13. Introduction to Responses and WSIP Revisions

CHAPTER 13
Introduction to Responses and WSIP Revisions

13.1 Overview of Responses to Comments

Organization

This is Volume 7 of the Program Environmental Impact Report (PEIR) on the San Francisco Public Utilities Commission's (SFPUC) Water System Improvement Program (WSIP or proposed program) and presents the responses to comments received on the Draft PEIR. Copies of the comments are contained in Volume 6, and appendices to the Comments and Responses are contained in Volume 8; together, Volumes 6, 7, and 8 make up the Comments and Responses document. The Draft PEIR, published on June 29, 2007, consists of Volumes 1 through 5, and when combined with the Comments and Responses document (Volumes 6, 7, and 8), constitutes the Final PEIR on the WSIP.

The Comments and Responses document is separated into three volumes. Volume 6, Comments, consists of two chapters. Chapter 11 in Volume 6 is an introductory chapter that describes the purpose of the Final PEIR as well as the organization and coding of the comments; it includes a list of all agencies, organizations, and individuals that submitted comments on the Draft PEIR and describes the coding system used to identify individual comments. Chapter 12 contains copies of all comments received on the Draft PEIR and identifies each comment by alphanumeric code.

Volume 7, Responses, consists of Chapters 13 through 16. This chapter, Chapter 13, describes the organization of the responses to the comments received on the Draft PEIR and also describes changes in the WSIP that have been proposed by the SFPUC since publication of the Draft PEIR. The SFPUC has proposed revisions to the WSIP in three areas, either in response to comments received on the Draft PEIR or as part of its ongoing system operations and planning. These revisions include: (1) changes in the project descriptions of two WSIP facility improvement projects (both of which help reduce impacts associated with the projects as originally proposed) which affect overall system operations; (2) updated water system assumptions and corresponding updates in the system modeling and results; and (3) development of the Phased WSIP Variant, a "hybrid" program that is a combination of the proposed program and one of the alternatives analyzed in the Draft PEIR. As described below, none of these changes to the WSIP affect the impact conclusions presented in the Draft PEIR; they do not result in new or more severe environmental impacts than those previously disclosed in the Draft PEIR.

Chapter 14 contains master responses, which provide comprehensive discussions to respond to select sets of issues that received multiple comments, and it includes cross-references to the individual comments being addressed using the alphanumeric codes shown in Volume 6, Chapter 12. Chapter 15 presents the individual responses directed specifically to each comment; in some cases, the reader is referred to a master response in Chapter 14 or to another individual response that addresses the same issue. Chapter 16 contains text changes to the Draft PEIR that resulted from: (1) changes made in response to comments received on the Draft PEIR; (2) changes that reflect the WSIP revisions; or (3) changes to correct errors or to clarify information presented in the Draft PEIR. Volume 8, Appendices, provides supporting documentation for information presented in the Comments and Responses document.

Responses

As required by Section 15132 of the Guidelines for the California Environmental Quality Act (CEQA Guidelines), the responses in this volume address significant environmental issues raised by commenters during the review period. They are intended to provide clarification and refinement of information presented in the Draft PEIR and, in some cases, to correct or update information in the Draft PEIR. In some instances, the text of the Draft PEIR has been revised in response to a comment, and the revised text is included as part of the response. The reader is referred to Volume 6, Chapter 11, Tables 11.2 through 11.7, for a complete list of commenters and the alphanumeric comment identification codes.

Due to the repetitiveness of many issues raised by commenters, Chapter 14 includes master responses that provide a more comprehensive discussion of related issues. Chapter 15 includes responses to every individual comment, although sometimes a response refers the reader to either a master response or another response. The responses to the individual comment letters in Chapter 15 are organized by commenter type (federal, state, or local/regional agency; special interest group; or citizen) and referenced by the alphanumeric code corresponding to the comment. Responses to oral comments received during public hearings (see Section 12.6, Public Hearing Transcripts, in Vol. 6, Chapter 12) are integrated with the responses to written comments and are included in Chapter 15 by commenter type.

Many comments received on the Draft PEIR did not address the adequacy or accuracy of the environmental analysis or did not identify any other significant environmental issue requiring a response; rather, these comments were directed toward the perceived merits or demerits of the proposed WSIP, provided information, or expressed an opinion without specifying why the Draft PEIR analysis was inadequate. The San Francisco Planning Department, as the CEQA lead agency, acknowledges the receipt of these types of comments; however, limited responses are provided to these comments as they do not relate to the adequacy or accuracy of the Draft PEIR or otherwise raise significant environmental issues.

Where a response to a comment includes a change to the text of the Draft PEIR, the text changes are shown in <u>underline</u> for additions and ~~strikethrough~~ for deletions.

Some issues received a substantial number of comments from numerous commenters, demonstrating common concerns among agencies, special interest groups, and members of the public. For these issues, a comprehensive discussion of the issue and related topics is presented as a master response in Chapter 14 of this document. Each master response provides an integrated and comprehensive response to a particular issue and related concerns. The master responses are listed below:

14.1 Master Response on WSIP Purpose and Need
14.2 Master Response on Demand Projections, Conservation, and Recycling
14.3 Master Response on Proposed Dry-Year Water Transfer
14.4 Master Response on PEIR Appropriate Level of Analysis
14.5 Master Response on Water Resources Modeling
14.6 Master Response on Upper Tuolumne River Issues
14.7 Master Response on Lower Tuolumne River Issues
14.8 Master Response on Delta and San Joaquin River Issues
14.9 Master Response on Alameda Creek Fishery Issues
14.10 Master Response on Modified WSIP Alternative
14.11 Master Response on Climate Change

13.2 Program Description Changes Affecting System Operations

Since publication of the Draft PEIR in June 2007, the SFPUC has modified the project descriptions of two of the facility improvement projects—the Alameda Creek Fishery Enhancement (SV-1) and Calaveras Dam Replacement (SV-2) projects—and these proposed changes would affect overall system operations (SFPUC, 2008a). These modifications were made due to the numerous comments received on the potential impacts on future steelhead fishery resources in the Alameda Creek watershed as well as to actions taken in July 2007 by other agencies in the watershed. The SFPUC has incorporated project revisions and protective measures into these two projects to reduce the WSIP's potential to affect habitat conditions for potential future-occurring steelhead in the upper watershed. The project revisions would occur regardless of steelhead presence or absence in the upper watershed, while the protective measures were designed to reduce the WSIP's potential to affect habitat conditions for potential, future-occurring steelhead in the Alameda Creek watershed in the event that man-made barriers in Alameda Creek are removed and steelhead gain access to the upper watershed.

The proposed project revisions and protective measures would provide both a long-term strategy to ensure habitat protection as well as interim measures in the event that regulatory agencies have determined steelhead to be present above the BART weir, construction of the Calaveras Dam Replacement project is complete, and the Alameda Watershed Habitat Conservation Plan is yet to be finalized. Please refer to **Section 14.9, Master Response on Alameda Creek Fishery Issues** (Vol. 7, Chapter 14) for further description of the project revisions and protective measures.

In summary, the following project revisions have been incorporated into the Alameda Creek Fishery Enhancement (SV-1) and Calaveras Dam Replacement (SV-2) projects:

- The Calaveras Dam Replacement project would include facility modifications at the Alameda Creek Diversion Dam (ACDD) to construct a new bypass structure needed to implement bypass stream flows.

- If a structural alternative involving construction of a recapture facility is selected under the Alameda Creek Fishery Enhancement project, the recapture facility would be located at the downstream end of the reach of Alameda Creek between the lower Sunol Valley and the confluence with Arroyo de la Laguna. As an alternative to the recapture facility, the SFPUC may coordinate with other water agencies to develop and implement other means of recapturing fishery enhancement flows consistent with the 1997 California Department of Fish and Game Memorandum of Understanding (CDFG MOU).[1]

The project components designed to provide protective measures for future-occurring steelhead in the upper Alameda Creek watershed would include the following:

- An operational plan to provide minimum stream flows to support steelhead spawning below the ACDD to the confluence with Calaveras Creek when precipitation naturally generates runoff and flow in the creek, including the site-specific studies needed to determine the specific minimum stream flow requirements to support steelhead spawning in this reach of the creek.

- A detailed monitoring plan to survey and document steelhead spawning, subject to review and comment by the appropriate resource agencies.

