts" and does not address the effect of the larger plant. While it is reasonable to assume that a larger facility would have similar types of impacts, arguably the severity, and potentially the significance, of some impacts would increase with a larger project.</p>	<p>Please see response to comments 1166-68 and 1166-158.</p>
1166	161	<p>[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: The SED states that "the increased electrical demand as a result of a larger design capacity. . . could result in increases in GHG emissions and air quality impacts under operating conditions" presumably compared to the impact associated with the amount of GHG emissions identified for the BARDP, but does not elaborate on the environmental implications of the increased electrical or energy demand.</p>	<p>Please see response to comments 1166-68 and 1166-158.</p>
1166	162	<p>[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: Pumping rates greater than the 25 mgd diversion volume evaluated in the BARDP Site Specific Delta Modeling Report could result in exceedance of 0.2 feet per second approach velocity [Footnote 19: BARDP Site Specific Delta Modeling Report, p. 73, Table 2-1.], which is the limit on approach</p>	<p>Please see response to comments 1166-68 and 1166-158. As noted in Chapter 16, Evaluation of Other Indirect and Additional Actions, long-term operational impacts associated with a large desalination facility with a capacity of 56,000 AF/y would be similar in nature but greater in magnitude to those described in the BARDP feasibility studies as well as in the WSIP PEIR for the BARDP, and are primarily related to marine life entrainment, brine outfall, and impact on open space and recreation areas.</p>

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		velocity established by the USFWS to protect Delta smelt. [Footnote 20: BARDP Site Specific Delta Modeling Report, p. 78, Section 2.5.5.] The SED fails to address the potential impact of increased intake volume related to compliance with approach velocity requirements and smelt entrainment. The SED also fails to discuss whether other measures identified in the BARDP modeling report to reduce the risk of entrainment (such as adaptively determining the BARDP diversion rate based on real-time field monitoring, decreasing the slot size of the Mallard Slough Pump Station screen, and relocating the intake to the main channel) would also be effective and feasible for the larger facility.	
1166	163	[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: Although the capacity of the existing intake is 40 mgd [Footnote 21: MWH, Pilot Testing at Mallard Slough Pilot Plant Engineering Report, p. 1-22.], the SED fails to address potential impacts associated with construction of a new intake having the capacity to accommodate the 50 mgd source water diversion rate needed for the larger facility. Temporary disturbance of bottom sediments could cause water quality degradation from chemicals in sediments or construction materials during intake construction. The capacity of the existing 40 mgd pump station would also need to be increased, which could also result in construction-related impacts.	Please see response to comments 1166-68 and 1166-158.
1166	164	[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: The SED assumes that brine generated by a larger facility would be blended with the dry weather outflows of the two wastewater treatment plants currently proposed to be used by the BARDP (CCCSO or DDSD). However, the larger proportion of brine generated by the larger desalination plant to treatment plant outflow would potentially result in greater water quality impacts than currently discussed in the SED, which does not provide meaningful, substantive consideration of the water quality impacts of increased brine discharge.	Please see response to comments 1166-68 and 1166-158.
1166	165	[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: The SED cites the BARDP Site Specific Delta Modeling Report conclusion that “during critically dry water years, BARDP operations would need to be coordinated with CVP, SWP, and the City of Antioch operations to avoid impacts” on water quality from brine discharge (SED p. 16-74), but does not provide meaningful, substantive consideration of the potential for such coordination to successfully avoid water quality impacts, given the larger source water intake and brine discharge volumes. It is reasonable to expect that doubling the brine discharge alone would make avoidance of impacts substantially more challenging, and increase the likelihood that water quality impacts would not be avoided.	Please see response to comments 1166-68 and 1166-158.
1166	166	[From ATT7:] Failure to Adequately Address or Identify Impacts Because the SED largely relies on the BARDP Site Specific Delta Modeling Report, which addresses effects of a smaller desalination project, the SED fails to adequately address or identify the impacts of the larger desalination project envisioned in the SED, as follows: The SED acknowledges that desalination facilities "are typically relatively energy intensive" and therefore a larger facility	Please see response to comments 1166-68 and 1166-158.

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		<p>would increase GHG and air pollutant emissions, but fails to evaluate the effects of the energy requirements of the larger desalination facility envisioned in the SED on local or regional energy supplies or facilities or whether it would result in the need for additional capacity. The discussion of impacts identified in the WSIP PEIR (SED p. 16-74) states that mitigation "could likely" reduce impacts on public services and utilities to a less than significant level, whereas SED Table ES-22 indicates that the impacts of desalination plant operations on utilities and service systems are expected to be significant and unavoidable.No meaningful explanation is provided for either conclusion. [Footnote 22: Complicating the referenced discussion on p. 16-74, is the fact that the discussion refers to SED Appendix H, which largely consists of a table of measures identified in the WSIP PEIR to mitigate the impacts of the WSIP Advanced Disinfection Project. Appendix H acknowledges that additional measures may be needed for desalination facility impacts, but it does not discuss either impacts or mitigation related to increased power demand.]</p>	
1166	167	<p>[From ATT7:] The SED fails to adequately consider the potential for operations at the desalination plant to result in impacts related to the use of chemical transport and storage, dismissing the increase in chemical use as negligible because the desalination plant would likely be constructed within or adjacent to existing treatment facilities (SED p. 16-74). However, as stated on p. 16-71, the SED analysis assumes the desalination plant and intake would be "located at the existing Mallard Slough intake/pump station site." The pump station is not within or adjacent to a water treatment facility, and chemical use at the pump station would likely be much more limited than at a treatment facility. In addition, the type of chemicals needed for operation of a reverse osmosis desalination plant may differ from those used at a traditional water treatment plant. In addition, the area from the pump station site at the end of Mallard Slough to Suisun Bay appears largely to be wetlands, which may be particularly vulnerable to the effects of an accidental hazardous materials spill. Therefore the SED characterization of the increase in chemical use and storage at the proposed desalination plant site is unsupported.</p>	<p>Chapter 16, Evaluation of Other Indirect and Additional Actions, has been modified such that an assumption that the desalination facilities would likely be constructed within or adjacent to existing treatment facilities is no longer part of the analysis. Additional clarifying text has been added that refers to the significance impact determination in the WSIP PEIR related to the release of hazardous materials. These revisions do not change impact determinations or conclusions identified in the SED.</p>
1166	168	<p>[From ATT7:] Impacts Associated With Different Geographies The SED acknowledges, but does not describe in any detail or draw any conclusions about the geographical differences between the San Francisco Bay-Delta and coastal Carlsbad and how these differences might affect impacts. The differences in geography (as well as differences in some project facilities) that could affect typical desalination plant impacts include: Brine disposal location. The Carlsbad project disposes brine through the adjacent power plant's existing cooling water discharge system to the ocean, where mixing conditions disperse the discharged brine. Modeling conducted for the Carlsbad EIR showed "the importance of 'in-the-pipe' dilution and natural mixing conditions as a means of diluting and dispersing the [reverse osmosis] plant discharge." [Footnote 23: City of Carlsbad, Supplement to the Precise Development Plan and Desalination Plant Project Final Environmental Impact Report, Section 4.3 Biological Resources, page 4.5-50.]By contrast, the 50 mgd desalination project assumed in the SED would dispose of brine by blending with WWTP effluent (assuming available outfall capacity) prior to release into Suisun Bay. Thus, the hydrology and water quality issues would be different. Whereas the Carlsbad plant uses an existing power plant outfall located in an area with natural mixing conditions that speed the dilution of the discharge, the WWTP outfalls that may be used in Suisun Bay are likely to be located in lower energy environments with lower mixing potential compared to the ocean. In addition, the mixing or in-pipe dilution ratios for the Carlsbad facility are not discussed and could be very different than the SED desal option. There could be a higher brine-to-effluent ratio at the Delta WWTP outfalls resulting in less dilution prior to discharge compared to the brine-</p>	<p>Please see response to comment 1166-68 and response to comment 1166-158. The Carlsbad Facility is included in Section 16.2.6 because it is one example of a desalination facility in California and is a point of reference for the costs associated with desalination as well as some of the types of impacts. As noted in Chapter 18, Summary of Impacts and Comparison of Alternatives, Table 18-6, CEQA Significance Summary of LSJR Alternatives-Other Indirect Actions, hydrology and water quality impacts of water supply desalination are determined to be significant and unavoidable and this impact would likely be primarily driven by operations, as noted in the table. This is based on the information contained in Section 16.2.2 from the WSIP PEIR and the BARDP Final Report. For example: "It was determined in the WSIP PEIR impact analysis that operation of the BARDP would result in its impacts on hydrology and water quality, biological resources, and energy resources. Although potential water quality impacts due to brine and associated impacts on biological resources (specifically, aquatic resources including special-status species) for the BARDP could potentially be mitigated through design/operation, mitigation measures, and regulatory compliance, the impact was considered significant and unavoidable, to be conservative (SFPUC 2008)."</p>

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		<p>to-cooling water ratio at Carlsbad, which could affect the degree of potential impact. The Delta is already a stressed estuarine ecosystem that could be more sensitive to a steady influx of brine than would the ocean environment. If the purpose of including information about the conclusions of the Carlsbad analysis was to suggest that a large plant in the Delta would have similar less than significant impacts, the SED analysis was deficient in not providing more information on how differences in geography could change conclusions about impacts.</p>	
1166	169	<p>[From ATT7:] Impacts Associated With Different Geographies The SED acknowledges, but does not describe in any detail or draw any conclusions about the geographical differences between the San Francisco Bay-Delta and coastal Carlsbad and how these differences might affect impacts. The differences in geography (as well as differences in some project facilities) that could affect typical desalination plant impacts include: Intake location. Impingement and entrainment of aquatic species at open water intakes are key concerns associated with desalination plant operations. The Carlsbad project does not require a new intake; instead it diverts spent cooling water from an adjacent power plant’s cooling water discharge system as its source water. The power plant intake draws water from a constructed lagoon and discharges to the ocean. According to the Carlsbad EIR (pages 4.3-35 and 4.3-42), the desalination plant operation would not require the power plant to increase the quantity of water withdrawn nor would it increase the velocity of the water withdrawn and therefore would have no impingement-related impacts. The only entrainment impacts the Carlsbad plant would have are to organisms that survived the power plant intake and cooling system. The EIR found that because the additional effect on larval fishes would be very low and because the most frequently entrained species had widespread distribution and high reproductive potential, the ecological effects due to any additional entrainment from the desalination plant was less than significant. Unlike the Carlsbad plant, a new intake would be required for the desalination plant envisioned in the SED at the Mallard Slough site. The magnitude of effects of an open water intake depends in part on the sensitivity of the specific area. The Delta is recognized to be an important ecosystem that provides habitat for endangered species and is already under considerable environmental stress. Therefore, entrainment and impingement effects of an intake in the Delta would very likely have greater impacts on endangered or other special status species than an intake at Carlsbad.</p>	<p>Please see response to comment 1166-68, response to comment 1166-158 and response to comment 1166-168. As noted in Chapter 18, Summary of Impacts and Comparison of Alternatives, Table 18-6, CEQA Significance Summary of LSJR Alternatives-Other Indirect Actions, biological resource impacts of water supply desalination are determined to be significant and unavoidable and this impact would likely be primarily driven by operations, as noted in the table. This is based on the information contained in Section 16.2.2 from the WSIP PEIR and the BARDP Final Report. For example: “Long-term operational impacts associated with a large desalination facility with a capacity of 56,000 AF/y would be similar in nature to those described in the feasibility studies as well as in the WSIP PEIR for the BARDP, and are primarily related to marine life entrainment, brine outfall, and impacts on open space and recreation areas.”</p>
1166	170	<p>[From ATT7:] Impacts Associated With Different Geographies The SED acknowledges, but does not describe in any detail or draw any conclusions about the geographical differences between the San Francisco Bay-Delta and coastal Carlsbad and how these differences might affect impacts. The differences in geography (as well as differences in some project facilities) that could affect typical desalination plant impacts include: Air basin status. In reference to the Carlsbad facility, the SED states that “[c]umulative regional impact [sic] on air quality for the production of ozone and PM10 were determined to be significant and unavoidable,” which would presumably indicate that the SED has determined the air quality impact of the proposed larger facility would be significant and unavoidable based on production of ozone and PM10. This conclusion from the Carlsbad facility environmental analysis is based on the existing air quality in the Carlsbad air basin. The San Francisco Bay Air Basin, to which the SED facility would contribute emissions, is also designated non-attainment for state and federal standards for PM2.5, which is not discussed in the SED impact evaluation. Moreover, the SED Executive Summary impact table ES-22, CEQA Significance Summary of LSJR Alternatives--Other Indirect Actions, indicates that the SED Water Supply Desalination project would not have significant unavoidable air quality</p>	<p>Please see response to comment 1166-68, response to comment 1166-158 and response to comment 1166-168. As noted in Table ES-22 and Chapter 18, Summary of Impacts and Comparison of Alternatives, Table 18-6, CEQA Significance Summary of LSJR Alternatives-Other Indirect Actions, air quality impacts of water supply desalination are determined to be significant and unavoidable. While the table notes this impact would be primarily driven by construction, it is noted in the text in Chapter 16, Evaluation of Other Indirect and Additional Actions, that there could be significant impacts to air quality under operation. This is based on the information contained in Section 16.2.2 from the WSIP PEIR: “Because of this limited project-specific information, it was generally determined that most of the potential impacts associated with construction and operation of a desalination plant and associated facilities would be potentially significant for the following resources: land use and visual quality; geology, soils, and seismicity; air quality; cultural resources; GHG emissions; hazards; noise and vibration; traffic, transportation, and circulation; public services and utilities; recreational resources; and agricultural resources (SFPUC 2008). However, for these resources it was presumed that potentially significant impacts could be avoided or reduced to a less-than-significant level through site selection, project design, and implementation of “environmentally-sensitive” construction and operation techniques or through implementation of mitigation measures (SFPUC 2008).”</p>

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		impacts during operations. The SED also fails to explain the conclusion reflected in Table ES-22 that the air quality impact of desalination facility operations would not be significant, or if significant, could be mitigated.	
1166	171	[ATT8: Appendix 6. Memo to San Francisco City Attorney’s Office from Leslie Moulton-Post, Jill Hamilton, and Chris Mueller of Environmental Science Associates. "Adequacy Review of In-Delta Diversion Alternative Analysis in the State Board SED." March 15, 2017 ]	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.
1166	172	[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED. Feasibility. The SED does not substantiate the assumption that the in-Delta Diversion option is feasible. The SED identifies some of the factors identified in the [SFPUC] WSO [Water Supply Options] report that are critical to the feasibility of this option while ignoring others. The WSO report (page 5-11) clearly states that "In the case of the Delta diversion alternative, the likelihood of obtaining a long-term water sale contract and a through-Delta wheeling contract is considered extremely low. Furthermore, any Delta wheeling agreement would be subject to environmental pumping restrictions, and the SFPUC would be considered last in line" behind CVP or SWP contractors. In the performance evaluation of the Delta diversion option (Table 5-2, page 5-8), the WSO report indicates that "Dry year purchases may be especially difficult to negotiate," that there would be a "Potential diminution of supply from potential regulatory ‘droughts’ associated with the ESA [Endangered Species Act]," and that with the In- Delta Diversion the SFPUC would experience a "Risk of not serving full demand within [the] modeled delivery window." Regarding the competition the SFPUC would face in obtaining additional supplies, the detailed evaluation of the WS3-1 option in Appendix C of the WSO report recognizes that "SWP and CVP contractors are looking for supplemental water supplies, particularly during drought years. . ."Recognizing that it was "highly unlikely" that the SFPUC would achieve year-round diversions (WSO report page 5-1), the WSO analysis assumed that at best the SFPUC would be limited to receiving its annual Delta water supply during a three-month period, and sized facilities accordingly. Yet the WSO report (WSO report, Appendix C, page 5-7) also indicates that the in-Delta diversion project may have even less than a three-month period during which water could be diverted, and that the proposed facilities may therefore need to be larger than those described. Larger facilities, if feasible, could cause additional and/or more severe environmental impacts, including disturbance or loss of agricultural land, wildlife habitat, or open space, because a larger area would be needed for larger-capacity diversion and treatment facilities; increased energy demand with associated air quality and GHG-related impacts; and increased potential for soil erosion and associated degradation of surface water quality, among other potential effects. The potential need for or feasibility of larger facilities and associated impacts were not addressed in the SED. The WSO analysis stated that additional studies would be needed to determine whether the SFPUC could accommodate the diversion of the 28,000 acre-feet per year (afy) annual supply over a period less than three months. As the SED acknowledges (Draft 2016 SED at 16-68), the volume of water considered in the WSO report (28,000 afy) is substantially less than the reductions of SFPUC deliveries that could occur in drought years under LSJR alternatives.	Please see the response to comments 1166-76 and 1166-158.
1166	173	[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED. Outdated	Please see response to comment 1166-76.