- Interim minimum flows would be implemented consistent with the 1997 CDFG MOU, with the additional requirement that these flows would be achieved through bypass flows at the ACDD at all times when flows are available in upper Alameda Creek, rather than through releases at Calaveras Dam, and with the following conditions:

  – The SFPUC would provide seasonal flow bypasses at the ACDD and/or flow releases from Calaveras Dam, either (1) without recapture or (2) with recapture at a point approximately at the downstream end of the reach of Alameda Creek between the lower Sunol Valley and the confluence with Arroyo de la Laguna, below critical riffle locations or lower in the creek, between December 1 and June 30 (combined adult and juvenile migration period) in an amount equivalent to the flow release schedule provided in the 1997 CDFG MOU.

  – As an alternative to the recapture facility, the SFPUC would coordinate with other water agencies to develop and implement other means of recapturing enhancement flows consistent with the 1997 CDFG MOU at a location downstream of the reach of Alameda Creek between the lower Sunol Valley and the confluence with Arroyo de la Laguna.

[1] Under the 1997 CDFG MOU, the SFPUC and CDFG reached agreement on the magnitude and timing of flows to be released from Calaveras Reservoir for the purposes of improving fishery habitat conditions. The MOU includes provisions for the SFPUC to divert flows from Alameda Creek to the SFPUC regional system at a suitable downstream location equivalent to the magnitude and timing of these releases; the MOU refers to this as "recapture."

In Draft PEIR Tables S.2 and 3.10 (Vol. 1, Summary, p. S-12, and Chapter 3, p. 3-50), the following text related to the location and description of these two facility improvement projects is revised to incorporate information about these recently initiated planning efforts:

No.	Project Title	Location of Preferred Project	Project Description
SV-1	Alameda Creek Fishery Enhancement	Structural Alternatives: Alameda Creek in Sunol Valley, downstream of Calaveras Dam	This project would recapture the water released as part of the Calaveras Dam project (SV-2) and return it back to the regional system for use. A number of structural and non-structural recovery alternatives are under consideration for this project, including: a water recapture facility downstream of the Sunol Valley WTP, conjunctive groundwater use, horizontal collector wells, or other groundwater recovery systems yet to be defined. Other alternative designs for this project could be developed. If a structural alternative involving construction of a recapture facility is selected, the recapture facility would be located at the downstream end of the reach of Alameda Creek between the lower Sunol Valley and the confluence with Arroyo de la Laguna. As an alternative to the recapture facility, the SFPUC may coordinate with other water agencies to develop and implement other means of recapturing fishery enhancement flows consistent with the 1997 CDFG MOU.
SV-2	Calaveras Dam Replacement	Sunol Valley, immediately downstream of existing dam and at the Alameda Creek Diversion Dam	This project would provide for the planning, design, and construction of a replacement dam at Calaveras Reservoir to meet seismic safety requirements. The new dam would provide for a reservoir with the same storage capacity as the original reservoir (96,800 acre-feet), but the replacement dam would be designed to accommodate enlargement of the dam in the future. The preferred project would include construction of: • New earthfill dam • New intake tower and new outlet valve for water releases for instream flow requirements • New or rehabilitated outlet works for seismic safety and improved operations and maintenance • New bypass structure at the Alameda Creek Diversion Dam As part of this project, Calaveras Reservoir and the proposed bypass structure at the diversion dam would be operated to release up to 6,300 acre-feet per year (5.5 mgd) of water to Alameda Creek in support of fisheries in compliance with the 1997 CDFG MOU. When flow is available in Alameda Creek, releases would be made through the proposed bypass structure at the Alameda Creek Diversion Dam and would be supplemented as necessary with releases from Calaveras Dam.

These project description modifications would generally reduce the impacts identified in the Draft PEIR, and, in some cases, would reduce impacts from potentially significant to less than significant (i.e., Impacts 5.4.7-1 and 5.4.7-2). The refined impact analyses associated with these project description modifications, including the discussions on Impacts 5.4.7-1 and 5.4.7-2, are presented in Chapter 16, Staff-Initiated Text Changes (Vol. 7).

13.3 Updated Water System Assumptions and Modeling

As described in the Draft PEIR (Vol. 3, Chapter 5, p. 5.1-9), the SFPUC utilizes a computerized water supply planning model to assist in the evaluation of its water systems operations—the Hetch Hetchy/Local Simulation Model (HH/LSM). Data from the HH/LSM were used in the Draft PEIR to evaluate the impacts of WSIP water supply and system operations on resources in the Tuolumne River, Alameda Creek, and Peninsula watersheds (Vol. 3, Chapter 5). In 2008, subsequent to publication of the Draft PEIR, the SFPUC conducted updated model runs using more recent input assumptions for several model parameters as part of its ongoing system planning and management. The revised input assumptions included the following:

- Adjusted capacity for Crystal Springs Reservoir based on recent survey data
- More accurate assumptions for Pilarcitos facilities operations
- Improved data regarding the historical hydrology in the Alameda Creek watershed
- Updated agricultural demands in the service areas of the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) to be consistent with data used in recent statewide planning documents
- Refinement in the water release protocols at Don Pedro Reservoir

Review of the 2008 model output indicated that the results are generally consistent with the 2007 results used in the Draft PEIR impact analyses of water supply and system operations, and that the analyses and impact determinations presented in the Draft PEIR remain valid. With one exception, no changes in the Draft PEIR impact approach, analysis, or conclusions are necessary for the water supply and system operations impact assessments. The sole exception is the approach to the analysis of impacts on Pilarcitos watershed resources, for which only semi-quantitative data were previously available. Therefore, the 2008 data were used to conduct a refined impact analysis of the Pilarcitos watershed resources; no new impacts were identified in the refined analysis. The results of the refined impact analysis for the Pilarcitos watershed are summarized below, and the complete refined impact analysis is presented in Chapter 16, Staff-Initiated Text Changes.

In select instances, the Draft PEIR text and tables presenting the 2007 results have been updated with the 2008 results where useful to reflect this more current information; it should be noted that there are no changes in any of the impact analyses or conclusions as a result of the revised model data. In addition, review of the 2008 HH/LSM data provided additional insight in understanding the potential range and magnitude of impacts, and some revisions to the Draft PEIR text based on the updated HH/LSM modeling are included in Chapter 16, Staff-Initiated Text Changes, to provide refinement and clarification of the impact discussions. However, no staff-initiated text changes are provided in Chapter 16 to replace 2007 results with the updated 2008 results if the impact approach, analysis or conclusions are unaffected by the updated modeling.

One of the notable outcomes of the updated HH/LSM output is a refinement in the estimated magnitude of dry-year water transfers that would be required under the WSIP. The 2007 model results used in the Draft PEIR indicated that an equivalent of 23 million gallons per day (mgd) (annual average over the 8.5-year design drought) of supplemental Tuolumne River water obtained through water transfer agreements with TID and MID would be required to meet the WSIP level of service objectives (see Vol. 1, Chapter 3, p. 3-36). The updated 2008 analysis indicates that this number would be 26 mgd. Please refer to **Section 14.3, Master Response on Proposed Dry-Year Water Transfer** (Vol. 7, Chapter 14) for further explanation of this updated information.

Refined Pilarcitos Watershed Impact Analysis

The refined impact analysis for the Pilarcitos Creek watershed involved updated modeling using the HH/LSM as well as biological field reconnaissance. The refined analysis enabled a more precise identification of the potential impacts of the WSIP in that watershed. No new impacts were identified that were not documented in the Draft PEIR, but several impacts identified as potentially significant in the Draft PEIR were reevaluated and determined to be less than significant. Analysts were able to reclassify terrestrial biological and fishery impacts at Pilarcitos Reservoir and terrestrial biological impacts at Pilarcitos Creek between the reservoir and Stone Dam as less than significant. The revised impacts are reflected in Chapter 16, Staff-Initiated Text Changes.

In the Draft PEIR, a mitigation measure was proposed that would lessen or eliminate all potentially significant adverse impacts of the WSIP in the Pilarcitos Creek watershed (Measure 5.5.3-2, Revised Operations Plan for Pilarcitos Watershed Facilities). Under the revised operations plan identified in this measure and with the WSIP in place, the SFPUC would develop protocols that would enable it to operate its Pilarcitos Creek watershed facilities just as it does under the existing conditions. Future operations would mimic existing operations as closely as possible and, consequently, there would be little or no change in environment impacts. However, an attempt to develop the protocols led to the conclusion that the revised operations plan envisaged under Measure 5.5.3-2 would be technically challenging and that other more practical solutions are available.