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		<p>Information About Facility Site Availability. The analysis presented in the SED relies on outdated information and, therefore, fails to provide a complete analysis of feasibility and environmental effects. As indicated in the sources listed at the end of the table included in SED Appendix H, Attachment 2 (Annual Delta Diversion--Environmental Issues), the environmental investigations were conducted in 2004 and 2005. No attempt was made to verify whether substantive changes have occurred in the physical or regulatory settings, which in turn affect the feasibility of the project and impact significance. After approving the WSIP in 2008, the SFPUC has proceeded to implement many of the Capital Improvement Projects called for in the WSIP, including several at and in the immediate vicinity of the facility locations identified in the SED. As a result, much of the area identified for the 18-acre water treatment plant at the Tesla Portal is now occupied by other facilities, a fact that undermines the conclusion in the SED that this site could accommodate the needed facilities. (The WSO report acknowledges that other WSIP projects are planned at Tesla and that locations would need to be coordinated.) This information was readily available had the EIR preparers consulted Google Earth. Further, implementation of the San Joaquin Pipeline System Project may have constrained the SFPUC's ability to site another large-diameter pipeline within the San Joaquin Pipelines right-of-way, another new fact raising a substantial project feasibility issue.</p>	
1166	174	<p>[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED. Inadequate Environmental Analysis and Failure to identify Significant Impacts. The westernmost portion of the San Joaquin Pipeline System Project, one of the SFPUC's WSIP projects, substantially overlaps with the locations identified for the Delta Diversion facilities. The San Joaquin Pipeline System Project includes various pipeline improvements between Foothill Tunnel at Oakdale Portal and the Coast Range Tunnel at Tesla Portal as well as facility improvements at Tesla Portal. The project includes a new pipeline beginning west of the San Joaquin River and ending west of Tesla Portal. Presumably the SFPUC's pipeline right-of-way west of the Delta Mendota Canal is similar to (or the same as) the alignment assumed in the SED for the in-Delta Diversion option. The EIR for the San Joaquin Pipeline System Project [Footnote 2: San Francisco Planning Department, Final Environmental Impact Report, San Joaquin Pipeline System Project, State Clearinghouse No. 2007032138, San Francisco Case No. 2007.0118E, June 11, 2009.], which the City and County of San Francisco certified in 2009, identifies several significant impacts not identified in the SED that implementation of the Delta Diversion facilities would most likely also have, including the following: Impacts to the following special status species were not identified in the SED for Delta Diversion Facilities:</p> <ul style="list-style-type: none"> <li>-Special status bats</li> <li>-American badger</li> <li>-White-tailed kite</li> <li>-Northern Harrier</li> <li>-Golden Eagle</li> <li>-Aleutian cackling goose</li> </ul>	<p>Please see response to comment 1166-76. As indicated in Chapter 16, Evaluation of Other Indirect and Additional Actions, the precise location, size, timing of construction, and details of an in-Delta diversion project cannot be known at this time. The environmental evaluation in Chapter 16 presented information from the preliminary analysis of environmental effects of a conceptual Delta diversion facility included in the Water Supply Options (WSO) report (San Francisco Public Utilities Commission 2007). As indicated in Chapter 16, Attachment 2 of Appendix H, Supporting Materials for Chapter 16, identifies, by resource, environmental effects of the conceptual plan, as well as mitigation measures, identified in the WSO. In that analysis, Swainson's hawk, California tiger salamander, burrowing owl, San Joaquin kit fox, and California red-legged frog are included as species that may be affected by the Delta Diversion. The information provided by the comment is not inconsistent with the impact determinations summarized in Chapter 18, Summary of Impacts and Comparison of Alternatives, in Table 18-6, CEQA Significance Summary of LSJR Alternatives- Other Indirect Actions, for the in-Delta diversion. This summary table, based on information in Section 16.2.5, In-Delta Diversion, from the WSO, indicates that there may be significant and unavoidable impacts on biological resources (i.e., special status species); cultural resources (i.e., paleontological and historical); air quality; and utilities and public services. As noted in the Table 18-6, these significant and unavoidable impacts are driven primarily by construction activities.</p>

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Ltr#	Cmt#	Comment	Response
		<p>-Loggerhead shrike</p> <p>-Tricolored Blackbird</p> <p>-Raptors and migratory birds</p> <p>-Western Pond Turtle</p> <p>-San Joaquin whipsnake and California Horned LizardsImpacts to paleontological resources due to excavation in fossil bearing soils Impacts to historic resources. The EIR identifies the following facilities are potentially eligible for the National Register of Historic Places and California Register of Historic Places</p> <p>-Delta Mendota Canal</p> <p>-California Aqueduct</p> <p>-San Joaquin Pipelines 1 and 2Air Quality: potential exposure to emissions and odors from pockets of methane and hydrogen sulfide that could be encountered and released during tunneling operations for crossing under Interstate 5, Interstate 580, Chrisman Road, and potentially under other infrastructure.Utilities and Public Services: Pipeline construction could result in potential damage to or disruption of regional and local public utilities including natural gas pipelines, electric lines, oil pipelines, and local water lines that cross or extend along the SJPL right-of-way west of the Delta Mendota Canal and California Aqueduct (SJPL FEIR, at 4.13-32 and Figures 4.13-1(d) and 4.13-1(e)).</p>	
1166	175	<p>[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED.Selective Inclusion and Exclusion of Information. The SED chooses to include some information from the [SFPUC] WSO [Water Supply Options] report concerning environmental impacts but excludes other information. The SWRCB selected information in an appendix of an appendix to the WSO report without referencing discussions of environmental issues identified in the main body of the WSO report. The material relied on in Appendix H of Appendix C of the WSO report focuses on impacts associated with facility construction; it does not address effects of facility operation on the Delta and elsewhere. With respect to impacts to the Delta, the WSO report (Table 5-2, page 5-8) acknowledges that the hydrologic and biological effects to the Delta from operation of a Delta Diversion are unknown. Table 5-2 (page 5-8 to 5-9) also identifies numerous water quality issues and effects on water users and seismic risks associated with the use Delta supplies. The Delta is subject to liquefaction; an earthquake could result in widespread levee failures, impairing the ability of the CVP and SWP to operate. Potential impacts to the SFPUC include service interruptions, construction of new facilities to alleviate the risk of failure and service interruptions during its construction, and higher costs.</p>	Please see response to comment 1166-76.
1166	176	<p>[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED.Inappropriate Basis for Conclusions Regarding Impact Significance. The SED makes inappropriate comparisons to draw conclusions about the significance of impacts associated with the Delta Diversion option. Elsewhere, unsubstantiated, conclusory statements are also</p>	Please see response to comment 1166-76.