More practical mitigation measures to replace Measure 5.5.3-2 were developed subsequent to publication of the Draft PEIR and are included in Volume 7, Chapter 16. The replacement mitigation measures would reduce the potential impacts of the WSIP in the Pilarcitos Creek watershed to a less-than-significant level. They include:

- Measure 5.5.3-2a, Low-Head Pumping Station at Pilarcitos Reservoir, which would lessen fishery and water quality impacts in Pilarcitos Creek between Pilarcitos Reservoir and Stone Dam

- Measure 5.5.5-5, Establish Flow Criteria, Monitor and Augment Flow, which would lessen fishery impacts in Pilarcitos Creek below Stone Dam

Because Measure 5.5.3-2a could itself result in potentially significant water quality, fisheries, and terrestrial biological impacts at Pilarcitos Reservoir, two additional measures were developed to mitigate these impacts. The potential water quality and fisheries impacts in Pilarcitos Reservoir would be reduced to a less-than-significant level through implementation of Measure 5.5.3-2b, Aeration System at Pilarcitos Reservoir; this measure also addresses potentially significant impacts on fisheries in Pilarcitos Creek below the reservoir. The potential terrestrial biological impacts at Pilarcitos Reservoir due to Measure 5.5.3-2a would be reduced to a less-than-significant level through implementation of Measure 5.5.3-2c, Habitat Monitoring and Compensation.

13.4 Phased WSIP Variant

Introduction

In March 2008, the SFPUC determined that it would like the option to consider approval and implementation of a variation of the WSIP called the Phased WSIP Variant (SFPUC, 2008b; SFPUC, 2008c). The SFPUC identified this variation in order to consider a program scenario that would involve *full implementation of the proposed WSIP facility improvement projects* to ensure that the public health, water quality, seismic safety, and delivery reliability goals are achieved as soon as possible, but a *phased implementation of water supply delivery through 2030*. Phasing the water supply element of the WSIP would allow the SFPUC and its wholesale customers to focus first on implementing additional local recycled water, groundwater, and demand management actions while minimizing additional diversions from the Tuolumne River. Under this variant, the SFPUC would establish an interim, mid-term planning horizon—the year 2018. If the SFPUC adopts this variant, it would make a decision about future water supply to its customers through 2018 *only* and defer a decision regarding long-term water supply until after 2018. All WSIP goals and level of service objectives that are not related to 2030 water supply levels would be achieved under this variant, and all individual WSIP facility improvement projects proposed by the SFPUC would be constructed.

Under this variant, the SFPUC would limit average annual water deliveries supplied from its watersheds to 265 mgd. This generally represents the base-year level of supply delivered from the SFPUC watersheds through the regional water system to both the retail and wholesale customers analyzed in the Draft PEIR.[2] The SFPUC would maintain the 265 mgd average annual delivery of surface water from the SFPUC watersheds to existing levels through 2018. At the same, through 2018, the SFPUC would implement the delivery and drought reliability element of the WSIP, including proposed dry-year transfers from MID/TID coupled with the Westside Basin conjunctive use program, which would increase average annual diversions from the Tuolumne River by about 2 mgd over the existing conditions.

[2] The SFPUC watersheds that supply surface water to the regional system include the local watersheds—the Alameda Creek and Peninsula watersheds—and the Tuolumne River watershed. Under this variant, similar to existing conditions, the Tuolumne River watershed would provide approximately 85 percent and the local watersheds would provide approximately 15 percent of the water supply delivered to customers.

By 2018, the demand on the SFPUC regional water system is projected to be 285 mgd, consisting of 91 mgd for the retail customers and 194 mgd for the wholesale customers, based on the purchase requests developed by the wholesale customers as part of the WSIP planning process. To satisfy the remaining 20 mgd of demand on the regional system through 2018 while holding deliveries from the SFPUC watersheds to 265 mgd, the SFPUC proposes development of local conservation, recycled water, and groundwater projects within its service area. As proposed under the WSIP, the Phased WSIP Variant would develop 10 mgd of local supply and supply offsets through conservation, recycled water and groundwater projects in San Francisco. The SFPUC also proposes to develop an additional 10 mgd of local conservation, recycled water, and groundwater within the service area under this variant through one of the following three approaches:

- The SFPUC, wholesale customers, and Bay Area Water Supply and Conservation Agency (BAWSCA) partner to develop an additional 10 mgd in local conservation, recycled water, and groundwater within the service area; or

- BAWSCA and the wholesale customers develop an additional 10 mgd in local conservation, recycled water, and groundwater within the wholesale customer service area, independent of the SFPUC; or

- Individual wholesale customers develop 10 mgd of additional conservation, recycled water, and groundwater on their own within their individual services areas.

The SFPUC has initiated discussions with BAWSCA and the wholesale customers to determine the best approach to develop the additional 10 mgd of local supply/conservation needed under this WSIP variant to fully meet the wholesale customer needs through 2018.

By 2018, the SFPUC would reevaluate the wholesale customer delivery amount and consider whether to maintain these delivery limitations from the SFPUC watersheds through 2030 or increase them, and whether and how to provide additional supply to the wholesale customers. In the years approaching 2018, the SFPUC would update demand projections for its wholesale and retail customers and reevaluate customer water delivery needs and water supply options. As part of the process, the City and County of San Francisco (CCSF) would conduct additional environmental studies and CEQA review as appropriate to address the SFPUC's recommendation regarding water supply and proposed water system deliveries after 2018.

The following subsections describe the Phased WSIP Variant in more detail and summarize the environmental impacts associated with this variant based on the analysis in the PEIR. In summary, this variant includes the following key program elements:

- Full implementation of WSIP facility improvement projects.

- Water supply delivery to wholesale and retail regional system customers through 2018 of at least 275 mgd average annual target delivery, and up to an additional 10 mgd of conservation, recycled water, and groundwater developed in one of the three approaches described above. This includes 91 mgd for the retail customers and 184–194 mgd for the wholesale customers.

- Water supply sources include: 265 mgd average annual delivery from the SFPUC watersheds (i.e., the Tuolumne River watershed and the local watersheds), 10 mgd of conservation, water reuse, and groundwater developed by the SFPUC within San Francisco but used to meet regional system delivery needs, and up to an additional 10 mgd of conservation, water reuse, and groundwater developed in one of the three approaches described above.

- Dry-year water transfer from MID/TID of about 2 mgd coupled with the Westside Groundwater Basin conjunctive-use project to meet the drought-year goal of limiting rationing to no more than 20 percent on a systemwide basis.

- Reevaluation of 2030 demand projections, potential regional system demand (purchase requests), and water supply options by 2018, and SFPUC decision in 2018 regarding regional water system deliveries after 2018.

As further described below, the potential environmental effects of the Phased WSIP Variant fall within the range of impacts already evaluated in the Draft PEIR for the WSIP and the alternatives. This program variation is similar to the No Purchase Request Increase Alternative analyzed in the Draft PEIR. That alternative also limits average annual regional water system deliveries from the SFPUC watersheds to approximately 265 mgd, but it does so through 2030, while the Phased WSIP Variant only establishes this limit through 2018. Although the Phased WSIP Variant does not include a specific water supply proposal beyond 2018, for purposes of environmental impact analysis and comparison to the proposed WSIP and other alternatives evaluated in the PEIR, the following discussion assesses the range of water supply that could be provided under this variant through 2030. On the low end of the range, after 2018 and through 2030 under the Phased WSIP Variant, deliveries from the SFPUC watersheds could continue to be limited to 265 mgd, similar to the No Purchase Request Increase Alternative. On the high end of the range, after 2018 and through 2030, the SFPUC could propose to increase surface water deliveries from the watersheds and meet the additional projected 2030 demands of up to 15 mgd on the regional water system for a total demand of 300 mgd, which could include average annual deliveries from the SPFUC watersheds of up to 280 mgd coupled with up to 20 mgd of local conservation, recycled water, and groundwater previously implemented in the first phase by 2018. This would provide the retail customers with 91 mgd and the wholesale customers with 209 mgd in average annual deliveries. This high-end scenario would be similar to the Modified WSIP Alternative, which assumes 10 mgd of conservation, recycled water, and groundwater in San Francisco and 10 mgd of conservation, recycled water, and groundwater in the wholesale service area.