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Ltr#	Cmt#	Comment	Response
		relied on.	
1166	177	[From ATT8:] General Comments of Adequacy of Description, Feasibility and Environmental Evaluation of In-Delta Diversion Option ESA has identified several deficiencies in the description and the analysis of the in-Delta Diversion option presented in the SED. Impacts Associated with Differences in Project Characteristics. The SED acknowledges that the Delta Diversion as characterized in the [SFPUC] WSO [Water Supply Options] report would not have sufficient capacity to offset the supply shortages associated with some of the LSJR Alternatives; thus, the SED relies on environmental evaluation of a smaller project than would be needed. However, the report does not provide meaningful, substantive consideration of the differences, in terms of how the in-Delta Diversion would be implemented under the SED compared to the WSO concept, and how the impacts disclosed might also differ if the project were of a larger capacity.	Please see response to comment 1166-76.
1166	178	[From ATT8:] The statement in the SED discussion of In-Delta Diversions (SED, page 16-68) that "Reductions in surface water diversions are possible as a result of approving an LSJR alternative and the respective program of implementation" is an understatement. It is reasonably foreseeable that reductions in surface water diversions would be an inevitable consequence of approval and implementation of LSJR Alternatives 2, 3 or 4 because, as the analysis presented in SED Appendix L shows, CCSF would have a water bank deficit under baseline conditions based on both (1) analysis of a six-year drought and (2) the 21- year period of record (SED Appendix L Tables L.4-2 and L.4-3, respectively). In both cases (each analyzed under two scenarios [Footnote 3: The scenarios consist of two potential interpretations of responsibilities under the Fourth Agreement between CCSF, Turlock Irrigation District, and Modesto Irrigation District.]), the deficits would increase under Alternatives 2, 3, and 4. Moreover, the description of every other indirect and additional action identified in Chapter 16 indicates that reductions in surface water diversions are expected as a result of approval and implementation of an LSJR alternative (Draft 2016 SED, page 16-5, 16-16, 16-40, 16-48, 16-70 and 16-75).	Please see response to comment 1166-76.
1166	179	[From ATT8:] The statement (SED, page 16-68) that the project as described in the [SFPUC] WSO [Water Supply Options] "would require relatively little new infrastructure" mischaracterizes this option, which would require a new intake on the Delta Mendota Canal or California Aqueduct, a pumping plant, a large-diameter (60-inch) pipeline, a new water treatment plant occupying 18 acres, and a blending facility.	Please see response to comment 1166-76. As described in Chapter 16, Evaluation of Other Indirect and Additional Actions, Section 16.2.5, under "Summary of Potential Action," the project would include a new Delta intake and pumping plant, a new pipeline, a new Delta water treatment plant, and a new blending facility at Tesla Portal—a description consistent with what is outlined in the Water Supply Options report (SFPUC 2007). This description at the beginning of Section 16.2.5, In-Delta Diversions has been changed to be more consistent with the description under "Summary of Potential Action." This modification does not change impact determinations or conclusions identified in the SED.
1166	180	[From ATT8:] The SED states (SED, page 16-68) "These reductions in surface water could potentially affect SFPUC by reducing some portion of its current water supply obtained from the Tuolumne River during a 6-year drought, as described in Appendix L, City and County of San Francisco Analyses." However, the analysis prepared by Matt Moses (2017) indicates that the modeling conducted by SWRCB underestimates the severity of water shortages that would affect San Francisco. [Footnote 4: For example, assuming San Francisco was responsible for bypassing flow in compliance with a 40 percent unimpaired flow objective on the Tuolumne River, and a reoccurrence of 1987-1992 hydrology, San Francisco's water supply would be reduced by 129,884 afy for each of the 6 years of the drought, resulting in a loss of an additional 10,884 afy, or 65,304 acre-feet in total for the 6-year period, as compared to the State Water Board's calculations. See Declaration of Matt Moses in Support of Comments by the City and County of San Francisco to the Draft Substitute	Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for information about the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC RWS service area that could result from implementing the plan amendments, and the types of water supply management strategies that water suppliers can take to in response to potentially reduced water supplies. Please see Master Response 3.2, Surface Water Analyses and Modeling, for a discussion of the accuracy of modeling assumptions and flow calculations.

**Table 4-1. Responses to Comments**

Ltr#	Cmt#	Comment	Response
		<p>Environmental Document in Support of Potential Changes to the Bay-Delta Plan ("Moses Decl."), Attachment 1 [ATT4:ATT1], SFPUC Analysis of Proposed Changes to Tuolumne River Flow Criteria, March 2017, at 16, Table 9. C.f. SED, Appendix L, at L-21, Table L.4-2 (where the SED estimates that, assuming a reoccurrence of 1987-1992 hydrology, the largest potential water supply reduction San Francisco could experience if the State Water Board implemented a 40 percent unimpaired flow objective on the Tuolumne River would be 119,000 afy for each year of a 6-year drought).]</p>	
1166	181	<p>[From ATT8:] The SED states (SED, page 16-68) "As described in SFPUC documents, specifically the Water Supply Options (WSO) report (SFPUC 2007), SFPUC has several options for augmenting or increasing its water supply including diverting water from the Sacramento-San Joaquin Delta (Delta)." It would be more accurate to say that SFPUC has evaluated several options for augmenting or increasing its water supply, some of which--including in-Delta diversions--the SFPUC concluded had an extremely low chance of successful implementation (see WSO report page 5-11). The SED fails to support why this option is now considered feasible.</p>	Please see response to comment 1166-76.
1166	182	<p>[From ATT8:] The SED states (SED, page 16-68): "In the 2008 WSIP Programmatic Environmental Impact Report (PEIR), SFPUC concluded that the in-Delta diversion option was infeasible, in part, because it would not achieve consistent year-round diversions due to uncertainties regarding the availability of water supplies and pumping capacities (SFPUC 2008). Nonetheless, a discussion of this possible water supply option has been included in light of the changing circumstances since 2008 (e.g., Pelagic Organism Decline, climate change, California WaterFix, and the State Water Board's Final Report on the Development of Flow Criteria for the Sacramento Delta Flow Criteria [State Water Board 2010])." a. The discussion selectively addresses some of the reasons why this potential alternative in the WSIP PEIR was found to be infeasible but ignores others. For example, the PEIR also states (page 9-126) that because of the numerous institutional and regulatory uncertainties associated with this alternative (largely dependent on how and where the SFPUC would purchase the water), it was unknown if this alternative could achieve the WSIP level of service goals for delivery and water supply reliability. The PEIR also notes that the quality of Delta water supplies would be lower than water in the Hetch Hetchy system, and that while this alternative would avoid or reduce impacts on Tuolumne River resources that would occur under the WSIP (as proposed), "it would result in other, distinct significant environmental impacts on the Delta and associated environmental resources (e.g., fisheries, aquatic habitat and species, riparian habitat, and water quality affecting other beneficial uses)." Regarding impacts associated with facility construction and operation, the PEIR found that the Delta Diversion alternative would neither avoid nor lessen the effects that would result from construction and operation of WSIP improvement projects, and that facilities beyond those required for the WSIP would need to be constructed and operated. The PEIR states that these facilities would be located in a combination of open space, rural settings, and dense urban settings, resulting in a range of additional environmental impacts. Thus, the Delta Diversions alternative was eliminated from further consideration in the WSIP PEIR because it would have uncertain water supply reliability and an unknown ability to reduce impacts on Tuolumne River resources, as well as significant additional environmental impacts. b. The discussion does not explain here--or anywhere--how the "changing circumstances" now render this potential alternative feasible. While the referenced changed or changing circumstances would be reasons to reassess the potential feasibility and impacts of an alternative previously considered feasible, all of the circumstances in this list raise concerns of more restrictive environmental conditions and</p>	Please see response to comment 1166-76.

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Ltr#	Cmt#	Comment	Response
		therefore greater project impacts and/or stricter regulation that likely make a new in-Delta diversion even less feasible.	
1166	183	[From ATT8:] The California WaterFix has not yet been approved and implemented, and as such its characteristics may change. We are not aware of any information in the record for the WaterFix proceeding which suggests that project could serve additional users such as the SFPUC or make through-Delta transfers and in-Delta diversions more feasible.	Please see Master Response 1.1, General Comments, for responses to general comments and information related to the California WaterFix.
1166	184	<p>[From ATT8:] The SED states (SED, at 16-68): "A Delta diversion project would potentially allow SFPUC to use any of the rivers that flow into the Delta as a water supply source, instead of the Tuolumne River. Under this type of project, it is anticipated water would be purchased from any user upstream from the Delta or from a State Water Project (SWP) or Central Valley Project (CVP) contractor south of the Delta. A new connection to either the California Aqueduct or the Delta-Mendota Canal would be constructed to accommodate the transfer." This subject text implies that flows from the Lower San Joaquin and Sacramento Rivers are a readily available water supply source. CCSF is not currently a CVP or SWP contractor. As a result, the WSO [Water Supply Options report] (Appendix C, pp. 5-3-5-8) identifies numerous constraints regarding supply availability and reliability that are not addressed in the SED. These include: a. "The SWP and CVP provide preference to existing contractor deliveries and diversions . . . noncontractor diversions are considered the lowest priority (the SFPUC is a non-contractor for both projects)." (WSO Report Appendix C at 5-5.) Both the SWP and CVP systems are already oversubscribed under current conditions; thus, it is questionable just how readily available long-term contracts are. According to the DWR's State Water Project Final Delivery Capability Report 2015 (page 127, Table 6-4), the estimated long term average deliveries to SWP contractors under existing conditions is only 62 percent of the contractors' maximum Table A amounts, and far less than this (28 to 33 percent) during dry periods. As stated in the WSIP PEIR (page 9-26), "The agencies with the rights to the greatest quantities of water in the state, the U.S. Bureau of Reclamation (USBR) and California Department of Water Resources (DWR), would not be sources of new water supply contracts/agreements because of their commitments to existing contractors and to the protection, restoration, and enhancement of fish and wildlife habitat. Challenges to water purchases and transfers pertain to restrictions associated with entitlements, contracts, and water rights; permitting requirements; effects caused by the cessation of water application to an area (e.g., land fallowing, economic impacts); Delta pumping restrictions; and wheeling arrangements."The SWRCB did not contact either DWR or USBR as to whether these agencies consider the in- Delta diversion as characterized in the SED to be feasible, or whether water released from either state or federal water project storage would be available for transfer to non-contractors. At a minimum, the SED should acknowledge that the ability of the SFPUC to secure one or more long-term water contracts is speculative and outside the control of the SFPUC. This is a matter of public record. b. Given that these systems are already oversubscribed, it is reasonable to conclude that any long-term transfer of contract water, or any other water rights or supplies, would be strongly opposed by existing downstream SWP and CVP contractors, in-Delta diverters, etc. b. Any such long-term transfer of contract water should include an analysis of system hydraulics and hydrologic assumptions, under varying conditions, quantitatively demonstrating the effects of such transfers on downstream contractors, in-Delta diverters, etc. Alternatively, the SED should acknowledge that downstream contractors may be adversely affected. Section 16.2.5 includes the following statement: "The size of the [in-Delta diversion] project may need to be larger than what was examined in the WSO report." The SED does not provide any information that demonstrates this alternative is feasible, nor</p>	Please see response to comment 1166-76.

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Ltr#	Cmt#	Comment	Response
		has it substantiated assertions that changing conditions make an in-Delta diversion option more feasible today than in 2005. This statement, indicating that the diversion would need to be larger than that considered and rejected for the WSIP PEIR, further undermines the SED conclusion that the in-Delta diversion is a feasible option to offset the supply shortages to the SFPUC associated with some of the LSJR Alternatives.	
1166	185	[From ATT8:] The statement that, "Effects associated with exporting water from the Delta are being debated and analyzed by U.S. Bureau of Reclamation (USBR), DWR, and various fisheries agencies as part of the California WaterFix process" (SED, at 16-69) implies that those analyses are evaluating an in-Delta diversion by the SFPUC as part of California WaterFix. While the WaterFix identifies SWRCB's Delta Water Quality Control Plan update as a cumulative project (and the SED identifies the WaterFix as a cumulative project), there is no evidence that in-Delta diversions by the SFPUC discussed in SED Chapter 16 were modeled or considered feasible in WaterFix analyses.	Please see Master Response 1.1, General Comments, for information related to the California WaterFix. The SED does not imply that WaterFix is evaluating an in-Delta diversion by SFPUC. The sentence has been revised and the revision does not change any conclusions within Chapter 16, Evaluation of Other Indirect and Additional Actions, or the SED.
1166	186	[From ATT8:] The SED states (SED, page 16-69): "If water was purchased from a contractor upstream of the Delta, there may be an increase in Delta exports, which could affect Delta fish. This effect would likely be very small due to the size (39 cfs to SFPUC versus 10,000 cfs of combined exports) and would be minimized by operating under current fisheries agencies and State Water Board regulations and requirements." It is a well-established principle in analyzing impacts under CEQA that the relevant question to be addressed is not the relative amount of change compared to adverse effects that have already occurred, but whether any additional amount of impact should be considered significant in light of the existing conditions. To claim that the effect of diverting 39 cubic feet per second would be "very small" is not a substitute for an actual analysis of the effects. Moreover, to claim that the effect would be "minimized" by operating under current fisheries agencies and State Water Board requirements does not prove that the diversion can be consistent with these restrictions.	Please see response to comment 1166-76. The SED appropriately assesses potential impacts in light of existing information and conditions. The SED adequately evaluates the in-Delta diversion at the programmatic level because as is acknowledged in the WSO Report, project-specific details are unknown. For example, the WSO Report notes significant assumptions regarding the annual timing of diversions and south of Delta withdrawals. Other uncertainties include the location of seller, point of redirection, the variable export regime, and final terms of the water purchase. Moreover, any remaining impacts after measures that would be required by state and federal resource agencies with jurisdiction over the protection of fish and wildlife, including listed species, would be speculative. Thus, the project-specific impacts are speculative, as are the impacts at a programmatic level of assessment. Although the operational effects are speculative, the SED provides information about the potential impacts. The evaluation of an in-Delta diversion in Chapter 16, Evaluation of Other Indirect and Additional Actions, and in the 2007 SFPUC WSO Report, acknowledges that special-status fish species could be affected by construction and operation of such a project. Activities for large construction projects generally share common potential impacts, regardless of location. However, potential operational impacts are purely speculative as they are location-specific. As explained in the WSO Report, all diversions would be subject to regulatory requirements that protect species and are based on seasons and species occurrence. Also as stated in the WSO Report, if water is purchased from north of the Delta, the purchase of more water than would be diverted by SFPUC may be required to meet outflow requirements and other Delta standards. As the WSO Report further notes, in general, operational issues are expected to be minor. Nonetheless, it is reasonable to conclude that a 39 cfs diversion relative to CVP and SWP exports, in conjunction with appropriate regulatory requirements, would have minimal effects. Further, Appendix F.1, Hydrologic and Water Quality Modeling, includes an analysis of regulations that are most likely to control exports. This analysis shows that exports can increase a certain amount within existing regulations that are meant to protect fish (Table F.1.7-2b, Summary of Estimated Changes in Delta Exports [TAF]).
1166	187	[From ATT8:] The SED's analysis (SED, page 16-69) of the ability of the existing power grid to support pumping and treatment operations and, consequently, the need for new electrical facilities is inadequate and based on an inappropriate basis of comparison, as indicated in the following text: "Potable water treatment and pumping facilities are typically relatively energy intensive; however, the overall increased electrical load would be extremely small compared to the existing electrical load from the large Delta export pumps. Therefore, it is unlikely to require the construction of major new power generation or transmission facilities." Whether the overall increased electrical load (which is not quantified even in the broadest terms in the SED) would be small compared to the existing electrical load from Delta export pumps is immaterial and fails to answer the question of whether the existing	Please see response to comment 1166-76. The analysis acknowledges that potable water treatment and pumping facilities can be energy intensive, but without knowing the details of the capacity of the facility, how it will be run, or where the power would come from, it is appropriate to use the existing Delta export pumps as a point of reference for comparison. It would be speculative to try to determine what the change in net energy use of the entire RWS would be without knowing the details of the potential in-Delta diversion and treatment facility, the changes that may occur to the RWS upstream on the Tuolumne River, and how other indirect actions (i.e., water transfer(s)) may be considered and potentially affect energy generation.

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Ltr#	Cmt#	Comment	Response
		<p>facilities have remaining capacity or if new power generation or transmission facilities are needed. Indeed, with implementation of LSJR Alternatives 3 or 4 the CCSF would have even less energy at their disposal for operating the regional water system but greater energy needs due to additional pumping and treatment requirements, potentially increasing power generation demands. [Footnote 5: See Comments by the City and County of San Francisco to the Draft Substitute Environmental Document in Support of Potential Changes to the Bay-Delta Plan ("San Francisco's Comment"), at 63 (explaining that "if San Francisco was responsible for complying with a new unimpaired flow objective on the Tuolumne River, then during dry hydrologic conditions the SFPUC would be compelled to implement water supply rationing in order to preserve system storage. Consequently, less water would flow through the SFPUC's water supply delivery pipeline, thereby reducing hydropower generation at facilities situated along the route of the delivery pipeline, i.e., Kirkwood Powerhouse and Moccasin Powerhouse.").]</p>	
1166	188	<p>[From ATT8:] The SED states (SED, page 16-70) "The operation of Delta diversion facilities may require a slight increase in chemical transport and storage; however, because the facilities would likely be constructed within or adjacent to existing treatment facilities, the increase would be negligible compared to existing chemical use and transport at these locations." The statement inappropriately characterizes the effect of risks associated with increased chemical transport and storage as negligible based on the "small" increase in chemical use without either quantifying, even in the most general terms, what the increase in chemical use is, much less what the chemicals are. The existing "treatment" facilities at Tesla Portal simply provide disinfection; they do not provide filtration or include a water filtration plant. Delta water would require filtration and the full range of chemicals used by a modern filter plant. The WTP that would need to be constructed would therefore contain substantially more hazardous materials (water treatment chemicals) than existing operations at the Tesla Portal.</p>	<p>Please see response to comment 1166-76. Chapter 16, Evaluation of Other Indirect and Additional Actions, acknowledges that chemical storage, use, or transport for an in-Delta diversion facility may occur; however, it cannot provide an inventory of what chemicals might be used, the frequency and duration of their use, or other details that might be related to the capacity of the facility or when it is used. Chapter 16 has been revised such that an assumption that the in-Delta water treatment facilities would likely be constructed within or adjacent to existing treatment facilities is no longer part of the analysis. However, this revision does not change the associated impact determination or conclusions identified in the SED, which is based, in part, on the preliminary analysis in the 2007 SFPUC Water Supply Options report, as noted in Chapter 16.</p>
1166	189	<p>[From ATT8:] The SED states (SED, page 16-70) that, "The Delta diversion facilities would be constructed in areas that are already disturbed by urban development, and most facilities would be located within existing facility footprints and rights-of-way." This statement overlooks the fact that the SFPUC has already developed much of the area identified in the [SFPUC] WSO [Water Supply Options] for other facilities at the Tesla Portal, and thus is inaccurate and misleading.</p>	<p>Please see response to comment 1166-76. As noted in Chapter 16, Evaluation of Other Indirect and Additional Actions, the precise location, size, timing of construction, and details of a delta diversion project cannot be known at this time. There was no assumption in the Chapter 16 analysis for the in-Delta diversion that it would necessarily be located at the Tesla Portal. The in-Delta facility at the Tesla Portal considered in the Water Supply Options report was included in the discussion to serve as an example of an in-Delta diversion project, and to provide a framework for the general discussion of the types of environmental impacts that would result from this type of facility. The actual environmental effects of an in-Delta diversion facility, if one is implemented, would depend on the decisions made by the lead agency. Any potential environmental impacts depend upon the action, and mitigation selected by or required of the entities implementing site-specific projects. CEQA may require a project-level analysis when actions are undertaken or approved.</p>
1166	190	<p>[From ATT8:] The SED states (SED, Appendix L, City and County of San Francisco Analyses, page L-24), "This, or other in-Delta diversions, may be able to divert water that was left in the Tuolumne River as a result of increased instream flows under LSJR Alternatives 2, 3, or 4. The water rights and contractual obligations of SFPUC and other water right holders would need to be determined." Such an option would have all the adverse environmental effects of in-Delta diversions identified above: It would require substantial new infrastructure, including a new intake, pumping plant, large-diameter (60-inch) pipeline, WTP occupying 18 acres, and a blending facility; to treat Delta water the new WTP would contain substantially more hazardous water treatment chemicals than existing disinfection operations at the Tesla Portal; this option would likewise increase energy demand for pumping and water</p>	<p>Please see responses to 1166-76 and 1166-186. Please also see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a discussion of indirect actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. The response also provides information regarding the programmatic level analysis and uncertainties inherent in such an analysis.</p>