The No Purchase Request Increase Alternative is discussed in Draft PEIR Section 9.2.3 (Vol. 4, Chapter 9, pp. 9-40 to 9-47) and Section 9.3 (pp. 9-84 to 9-96). Also relevant are the analyses of the No Program Alternative (Section 9.2.2, pp. 9-23 to 9-40), the Aggressive Conservation/Water Recycling and Local Groundwater Alternative (Section 9.2.4, pp. 9-47 to 9-59), and the Modified WSIP Alternative (Vol. 4, Chapter 9, Section 9.2.8, pp. 9-78 to 9-84; and Vol. 7, Chapter 14, Section 14.10, Master Response on Modified WSIP Alternative).

Description of SFPUC and Wholesale Customer Actions

SFPUC Actions

Water Delivery

Table 13.1 summarizes the SFPUC average annual water deliveries to its retail and wholesale customers under the WSIP, the No Purchase Request Increase Alternative, and the Phased WSIP Variant. Under the Phased WSIP Variant, the SFPUC proposes to establish an interim delivery amount through the year 2018, and then to either maintain this same delivery amount through 2030 or increase it, possibly up to the level proposed under the WSIP.

TABLE 13.1
SFPUC AVERAGE ANNUAL WATER DELIVERIES UNDER THE PHASED WSIP VARIANT

Supply Source	SFPUC Regional System Average Annual Water Deliveries (mgd)		
	Existing Condition 2005	WSIP (Proposed Program) 2030	Phased WSIP Variant 2018
SFPUC Watersheds			
Retail customers[a]	91	81	81
Wholesale customers	174	209	184
Total	**265**	**290**	**265**
Local Conservation, Recycled Water, and Groundwater (not included in purchase requests)			
Retail customers	0	10	10
Wholesale customers	0	0	0 – 10 [b]
Total	**0**	**10**	**10 – 20**
Total from all sources	**265**	**300**	**275 – 285**

a The SFPUC retail customer deliveries include 1 mgd delivered to Castlewood in the Pleasanton area that is supplied by local groundwater rather than from the regional system. Thus, although this delivery amount is included in the SFPUC retail customer delivery total, 90 mgd represents the current and future deliveries to retail customers that are and will continue to be made from the regional system.

b A range is provided because 10 mgd may be provided by SFPUC in partnership with BAWSCA and wholesale customers or BAWSCA and wholesale customers may choose to separately develop this 10 mgd.

The 2030 regional system water deliveries shown in Table 13.1 for the WSIP reflect wholesale customer purchase requests of 209 mgd (see the Draft PEIR, Vol. 1, Chapter 3, pp. 3-16 to 3-22 for a discussion of the wholesale customer purchase requests developed for the WSIP). Under the WSIP, the 2030 combined retail and wholesale customer purchase requests of 300 mgd would be met with up to 290 mgd of supply from the SFPUC watersheds and 10 mgd from local conservation, recycled water, and groundwater projects developed in San Francisco and used to meet the overall regional system needs. Under the Phased WSIP Variant, the regional system target delivery for the wholesale customers in 2018 would range from 184 mgd to 194 mgd, depending on how BAWSCA and wholesale customers elected to develop the required additional

10 mgd of local conservation, recycled water, and groundwater needed. If the SFPUC and BAWSCA partnered to jointly develop the additional 10 mgd of local supply and conservation and made it part of the regional system supply portfolio, then the wholesale customer delivery target for the regional water system would be 194 mgd to match their purchase requests. If BAWSCA and/or the wholesale customers decided to develop the additional 10 mgd of conservation, recycled water, and groundwater independent of the SFPUC and not make it part of the regional system supply portfolio, then the wholesale customer delivery target from the regional system would be 184 mgd.

Although the SFPUC would only make a decision regarding water supply through 2018 under the Phased WSIP Variant, after 2018 and through 2030 it is possible that average annual deliveries to the wholesale customers could range from 184 mgd to 209 mgd, as shown in Table 13.1 (or 199 mgd, on the high end if it is an assumed additional 10 mgd of local conservation, recycled water and groundwater programs is implemented by 2018). If after 2018 the SFPUC decides to maintain the 184 mgd average annual limit on SFPUC watershed deliveries to the wholesale customers, then by 2030 the SFPUC regional water system deliveries to the wholesale customers could be up to 25 mgd less than their 209 mgd purchase request amount, although it is possible that, in combination with the additional local conservation, recycled water, and groundwater already developed during the first phase of this variant, the wholesale customers could receive up to their full 2030 purchase request amount of 209 mgd with no shortfall.

Table 13.2 (which is similar to Draft PEIR Table 9.4) summarizes the key characteristics of the Phased WSIP Variant in comparison to the WSIP and other select alternatives considered in the Draft PEIR. Under the Phased WSIP Variant, the SFPUC would continue to rely on water supply sources from local watersheds and the Tuolumne River for up to 265 mgd average annual deliveries and would continue to implement the proposed 10 mgd of conservation, water recycling, and groundwater projects in San Francisco that is included in the WSIP through 2018. An additional 10 mgd of local conservation, water recycling, and groundwater projects could be developed by the SFPUC and/or BAWSCA/wholesale customers. Information on retail and customer purchase requests after 2018 would be confirmed, and target deliveries and water supply sources would be determined.

Table 13.3 (which is similar to Draft PEIR Table 9.5) compares average annual Tuolumne River diversions and drought-year shortages for the Phased WSIP Variant and the proposed program. Under the Phased WSIP Variant, by 2018 only 2 mgd of additional water diversion from the Tuolumne River over existing levels would be needed (on an average annual basis). This limited additional diversion over existing levels would occur in order to meet the WSIP delivery and drought reliability objectives, but no additional Tuolumne River diversions would be made through 2018 for the purpose of serving demand increases.

One objective of this program variant is to minimize increased diversions from the Tuolumne River and to maintain SFPUC deliveries from its watersheds as close to current levels as possible for the near term through 2018, at which time supply delivery needs and the need for additional Tuolumne River deliveries would be reevaluated. To meet the total projected customer water

TABLE 13.2
DESCRIPTION OF PHASED WSIP VARIANT IN COMPARISON TO WSIP AND NO PURCHASE REQUEST INCREASE ALTERNATIVE
(SIMILAR TO DRAFT PEIR TABLE 9.4)

Program Element	Existing Condition	Proposed Program	No Purchase Request Increase Alternative	Phased WSIP Variant	
Planning Year	2005	2030	2030	2018	2030
Retail Customer Purchase Request (2018 / 2030)	91 mgd / NA	91 mgd / 91 mgd	91 mgd / 91 mgd	91 mgd	91 mgd (to be reevaluated by 2018)
Wholesale Customer Purchase Request (2018 / 2030)	174 mgd / NA	194 mgd / 209 mgd	194 mgd / 209 mgd	194 mgd	209 mgd (to be reevaluated by 2018)
SFPUC Regional System Target Delivery Level (annual average)	265 mgd	300 mgd	275 mgd	275 to 285 mgd	To be determined
Target Delivery from SFPUC Watersheds	265 mgd	290 mgd	265 mgd	265 mgd	To be determined
SFPUC Wholesale Customer Target Delivery (annual average for 2018 / 2030)	NA	194 mgd / 209 mgd	184 mgd / 184 mgd	184 mgd / 194 mgd	To be determined
SFPUC Water Supply Sources (during nondrought and drought periods)	▪ 265 mgd from: - Local watersheds (with Calaveras and Crystal Springs Reservoirs operating at reduced levels based on Division of Safety of Dams restrictions); and - Tuolumne River	▪ 290 mgd from: - Local watersheds (with Calaveras and Crystal Springs Reservoirs restored) - Tuolumne River, with increased average annual diversions of about 24 mgd ▪ 10 mgd from: - Recycled water/groundwater/ additional conservation in San Francisco	▪ 265 mgd from: - Local watersheds (with Calaveras and Crystal Springs Reservoirs restored) - Tuolumne River, with increased average annual diversions of about 3 mgd ▪ 10 mgd from: - Recycled water/groundwater/ additional conservation in San Francisco	▪ 265 mgd from: - Local watersheds (with Calaveras and Crystal Springs Reservoirs restored) - Tuolumne River, with increased average annual diversions of about 2 mgd ▪ 10 mgd from: - Recycled water/ groundwater/additional conservation in San Francisco ▪ 10 mgd from: - SFPUC and/or BAWSCA/wholesale customers to develop additional local conservation, recycled water, groundwater in service area	To be determined after further demand, supply studies
Other Water Supply Sources (during nondrought and drought periods)	None	None	▪ *Wholesale customers expected to pursue conservation reuse and/or supplemental supply or conservation to make up for 2030 SFPUC delivery shortfall*	▪ *See above, SFPUC and/or BAWSCA/wholesale customers to develop additional 10 mgd of local conservation, recycled water, or groundwater; or BAWSCA and/or wholesale customers to pursue other supplemental supplies*	

TABLE 13.2 (Continued)
DESCRIPTION OF PHASED WSIP VARIANT IN COMPARISON TO WSIP AND NO PURCHASE REQUEST ALTERNATIVE
(SIMILAR TO DRAFT PEIR TABLE 9.4)

Program Element	Existing Condition	Proposed Program	No Purchase Request Increase Alternative	Phased WSIP Variant
Supplemental Dry-Year Water Supply Sources (for implementation during drought periods only)	None	▪ Additional Tuolumne River diversions from TID and MID transfers of 25 mgd, average over design drought. (This diversion is accounted for in the increased average annual diversion shown above under SFPUC Water Supply Sources.) ▪ Westside Basin conjunctive use, 6 mgd (average over design drought)	▪ Additional Tuolumne River diversions from TID and MID transfers of 1 mgd, average over design drought. (This diversion is accounted for in the increased average annual diversion shown above under SFPUC Water Supply Sources.) ▪ Westside Basin conjunctive use, 6 mgd (average over design drought) ▪ *Wholesale customers expected to pursue supplemental dry-year supply (e.g., water transfer) to make up for drought period supply shortfalls*	▪ Additional Tuolumne River diversions from TID and MID transfers of 2 mgd, average over design drought. (This diversion is accounted for in the increased average annual diversion shown above under SFPUC Water Supply Sources.) ▪ Westside Basin conjunctive use, 6 mgd (average over design drought) ▪ *Wholesale customers expected to pursue supplemental dry-year supply (e.g., water transfer) to make up for drought period supply shortfalls*
Maximum Drought Rationing Policy	No defined limit, but assumed incidental rationing of up to 25%	20%	20% at reduced target delivery level	20% at reduced target delivery level
System Firm Yield	219 mgd	256 mgd	234 mgd	234 mgd
WSIP PEIR Facility Improvement Projects	None	All projects	All projects	All projects
Other Facility Improvements	None	None	None by the SFPUC *Wholesale customers expected to develop other facilities or projects to meet additional demand*	*SFPUC and/or BAWSCA/wholesale customers expected to develop other facilities or projects to meet additional demand*
Delivery, Operations, and Maintenance	As described in Chapter 2, Section 2.3	Improved to meet WSIP goals and objectives (as described in Chapter 3, Section 3.8)	Similar to proposed program (but adjusted for the reduced target delivery level)	Similar to proposed program (but adjusted for the reduced target delivery level)
Permits, Approvals, and other Decisions/Actions	As described in Chapter 2, Sections 2.4 and 2.5	▪ San Francisco Planning Commission certifies Final PEIR ▪ SFPUC adopts CEQA findings/ mitigation monitoring and reporting program and approves and adopts the WSIP ▪ Water transfer agreements with TID and MID ▪ Operating agreements with Daly City, San Bruno, and California Water Service Company for Westside Basin conjunctive-use program ▪ Water sales agreements with retail and wholesale customers (see Chapter 3, Section 3.13)	Same as proposed program except: ▪ Transfer agreements with TID and MID for 1 mgd instead of 23 mgd during drought years ▪ *Agreements with California Department of Health Services for any new drinking water sources developed by wholesale customers that would be introduced into the regional system* ▪ *Permits for any new recycled water projects developed by wholesale customers*	Same as proposed program except: ▪ Transfer agreements with TID and MID for 1 mgd instead of 23 mgd during drought years ▪ *Agreements with California Department of Health Services for any new drinking water sources developed by SFPUC and/or BAWSCA/wholesale customers that would be introduced into the regional system* ▪ *Permits for any new recycled water projects developed by SFPUC and/or BAWSCA/ wholesale customers*

Italic text indicates expected action by wholesale customers.

SOURCE: SFPUC, 2008.

TABLE 13.3
AVERAGE ANNUAL TUOLUMNE RIVER DIVERSIONS AND DROUGHT-YEAR SHORTAGES FOR THE SELECTED ALTERNATIVES[a]
(SIMILAR TO DRAFT PEIR TABLE 9.5)

Scenario	Estimated Tuolumne River Diversions Over the 82-Year Period of Hydrologic Record[b]		Drought-Year Shortages Based on 82-Year Period of Hydrologic Record				Drought-Year Shortages During Design Drought (8.5 years)		
	Average Annual Increase by the SFPUC[c] (mgd)	Average Annual Diversions by the SFPUC (mgd)	Years of Shortages (10% Shortage)	Years of Shortages (20% Shortage)	Years of Shortages (>20% Shortage)	No. of Years Drought-Year Supplies Triggered	Years of Shortages (10% Shortage)	Years of Shortages (20% Shortage)	Years of Shortages (25% to 30% Shortage)
Existing Conditions (2005)	N/A	221	6 out of 82 (1 in 14 years)	8 out of 82 (1 in 10 years)	None	N/A	1	5	1.5
Proposed Program (WSIP 2030)	24	245	6 out of 82 (1 in 14 years)	2 out of 82 (1 in 41 years)	None	24	3	3.5	None
Phased WSIP Variant (2018)	2	223	6 out of 82 (1 in 14 years)	2 out of 82 (1 in 41 years)	None	15	3	3.5	None

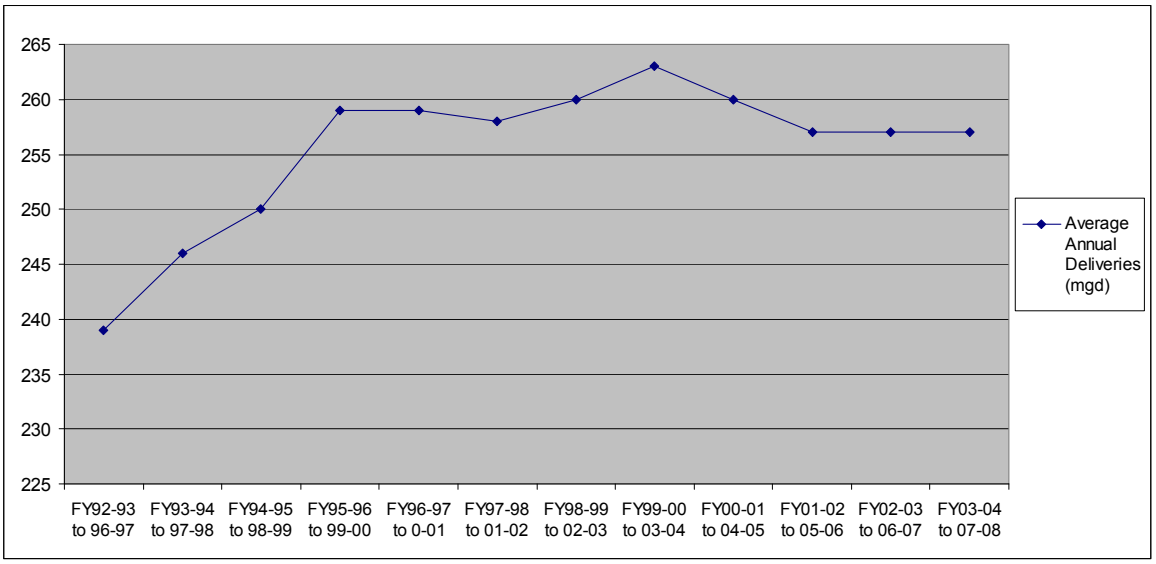
[a] Results from 2008 HH/LSM analyses using updated and refined modeling assumptions. The numbers are not directly comparable to those in Draft PEIR Table 9.5, which are based on 2007 HH/LSM analyses.
[b] Diversion levels represent the average annual amount modeled over the 82-year historical hydrology. Even with a zero average annual increase in diversions, there would still be year-to-year variations in diversions compared to the existing condition due primarily to modified system operations for maintenance and implementation of the conjunctive-use program.
[c] Represents the difference in average annual diversions modeled over 82-year historical hydrology, but does not represent year-to-year variation. Thus, even with zero average annual increase in diversions, there would still be year-to-year variations in diversions compared to the existing condition due primarily to modified system operations for maintenance and implementation of the conjunctive-use program.