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Ltr#	Cmt#	Comment	Response
		<p>treatment; and would face constraints on space for the new facilities at the Tesla Portal. This in-Delta diversion option would also have effects on Delta biological resources and hydrology that have not been evaluated. Such an option would be similar to "WSIP7," one of the 28 alternatives evaluated as part of WSIP planning, except that WSIP7 called for withdrawing SFPUC water that had been left in the Tuolumne River from the lower Tuolumne River, near its confluence with the San Joaquin River, rather than from the Delta. During WSIP planning, WSIP7 was retained for additional analysis in the 2007 WSO report as alternative WS3-2. In addition to environmental impacts, the 2007 WSO report identified the following source water availability and reliability issues associated with alternative WS3-2, which would also apply to this alternative: it would require renegotiation of water rights with the Modesto Irrigation District and Turlock Irrigation District; agreement with all interested parties including resource agencies for releasing water to the lower Tuolumne; and state approval for diverting SFPUC water at the diversion point (in this case, the Delta rather than the lower Tuolumne River); and SFPUC would lose rights to water spilled from the New Don Pedro Water Bank (2007 WSO Report Table 5-2, at 5-8). Thus, while the statement in SED Appendix L that water rights and contractual obligations of the SFPUC and others "would need to be determined" is correct, it understates the uncertainty that would be inherent in such negotiations and the potential for the SFPUC to negotiate the right to recapture from the Delta water that had been left in the Tuolumne River, while retaining SFPUC's ability to use the New Don Pedro water bank, among other concerns. The SED has failed to substantiate its assumption that an in-Delta Diversion option is feasible and to adequately address the environmental impacts that would result from such an option. The SED analysis of environmental impacts associated with the in-Delta Diversion option must be expanded and revised to adequately evaluate the impacts outlined above and identify feasible mitigation measures where appropriate to address significant impacts.</p>	
1166	191	[ATT8:ATT2:ATT3: FERC/DEIS 0259. Draft Environmental Impact Statement for Hydropower Licenses. March 2015.]	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.
1166	192	[ATT8:ATT2:ATT4: Merced Irrigation District's Merced River Hydroelectric Project Relicensing.]	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.
1166	193	[ATT9: CCSF Exhibit 1. Submission to Federal Energy Regulatory Commission by Turlock Irrigation District and Modesto Irrigation District of Settlement Agreement and Request for License Amendments Pursuant to Settlement Agreement, February 5, 1996.]	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.
1166	194	[ATT9:ATT2:ATT5: Scoping Document 1 for La Grange Hydroelectric Project No. 14581. May 23, 2014.]	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.
1166	195	[ATT10: CCSF Exhibit 2. Public Utilities Commission, City and County of San Francisco, Resolution 08-0202 adopting CEQA findings for Water System Improvement Program.]	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.
1166	196	[ATT11: CCSF Exhibit 3. Memo titled "Guidance on Consideration of Economics in the Adoption of Water Quality Objectives," William R. Attwater, Chief Counsel, State Water Resources Control Board, January 4, 1994.]	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.
1166	197	[ATT12: CCSF Exhibit 4. Letter to Mark Gowdy, Division of Water Rights, State Water Resources Control Board, from Jonathan Knapp, Deputy City Attorney, San Francisco City Attorney's Office, July 29, 2014.]	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.



**Table 4-1. Responses to Comments**

Ltr#	Cmt#	Comment	Response
1166	198	<p>[From ATT12:] In a recent letter dated May 6, 2014 to the San Francisco Public Utilities Commission ("SFPUC"), the Division of Water Rights outlined certain "key assumptions" that State Water Resources Control Board ("State Water Board") staff will use in their impact analysis for the revised Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta: San Joaquin River Flows and Southern Delta Water Quality ("Phase 1 SED"), to evaluate impacts to the City and County of San Francisco ("CCSF") that may result from the proposed Tuolumne River flow alternatives. [Footnote 1: Letter from Barbara Evoy, Deputy Director, Division of Water Rights, State Water Resources Control Board, to Ellen Levin, Deputy Manager, Water Enterprise, San Francisco Public Utilities Commission, May 6, 2014 (referred to below as the "May 6, 2014 letter" or "Letter"). The State Water Board also filed the letter in the Federal Energy Regulatory Commission ("FERC") docket for the Don Pedro Hydroelectric Project, FERC No. 2299 ("Don Pedro Project"), on May 12, 2014. The letter is available through the FERC eLibrary under Accession Number 20140513-0028.]The purpose of this letter is to comment on the propriety of staff's reliance on the "key assumptions" identified in the May 6, 2014 letter. [Footnote 2: CCSF reserves the right to argue how the Raker Act or the Fourth Agreement should be interpreted in future proceedings before the State Water Board or other bodies.] The May 6, 2014 letter identifies assumptions by State Water Board staff ("staff") regarding how CCSF will fulfill its obligations under the Raker Act and the Fourth Agreement to the Modesto Irrigation District and the Turlock Irrigation District ("Districts") as a result of new instream flow requirements on the Tuolumne River if the CCSF's storage credits in its Water Bank account in the Don Pedro Project are reduced to zero. In this scenario, staff will assume that economic impacts to CCSF from increased instream flow requirements will be limited to those arising from increased water rates because CCSF will be able to purchase sufficient water from the Districts to avoid water shortages and consequent reductions in water deliveries throughout the Hetch Hetchy Regional Water System ("RWS") service territory.</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC Regional Water System (RWS) service area that could result from implementing the plan amendments presented in the SED, and the types of water supply management strategies that may be undertaken in response to reduced surface water supplies.</p>
1166	199	<p>[From ATT12:] The Phase 1 SED Must Analyze Impacts from Reduced Water Deliveries throughout the Hetch Hetchy Regional Water System as a Result of Implementation of the Proposed Tuolumne River Flow Alternatives Because Reduction in Deliveries is the Reasonably Foreseeable Method of Compliance. The May 6, 2014 letter [Letter from Barbara Evoy, Deputy Director, Division of Water Rights, State Water Resources Control Board, to Ellen Levin, Deputy Manager, Water Enterprise, San Francisco Public Utilities Commission, May 6, 2014 (referred to below as the "May 6, 2014 letter" or "Letter"). The State Water Board also filed the letter in the Federal Energy Regulatory Commission ("FERC") docket for the Don Pedro Hydroelectric Project, FERC No. 2299 ("Don Pedro Project"), on May 12, 2014. The letter is available through the FERC eLibrary under Accession Number 20140513-0028] suggests that the Phase 1 SED may not include analysis of the impacts from reduced water deliveries throughout the RWS service territory that may result from implementation of the proposed Tuolumne River flow alternatives. Such an omission would render staff's California Environmental Quality Act ("CEQA") impact analysis inadequate. The Phase 1 SED must analyze the impacts of reduction in deliveries throughout the RWS service territory that may result from implementation of the proposed Tuolumne River flow alternatives because reduction in deliveries is the only method of compliance that is within the SFPUC's control, and thus, it is the reasonably foreseeable consequence of the State Water Board's contemplated action. The Phase 1 SED must contain "[a]n environmental analysis of the reasonably foreseeable methods of compliance . . . ." [Footnote 3: 23 CCR § 3777 (b)(4) (identifying required elements of Substitute Environmental Documentation ("SED") prepared by the State Water Board, and specifying</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the adequacy of the SED's analysis of the potential water supply reductions to the SFPUC Regional Water System (RWS) service area that could result from implementing the plan amendments presented in the SED, and the types of water supply management strategies that may be undertaken in response to reduced surface water supplies. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced surface water supplies. These actions did not include the severe mandatory rationing described by SFPUC because it was not reasonably foreseeable that a water supplier would impose drastic mandatory water rationing on its customers without first attempting other actions to replace any reductions in water supplies with alternative sources.</p>