delivery needs through 2018 and maintain Tuolumne River diversions at or close to current levels, the SFPUC would implement its proposed 10 mgd of in-city recycled water and groundwater projects and conservation actions plus work with BAWSCA and the wholesale customers to implement another 10 mgd of local recycled water, groundwater, and conservation actions (or BAWSCA and wholesale customers might elect to implement this additional local conservation and supply development themselves without the SFPUC). The SFPUC plans to implement projects to achieve its in-city 10 mgd by 2014 (see Draft PEIR Vol. 1, Chapter 3, p. 3-55 for a description of the proposed Groundwater Projects [WSIP project SF-2]; p. 3-56 for a description of the proposed Recycled Water Projects [WSIP project SF-3]; and Figure 3.6, p. 3-62 for the proposed implementation schedule). Since publication of the Draft PEIR, the wholesale customers have also taken steps to develop the necessary local projects (see the discussion below under the heading Wholesale Customer Actions for further information). The SFPUC will determine with BAWSCA the best way to develop the additional 10 mgd of supply (supply offsets) needed to meet the full wholesale customer needs by 2018.

In implementing the Phased WSIP Variant, the need could arise to temporarily increase deliveries from the Tuolumne River and local watersheds over the 265 mgd average annual target levels to meet customer water delivery needs in the near term, because it might not be possible to implement all of the local projects and actions in time to meet increasing customer demands. The impact analysis for the Phased WSIP Variant recognizes that, between now and 2018, deliveries from the Tuolumne River and local watersheds might increase above the 265 mgd average annual level (to a possible 275 to 285 mgd average annual) for up to a few years. By 2018, and perhaps well before, it is expected that local projects would provide sufficient local supply and conservation to bring SFPUC watershed deliveries back down to current levels, close to 265 mgd.

Under the Phased WSIP Variant, the SFPUC would monitor sales to ensure that annual average sales delivered from the SFPUC watersheds are limited to an average annual of 265 mgd through 2018. The SFPUC would measure and review annual average sales at the close of each fiscal year. **Figure 13.1** presents the five-year rolling average for the past 15 years of actual deliveries from the SFPUC watersheds (from fiscal year 1992/1993 through fiscal year 2007/2008) for the combined retail and wholesale customers. As shown on the graph, the highest five-year rolling average water delivery from the SFPUC watersheds via the regional water system to date was 263 mgd between fiscal year 1999/2000 and fiscal year 2003/2004. Since that time, this average has declined and leveled at 257 mgd for each of the past three years.

In consideration of public health and safety, the SFPUC would not cease water deliveries to customers in the event that total sales in water deliveries from the SFPUC watersheds exceed 265 mgd. However, in the event that sales from the SFPUC watersheds go above the 265 mgd average annual restriction, the SFPUC would provide financial incentives as a mechanism to encourage customers to develop the necessary local supply and conservation programs and discourage additional use of supply from the SFPUC watersheds.



SFPUC Water System Improvement Program . 203287

Figure 13.1
SFPUC Regional Water System Deliveries –
Five-Year Rolling Average

Facility Improvement Projects

Under this variant, the SFPUC would implement the same 22 facility improvement projects as proposed under the WSIP. There would be no difference in the proposed facility sizing, design, siting, or operation between this variant and the WSIP. Although the total average water deliveries from the regional water system would be less under this variant (275 to 285 mgd) than those under the WSIP (300 mgd), the facilities design and sizes would remain the same. Facility design and size are determined by several factors, and reducing the water supply delivery target alone would not reduce the required size of the proposed facilities. The SFPUC determined that individual facilities throughout the regional water system must be designed and sized to meet overall system performance objectives for seismic reliability, water delivery reliability, maintaining high water quality, and meeting water supply goals (SFPUC, 2008d). Sizing for many system components is primarily driven by the need to replenish local storage following a drought, seismic event, unplanned outage, or maintenance shutdown period such that the local system has enough stored water to meet 90 days of demand strictly from the local system; facility sizing is also determined by the need to meet water delivery demand while performing maintenance or in the event of an emergency outage.

Wholesale Customer Actions

The wholesale customers have obligations, through laws, contracts, and other legal instruments, to provide water service to their customers. As described in the Draft PEIR (Vol. 1, Chapter 3, pp. 3-16 to 3-22), the wholesale customers, in conjunction with the SFPUC, conducted a comprehensive assessment of future water use within their service areas and identified the amount

of water needed from the SFPUC, in addition to increased water conservation, to meet customer needs through 2030. The SFPUC wholesale customer purchase requests for 2030, developed as part of the WSIP, total 209 mgd. By approximately 2018, wholesale customer demand on the SFPUC regional system is projected to increase to 194 mgd.

Under the Phased WSIP Variant, the wholesale customers would receive 184 mgd on an average annual basis from the SFPUC watersheds until 2018. The SFPUC is proposing to obtain the remaining 10 mgd needed to meet the projected 194 mgd wholesale customer demand through the development of additional local conservation, recycled water, and groundwater projects. As described above, this additional 10 mgd increment of supply/conservation could either be developed jointly by the SFPUC and BAWSCA and become part of the regional system supply portfolio or it could be developed independently by BAWSCA and/or the wholesale customers and remain separate from the regional system supply portfolio. The SFPUC is meeting with BAWSCA to discuss the best way to develop this additional increment of supply.

How the 265 mgd Limit on Deliveries from the SFPUC Watersheds Could Affect the Wholesale Customers

The ability of each individual wholesale customer to implement additional demand management and/or secure additional water supplies varies. Sixteen of the 27 wholesale customers rely on the SFPUC for 100 percent of their supply (see **Table 13.4**). Only eleven of the 27 wholesale customers have other sources of supply in addition to the SFPUC deliveries: nine have other sources of surface water, groundwater, and/or local recycled water supply and two others have only local recycled water supply. **Table 13.5** (which is the same as Draft PEIR Table 7.2) indicates which agencies have sources of supply other than the SFPUC. The Alameda County Water District (serving Fremont, Newark, and Union City) has a combination of local groundwater (including direct pumping and use of groundwater resources as well as desalination of brackish groundwater from its salinity intrusion barrier well system along the bay shoreline), imported surface water supply from the Delta delivered through the State Water Project (SWP), and local recycled water, in addition to its SFPUC supply. California Water Service Company (three districts), Coastside County Water District, Daly City, and Mountain View each have one or more local resources, including groundwater, surface water, and/or recycled water. Palo Alto and Redwood City both have some local recycled water.

In the South Bay, eight of the SFPUC wholesale customers also lie within the Santa Clara Valley Water District (SCVWD), and some of these customers receive supply from both the SCVWD and the SFPUC. The SCVWD is a special district under state law and is required to serve the inhabitants of its service area. SCVWD is both a state water contractor receiving imported water from the Delta via the SWP and a federal water contractor receiving Delta water from the Central Valley Project (CVP). In addition, the SCVWD manages local surface and groundwater resources for its customers and actively manages a conjunctive-use program that includes groundwater replenishment with imported surface water to manage groundwater use. SFPUC wholesale customers that also receive water from the SCVWD include Stanford University (which also has some local surface water resources), Mountain View, Sunnyvale (which also has local groundwater and recycled water), Santa Clara (which also has substantial local groundwater

TABLE 13.4
SFPUC WHOLESALE CUSTOMERS – SUPPLY SOURCES

SFPUC Wholesale Customers	
Customers Relying on the SFPUC for 100% of Supply	**Customers with Other Supply Sources**
California Water Service (Mid-Peninsula)	Alameda County Water District
City of Brisbane	California Water Service (Bear Gulch and South San Francisco)[a]
City of Burlingame	Coastside County Water District [a]
City of East Palo Alto	City of Daly City
Estero Municipal Improvement District	City of Milpitas
Guadalupe Valley Municipal Improvement District	City of Mountain View [a]
City of Hayward	City of Palo Alto [a]
Town of Hillsborough	City of Redwood City [a]
City of Menlo Park	City of Santa Clara
Mid-Peninsula Water District	Stanford University
City of Millbrae	City of Sunnyvale
North Coast County Water District	
Purissima Hills Water District	
City of San Bruno	
City of San Jose (North)	
Skyline County Water District	
Westborough Water District	

[a] These wholesale customers receive 25 percent or less of their supply from other sources; the SFPUC provides 75 percent or more.

resources and recycled water), and Milpitas (which also has local recycled water). Palo Alto and Purissima Hills Water District lie within the SCVWD service area but do not receive water from the SCVWD. In total, the SFPUC provides about 54 mgd, or 56.4 percent, of the supply to meet the demand of these eight SCVWD customers.

In summary, for five of the 11 customers who have other sources of water supply in addition to the SFPUC supply, the other supply sources make up 25 percent or less of their supply and the SFPUC provides the remaining 75 percent of supply or more. Hence, only a few of the wholesale customers have other substantial sources of supply besides the SFPUC.

Supply shortfalls from the SFPUC regional water system could also affect individual wholesale customers differently because of differences in their supply agreements with the SFPUC. As discussed in the Draft PEIR (Vol. 1, Chapter 2, pp. 2-43 and 2-44, and Vol. 4, Chapter 7, pp. 7-13 and 7-14), the SFPUC currently holds individual agreements with its wholesale customers. A Master Water Sales Agreement between the CCSF and each of the wholesale customers establishes wholesale water rates, cost allocation, water supply allocation, and use of local water. Under the Master Sales Agreement, the CCSF has agreed that the wholesale customers may collectively purchase up to 184 mgd on an average annual basis, subject to reductions in the event

TABLE 13.5
SUMMARY OF 2030 DEMAND PROJECTIONS, WATER SUPPLY ASSUMPTIONS, AND SFPUC PURCHASE ESTIMATES
(SAME AS DRAFT PEIR TABLE 7.2)

Customer	A 2030 Projected Demand (with Plumbing Code Savings) (mgd[a])	B 2030 Projected Conservation Savings (mgd[a])	C 2030 Demand Adjusted for Conservation (mgd[a]) (A - B)	D 2030 Projected Use of Recycled Water (mgd[a])	E 2030 Projected Use of Ground-water Sources (mgd[a])	F 2030 Projected Use of Other Surface Water Sources (mgd[a])	G 2030 Projected Demand Adjusted for Use of Other Sources and Conservation (mgd[a]) (C - D - E - F)	H 2030 Purchase Estimates (mgd[a])	I Percent of Total 2030 Demand (with Plumbing Code Savings) met by SFPUC Purchases (H/A)	J Percent of 2030 Demand Adjusted for Conservation met by SFPUC Purchases (H/C)
Alameda County Water District	59.3	3.16	56.14	1.40	13.98	27.00	13.76	13.76	23%	25%
City of Brisbane	0.93	0.04	0.89				0.89	0.89	96%	100%
City of Burlingame	4.9	0.20	4.7				4.70	4.70	96%	100%
CWS–Bear Gulch District[b,c]	14.06	0.93	13.13			1.37	11.76	11.76	84%	90%
CWS–Mid-Peninsula District[b]	18.1	0.86	17.24				17.24	17.24	95%	100%
CWS–South San Francisco District[b]	9.9	0.56	9.34		1.37		7.97	7.97	81%	85%
Coastside County Water District[d]	3.2	0.18	3.02		0 – 0.30	0 – 0.48	2.24 – 3.02	2.24 – 3.02	70 – 94%	74 – 100%
City of Daly City[e]	9.1	0.44	8.66		1.34 – 3.76		4.90 – 7.32	4.90 – 7.32	54 – 80%	57 – 85%
City of East Palo Alto	4.8	0.16	4.64				4.64	4.64	97%	100%
Estero MID[f]	6.8	0.00 – 0.60	6.2 – 6.8				6.20 – 6.80	6.20 – 6.80	91 – 100%	100%
Guadalupe Valley MID[f]	0.81	0.10	0.71				0.71	0.71	88%	100%
City of Hayward	28.7	0.76	27.95				27.95	27.95	97%	100%
Town of Hillsborough	3.9	0.20	3.7				3.70	3.70	95%	100%
City of Menlo Park	4.7	0.16	4.54				4.54	4.54	97%	100%
Mid-Peninsula Water District	3.8	0.10	3.70				3.70	3.70	97%	100%
City of Millbrae[g]	3.3	0.08 – 0.11	3.19 – 3.27				3.19 – 3.22	3.19	97%	99 – 100%
City of Milpitas	17.7	0.61	17.09	1.77		7.13	8.19	8.20	46%	48%
City of Mountain View	14.8	0.24 – 1.21	13.59 – 14.56		0.05	1.30	12.24 – 13.21	13.20	89%	91 – 97%
North Coast County Water District	3.8	0.00 – 0.19	3.62 – 3.80				3.62 – 3.80	3.61 – 3.80	95 – 100%	100%
City of Palo Alto[h]	14.4	0.60	13.76	0.76			13.00	13.00	91%	94%
Purissima Hills Water District	3.3	0.08	3.22				3.22	3.22	98%	100%
City of Redwood City[i]	13.4	0.59 – 1.02	12.38 – 12.81	0 – 1.00			11.38 – 12.81	11.60 – 12.60	87 – 94%	94 – 98%
City of San Bruno	4.5	0.19	4.32				4.32	4.30	96%	100%
City of San Jose (North)[i]	6.5	0.16	6.34				6.34	6.34	98%	100%
City of Santa Clara	33.9	1.00	32.90	4.00	19.99	4.00	4.91	4.90	14%	15%
Skyline County Water District	0.31	0.01	0.30				0.30	0.30	97%	100%
Stanford University	6.8	0.70	6.10			1.90	4.20	4.20	62%	69%
City of Sunnyvale	26.8	0.70	26.10	1.50	2.60	9.90	12.10	12.10	45%	46%
Westborough Water District[k]	1.03	see note k	1.03				1.03	1.03	100%	100%
Total, Wholesale Service Area	**324**	**13 – 15**	**308 – 311**	**9.4 – 10.4**	**39.3 – 42.1**	**52.6 – 53.1**	**203 – 209**	**204 – 209**	**63 – 65%**	**66 – 67%**
SFPUC Retail Service Area[l]	**93.4**	**0 – 4**	**89.4 – 93.4**	**0 – 4**	**2.5 – 4.5**	**0**	**81 – 91**	**80 – 91**	**86 – 97%**	**89 – 97%**
TOTAL	**417**	**13 – 19**	**398 – 404**	**9.4 – 14.4**	**41.8 – 46.6**	**52.6 – 53.1**	**284 – 300**	**284 – 300**	**68 – 72%**	**71 – 74%**

NOTE: Numbers may not sum due to rounding.

a mgd = million gallons per day.
b CWS = California Water Service Company.
c CWS–Bear Gulch District includes the former Los Trancos County Water District.
d The upper range purchase estimate assumes loss of all local water sources (surface water and groundwater) and the lower range estimate assumes continuation of local sources; both estimates assume Level B water conservation.
e The purchase estimate range reflects a range of potential groundwater usage established under a pilot project, from the sustainable yield (3.76 mgd) to the lowest annual production yield (1.34 mgd), according to Daly City's best estimate of 2030 water purchases (SFPUC, 2004).
f MID = Municipal Improvement District.
g 2030 conservation savings is based on URS 2004c and the City's UWMP as confirmed by the City (Popp, 2007).
h 2030 demand and conservation savings are based on information provided by the City of Palo Alto to the SFPUC (City of Palo Alto, 2005a).
i In November 2005, Redwood City informed the SFPUC that it would be purchasing its low-range estimate of 11.6 mgd due to anticipated implementation of 1 mgd of recycled water in 2030 (City of Redwood City, 2005a). The high-range purchase estimate total of 300 mgd published in URS 2004b remains the SFPUC 2030 purchase estimate total for planning purposes, to be consistent with the previous and ongoing WSIP studies. The purchase estimate range originally submitted apparently reflects the average of the City's estimated conservation savings range plus the originally estimated range of recycled water use.
j Portion of north San Jose only.
k Demand and purchase estimates are based on Westborough Water District's 2005 UWMP, as requested by the District in a letter to the SFPUC (Westborough Water District, 2007). The UWMP discusses ongoing and planned future demand management programs but does not quantify conservation savings in relation to the demand and purchase estimate. The District's original estimate of water purchases indicated conservation savings of 0.020 mgd (SFPUC, 2004).
l The low range of the SFPUC retail customer purchase estimate reflects the identified groundwater, recycled water, and conservation programs totaling 10 mgd in San Francisco that are included as part of the WSIP proposed water supply option.