Table 4-1. Responses to Comments

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		<p>that "[t]he Draft SED shall include, at a minimum, the following information . . . An environmental analysis of the reasonably foreseeable methods of compliance."].As explained by the California Court of Appeal, under CEQA whether one or more methods of future compliance with a new regulatory requirement are reasonably foreseeable "depends upon the quality and quantity of evidence in the administrative record." [Footnote 4: Cnty. Sanitation Dist. No. 2 of Los Angeles Cnty. v. Cnty. of Kern ("County Sanitation District") (2005) 127 Cal. App. 4th 1544, 1586.] Evidence introduced into the administrative record for the Phase 1 SED by CCSF shows that the foreseeable method of compliance with the proposed Tuolumne River flow alternatives will be reduction in water deliveries throughout the RWS service territory. [Footnote 5: Comment Letter--Bay Delta Plan SED, CCSF, March 29, 2013, available at <a href="http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pd/sed/docs/comments032913/dennis_herrera.pdf">http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/baydelta_pd/sed/docs/comments032913/dennis_herrera.pdf</a> (referred to below as "CCSF Comment Letter"), at pp. 6-7.] More specifically, CCSF submitted comments on the Draft SED for Phase 1 in which it explained that, "SFPUC's analysis of the proposed action [i.e., the preferred alternative which would require 35% of unimpaired flow to remain in the stream] shows there would be dramatic and significant impacts on the SFPUC's diversions from the Hetch Hetchy Project to its Regional Water System service area and the Bay Area economy assuming--as the draft SED recognizes--that revised water release requirements ordered by FERC could result under the Fourth Agreement in a reallocation of water bank credits so as to apportion an additional burden on CCSF of 51.7121%. Assuming current demands and a recurrence of the 1987-1992 drought, the SFPUC's annual diversions from the Tuolumne River could be reduced by 111,700 [acre-feet] for each of the six years of the drought. "This additional annual reduction in supply--when added to reductions in deliveries of up to 20% already imposed by the SFPUC to ensure delivery of water to customers throughout the 1987-1992 drought--results in a single year of reduction in deliveries of 42%, and five years of reduction in deliveries of 52%. In 2009 the SFPUC presented testimony to FERC on the economic impacts of 41% and 51% rationing within the service area of the Regional Water System. . . . The impacts of such levels of rationing on the Bay Area economy are staggering." [Footnote 6: Id. at pp. 6-7 (citing Attachment C to CCSF Comment Letter, CCSF Exposure to SWRCB 35 Percent February-June Flow Requirement, Daniel B. Steiner, Consulting Engineer; Attachment D to CCSF Comment Letter, Answering Testimony of David L. Sunding on Behalf of San Francisco Public Utilities Commission Before the Federal Energy Regulatory Commission (Turlock Irrigation District and Modesto Irrigation District, Project No. 2299 (Don Pedro Project), September 2009)].] Thus, CCSF's predicted method of compliance with the proposed Tuolumne River flow alternatives, i.e., reduction in deliveries throughout the RWS service territory, and the information upon which the prediction is based, e.g., the analyses of CCSF's experts, Mr. Steiner and Professor Sunding, constitute substantial evidence which supports a fair argument that reduction in deliveries to the RWS service territory is a reasonably foreseeable consequence of the SWB's proposed action. [Footnote 7: County Sanitation District, 127 Cal. App. 4th at 1587 (wherein the Court of Appeal concluded that predicted methods of compliance with new regulatory requirements, and the information upon which the predictions are based, "constitute substantial evidence supporting a fair argument" that the predicted methods of compliance are "reasonably foreseeable alternatives" that must be analyzed under CEQA).]Therefore, staff's impact analysis in the Phase 1 SED must consider reduction in deliveries to the RWS service territory and the impacts that would result from such reductions. In particular, staff's analysis must consider direct and indirect physical impacts on the environment from reduction in deliveries to the RWS service territory. (Bakersfield Citizens for Local Control v. City of Bakersfield ("Bakersfield") (2004) 124 Cal. App. 4th 1184, 1205 (explaining, "if the</p>	

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		<p>forecasted economic or social effects of a proposed project directly or indirectly will lead to adverse physical changes in the environment, then CEQA requires disclosure and analysis of these resulting physical impacts.".) A reasonable analysis should evaluate the physical impacts associated with insufficient water supplies and rationing. These types of analyses should be undertaken to provide the decision makers with a full understanding of the environmental consequences of their decision, as required by CEQA.</p>	
1166	200	<p>[From ATT12:] The Phase 1 SED Should Not Analyze CCSF's Purchase of the Required Water from the Districts Because it is Not Reasonably Foreseeable that CCSF and the Districts Would be Able to Effectuate Such a Water Transfer. Under staff's assumption that CCSF would be able to purchase the requisite volume of water from the Districts, the economic impacts to CCSF from increased instream flow requirements will be limited to rate impacts of the additional cost of purchasing such water: "For purposes of the Phase 1 SED analysis . . . staff believes it is reasonable to evaluate CCSF's purchase of the required water from the Districts. The Phase 1 SED, therefore, will evaluate economic impacts by assuming a purchase price for this water from the Districts and then estimate the corresponding increase in water rates in the SFPUC service area and associated indirect and induced impacts in the regional economy. The corresponding fiscal benefit to the Districts of these water sales will also be evaluated." [Footnote 8: [Letter from Barbara Evoy, Deputy Director, Division of Water Rights, State Water Resources Control Board, to Ellen Levin, Deputy Manager, Water Enterprise, San Francisco Public Utilities Commission, May 6, 2014 (referred to below as the "May 6, 2014 letter" or "Letter"). The State Water Board also filed the letter in the Federal Energy Regulatory Commission ("FERC") docket for the Don Pedro Hydroelectric Project, FERC No. 2299 ("Don Pedro Project"), on May 12, 2014. The letter is available through the FERC eLibrary under Accession Number 20140513-0028]</p> <p>It is not reasonably foreseeable that CCSF and the Districts would be able to effectuate such a water transfer for at least three reasons. First, there is no agreement between CCSF and the Modesto Irrigation District (MID) or Turlock Irrigation District (TID) that would enable CCSF to purchase the required volume of water from either of the Districts. The most recent effort to transfer a relatively small amount of water--2 million gallons per day ("MGD")--from MID to CCSF met with significant opposition and the parties were unable to reach agreement. [Footnote 9: See e.g., Holland, "Modesto Irrigation District kills proposed water sale," Modesto Bee (September 18, 2012) available at <a href="http://www.modbee.com/2012/09/18/2378903/modestoirrigation-district-kills.html">http://www.modbee.com/2012/09/18/2378903/modestoirrigation-district-kills.html</a> (explaining that MID voted to cease negotiations with CCSF regarding the proposed 2 MGD water transfer). See also Closed Session Resolution No. 2012-07 Directing Staff and General Counsel to Discontinue Further Negotiations Regarding the Proposed Sale of Water to the City and County of San Francisco, Modesto Irrigation District, September 18, 2012, included hereto as Attachment 1 [ATT12:ATT1].]CCSF also pursued a 2 MGD water transfer with Oakdale Irrigation District ("OID") that would have required a transfer between OID and MID, but the parties were unable to reach agreement to effectuate the transfer, even though the water in question would have come from OID and not MID. [Footnote 10: Stapley, "Modesto Irrigation District blocks Oakdale water sale to SF, for now," The Modesto Bee (January 23, 2014) available at <a href="http://www.modbee.com/2014/01/23/3150103/modestoirrigation-district-not.html">http://www.modbee.com/2014/01/23/3150103/modestoirrigation-district-not.html</a>.]Second, even if such a water transfer could be agreed upon, neither MID nor TID has ever transferred the volume of water that CCSF may be required to contribute under the proposed Tuolumne River flow alternatives. Under the "key assumptions" that the May 6, 2014 letter states staff will use, the preferred alternative analyzed in the Draft SED would</p>	<p>Please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, for a discussion regarding potential responses to water supply reductions, including water transfers. In addition, please see Master Response 8.5, Assessment of Potential Effects on the San Francisco Bay Area Regional Water System, regarding the State Water Board's evaluation of potential reductions in water supply to the SFPUC RWS service area during consecutive drought years with implementation of the plan amendments. As described in Master Response 8.5, the SED identified reasonably foreseeable actions that could be taken by affected entities to comply with the plan amendments and in response to reduced water supplies.</p>

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		<p>require purchase of 111,700 acre-feet ("AF") for each of the six years of the drought. On average, 85 percent of RWS supplies come from the Tuolumne River watershed. At recent delivery rates this amounts to approximately 222,510 AF/year. Thus, to replace the forecasted shortage amount of 111,700 AF/year, CCSF would need to obtain more than half of the water that it currently diverts from the Tuolumne River for each of six consecutive drought years. Neither MID nor TID has ever transferred that much water to any other entity, and thus, it is not reasonably foreseeable that they would do so during a severe and prolonged drought. Indeed, it is unclear whether the requisite volume of water--over 100,000 AF--would be available for transfer by the Districts in any water year type, let alone a dry or critically dry year. Third, staff's proposed impact analysis will be based on an assumed purchase price for water to be sold by the Districts to CCSF, without any reasonable basis for determining such a price. Since the hypothetical water transfer proposed by staff is neither based on any existing agreement, nor remotely comparable in scale to any completed or contemplated water transfer by either of the Districts, a purchase price for that water cannot be predicted with any reasonable assurance of accuracy. Staff nevertheless appears to envision that this speculative, assumed purchase price will be the basis for its evaluation of impacts to CCSF from the proposed Tuolumne River flow alternatives, i.e., impacts that would result from rate increases to account for the additional costs borne by CCSF to purchase the required water. Staff's assumption that it will be feasible for CCSF to purchase the required volume of water from the Districts at staff's assumed purchase price must be supported by substantial evidence in the administrative record. (Bakersfield, 124 Cal. App. 4th at 1198 (explaining, "[t]he substantial evidence standard is applied to conclusions, findings and determinations.") Argument, speculation, unsubstantiated opinion or narrative, and evidence which is clearly inaccurate or erroneous is not substantial evidence. (Cal. Pub. Res. Code § 21082.2(c); 14 CCR § 15384(a).) In the May 16, 2014 letter, staff indicates, but fails to identify, the bases for its assumptions. If staff is unable to support its assumptions regarding the feasibility of CCSF purchasing the requisite volume of water from the Districts at staff's assumed purchase price with substantial evidence, then the State Water Board will be unable to rely upon any analysis based on such assumptions in the Phase 1 SED.</p>	
1166	201	[ATT12:ATT1: Closed Session Resolution No. 2012-07 Directing Staff and General Counsel to Discontinue Further Negotiations Regarding the Proposed Sale of Water to the City and County of San Francisco.]	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.
1166	202	[ATT13: CCSF Exhibit 5. Bay-Delta Phase 1 Staff Technical Workshop of December 12, 2016, Transcript of Video Recording.]	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.
1166	203	[ATT14: CCSF Exhibit 6. Fact Sheet, November 2016 Statewide Conservation Date, State Water Resources Control Board website.]	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.
1166	204	[ATT15: CCSF Exhibit 7. Affidavit of Anson B. Moran ("Moran Affidavit"), FERC Project No. 2299, January 26, 1994.]	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.
1166	205	[ATT16: CCSF Exhibit 8. Budget Workshop Presentation, Board Meeting, Alameda County Water District, May 26, 2016.]	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.
1166	206	[ATT17: CCSF Exhibit 9. "Millbrae Residents Learn About Risks of 60 Year Water System," Public, January 30, 2017.]	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.

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1166	207	[ATT18: CCSF Exhibit 10. Moody's Investor Service, Credit Opinion, September 27, 2016, San Francisco Public Utilities Commission, Water Enterprise, New Issue--Moody's assigns Aa3 to San Francisco Public Utilities Commission (CA) Water Revenue Bonds Rating Report for SFPUC Bond.]	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.
1166	208	[ATT19: CCSF Exhibit 11. U.S. Environmental Protection Agency, Reducing Urban Heat islands: Compendium of Strategies, October 2008.]	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.
1166	209	[ATT20: CCSF Exhibit 12. U.S. Environmental Protection Agency web page entitled "What is Green Infrastructure?"]	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.
1166	210	[ATT21: CCSF Exhibit 13. At Risk: the Bay Area Greenbelt, 2017, Greenbelt Alliance.]	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.
1166	211	[ATT22: Exhibit 14. Baumann, Adrian, "State Water Board Issues Moratorium on New Water Connections," Daily Democrat, November 5, 2014.]	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.
1166	212	[ATT23: CCSF Exhibit 15. City of East Palo Alto Agenda, City Council Regular Meeting, July 19, 2016, City Council Agenda Report, P&A Item No. 10D, Approving an Ordinance Prohibiting New or Expanded Water Connections to the City of East Palo Alto Water System.]	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.
1166	213	[ATT24: CCSF Exhibit 16. Landgraf, K., "East Palo Alto imposes development moratorium due to lack of water," Mercury News, July 20, 2016.]	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.
1166	214	[ATT25: CCSF Exhibit 17. Plan Bay Area: A Strategy for a Sustainable Region, July 18, 2013, Association of Bay Area Governments, Metropolitan Transportation Commission.]	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.
1166	215	[ATT26: CCSF Exhibit 18. Memo to Joint MTC Planning Committee with the ABAG Administrative Committee to MTC Deputy Executive Director, Policy/ABAG Executive Director regarding Plan Bay Area 2040 Draft Preferred Land Use Scenario, September 2, 2016.]	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.
1166	216	[ATT27: CCSF Exhibit 19. Summary of California Air Resources Board Select 8 Summary, accessed March 9, 2017.]	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.
1166	217	[ATT28: CCSF Exhibit 20. Agreement Relating to the Transfer of Water, December 20, 1990.]	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.
1166	218	[ATT29: CCSF Exhibit 21. Brekke, Dan, "As California Drought Deepens, Those With Water Can Sell at a High Price," KQED, July 2, 2014.]	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.
1166	219	[ATT30: CCSF Exhibit 22. Placer County Water Agency, Board of Directors, Regular Meeting, Minutes, July 21, 2016.]	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.
1166	220	[ATT31: Exhibit 23. Placer County Water Agency, Board of Directors, Regular Meeting, Minutes, June 18, 2009.]	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.
1166	221	[ATT32: Exhibit 24. Letter from Roger VanHoy, General Manager, Modesto Irrigation District and Casey Hashimoto, General Manager, Turlock Irrigation District, to Mark Gowdy, State Water Resources Control Board, dated August 6, 2014.]	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.

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1166	222	[ATT33: Exhibit 25. Holland, John, "Modesto Irrigation District kills proposed water sale," Modesto Bee (September 18, 2012).]	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.
1166	223	[ATT34: Exhibit 26. Stapley, "Modesto Irrigation District blocks Oakdale water sale to SF, for now," The Modesto Bee, January 23, 2014.]	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.
1166	224	[ATT35: Exhibit 27. Stapley, "OID reveals big-money water sale to outside buyers," The Modesto Bee, October 13, 2015.]	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.
1166	225	[ATT36: Exhibit 28. Carlson, Ken, "Stanislaus County Supervisors to Vote on Water Export Rules, Modesto Bee," September 9, 2013.]	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.
1166	226	[ATT37: Exhibit 29. City of Carlsbad California website, FAQs, Carlsbad Desalination.]	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.
1166	227	[ATT38: Exhibit 30. City of Carlsbad California website, Agua Hedionda Lagoon.]	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.
1166	228	[ATT39: Exhibit 31. Gorn, David, "Desalination's Future in California Is Clouded by Cost and Controversy," KQED Science, October 31, 2016.]	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.
1166	229	[ATT40: CCSF Exhibit 32. Fikes, Bradley J., "State's biggest desal plant to open: What it means," San Diego Union-Tribune, December 13, 2015.]	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.
1166	230	[ATT41: CCSF Exhibit 33. Bay-Delta Phase 1 Staff Technical Workshop of December 5, 2016, Transcript of Video Recording.]	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.