SOURCES: URS, 2004a; URS, 2004b; URS, 2004c; URS, 2006; SFPUC, 2004; SFPUC, 2007; City of Palo Alto, 2005a; Popp, 2007; City of Redwood City, 2005a; Westborough Water District, 2005 ; Westborough Water District 2007.

of a drought, water shortage, earthquake or other natural disaster, or rehabilitation and maintenance of the system; the 184 mgd amount is referred to as the "supply assurance." The agreement also requires that the wholesale customers employ best efforts to use all sources of water owned or controlled by them, including groundwater. The terms of individual agreements vary among the wholesale customers. In general, there are individual supply assurances for each wholesale customer with two exceptions (see Vol. 5, Appendix E, Table E.1.1, p. E.1-2 for each customer's existing supply assurance from the SFPUC regional water system). The wholesale customers have varying amounts of their individual supply assurance remaining. All but two wholesale customers are under their current supply assurance by some amount, and two agencies have exceeded their individual supply assurance caps; however, collectively, the wholesale customers remain below the 184 mgd supply assurance cap established by the Master Sales Agreement.

The first exception to the SFPUC's supply assurance contracts involves the City of Hayward and the Estero Municipal Improvement District (Estero MID) (serving primarily Foster City and some portions of San Mateo County). Contracts with these two agencies do not specify a limit on purchases from the SFPUC. For these two agencies, the CCSF has agreed to meet all of their water needs in excess of other water sources owned or controlled by them. The agreement with Estero MID expires in 2011, while the agreement with the City of Hayward has no termination date. A specified amount (28 mgd) of the total 184 mgd wholesale customer supply assurance has been set aside by the wholesale customers to meet the long-term supply needs of Hayward and Estero MID. However, Hayward alone projects that it will need to purchase up to 28 mgd from the SFPUC by 2030 (just under 10 mgd more than its fiscal year 2001/2002 delivery purchase). Estero MID has requested purchase of up to 6.8 mgd by 2030. Thus, the combined usage for these two agencies is projected to exceed the 28 mgd reserved for them. If this occurs, then the other wholesale customers would have to reduce their purchases in order to accommodate Hayward and Estero MID deliveries. The Master Sales Agreement provides a method for proportional reduction in the other wholesale customers' supply guarantee in the event that Hayward and Estero MID exceed the supply amount reserved for them.

The second exception to the SFPUC supply assurance contracts involves the Cities of San Jose and Santa Clara. The SFPUC sells water to these two entities on a temporary, interruptible basis; neither city has a supply assurance contract with the SFPUC. As a result, deliveries to these two cities are not accounted for in the 184 mgd supply assurance cap established in the Master Sales Agreement. In fiscal year 2001/2002, these two cities purchased a combined total of 8.26 mgd from the SFPUC system. As part of the WSIP planning and development process, they submitted a request to purchase an additional 2.98 mgd, for a combined total 2030 purchase request of 11.24 mgd. The SFPUC serves northern San Jose, while the remainder of San Jose is served by the SCVWD. The City of Santa Clara receives less than 20 percent of its supply from the SFPUC. Within Santa Clara, however, the SFPUC supply constitutes nearly 90 percent of water supply to the northern part of the city (north of Highway 101), which is largely isolated from the rest of the city's water system. For Santa Clara to serve this area from a source other than the SFPUC, it would not only need to secure the additional supply but also to extend major new infrastructure. Similarly, in San Jose, the SFPUC supply serves the northern San Jose area. Although San Jose and Santa Clara lie within the SCVWD, the District does not have available supply or the necessary treatment

plant capacity or infrastructure reaching these areas that could provide service to compensate for a reduction in SFPUC deliveries; major new facilities would need to be constructed to serve these areas.

In the future under the Phased WSIP Variant through 2018, the Cities of San Jose and Santa Clara could face partial or complete SFPUC water delivery reductions as the other wholesale customers with supply assurance contracts increase their deliveries up to their supply assurance limits and Hayward and Estero MID continue to increase their purchase requests beyond a combined 28 mgd. The San Francisco Planning Department received letters from the SCVWD, the City of San Jose, the City of Santa Clara, and BAWSCA concerning the proposed Phased WSIP Variant (see Vol. 8, Appendix M for copies of these letters). Each of these agencies expressed concern that neither San Jose nor Santa Clara have good alternative treated water supply sources, and that increasing local groundwater pumping would have environmental consequences associated with over-pumping. Historically, over-pumping of groundwater was an issue for these communities and resulted in appreciable land subsidence that was remedied through a combination of actions, including the use of surface water supplies from the SFPUC to reduce the need for pumping. (Refer to the discussion below under the heading Environmental Effects of the Phased WSIP Variant for further information on the potential environmental effects of groundwater pumping increases by San Jose and Santa Clara.)

If SFPUC supplies to San Jose and Santa Clara were interrupted due to increased demand among the remaining wholesale customers, these entities could rely entirely on the SCVWD to meet the portion of their existing demand now being met by the SFPUC. As noted in the SCVWD water supply planning documents, the District relies on the SFPUC to continue to meet the supply needs of these two customers in the future. The SCVWD has not made plans to serve these customers from the supplies that they manage. Similarly, if any of the other customers do not have their demand increases met through the SFPUC, then these customers could increase their reliance on the SCVWD to meet that portion of increased demand.

Water Supply Options

As discussed in the Draft PEIR for the No Purchase Request Increase Alternative (and the No Program Alternative), if the SFPUC does not fully meet the wholesale customer purchase requests, it is assumed that the wholesale customers, either individually or collectively, would pursue supplemental supply sources and/or additional conservation and/or water recycling projects to make up the shortfall in SFPUC water deliveries under this scenario. BAWSCA represents the SFPUC wholesale customers and has the authority to pursue and secure water supplies on behalf of the wholesale customers as well as to coordinate recycled water and conservation projects to benefit its members.

Local Options

Draft PEIR Section 9.2.4, Aggressive Conservation/Water Recycling and Local Groundwater Alternative (Vol. 4, Chapter 9, pp. 9-47 to 9-59) and Section 9.2.8, Modified WSIP Alternative (Vol. 4, Chapter 9, pp. 9-78 to 9-84) provide a discussion of the additional, potential conservation,

recycled water, and groundwater projects that could be implemented by the wholesale customers beyond those projects accounted for in their 2030 purchase request. This information is summarized below. These projects could potentially be implemented to develop the additional 10 mgd of local supply and/or conservation required under the Phased WSIP Variant by 2018, assuming these projects are feasible (see **Table 13.6**, below, which is the same as PEIR Table 9.11). Most of the projects have been developed on a very conceptual level and have technical, institutional, and financial issues to overcome prior to implementation; and contain uncertainties with regard to water quality issues, end-users, long-term sustainable yield, and production rates. The SFPUC is interested in working with BAWSCA and the wholesale customers in the further development of local conservation, recycled water, and/or groundwater projects to meet the full customer supply needs through 2018. The SFPUC is considering the creation of financial mechanisms to support actions in the wholesale customer service areas as well as direct participation in local projects (SFPUC, 2008c).

In March 2008, BAWSCA authorized a study, called the BAWSCA Water Conservation/Recycling Implementation Plan, to identify the specific conservation actions needed to secure an additional 10 mgd of supply savings through conservation savings and reclamation by 2030, as was indicated to by BAWSCA in its comments on the Draft PEIR (see Vol. 6, Section 12.3, Comment L_BAWSCA1-53). BAWSCA moved in August 2008 to secure a consultant to prepare the plan, which is scheduled to be completed by the end of June 2009. The plan will include a 10-year implementation plan showing proposed actions, schedules, costs, and funding alternatives to achieve the combined commitments shared by BAWSCA and its member agencies to achieve a total of 58 mgd of water conservation and recycling between 2001 and 2030 (BAWSCA, 2008b). The commitment to develop 10 mgd of local recycled water and conservation is in addition to the amount the wholesale customers previously committed to in the development of their 2030 purchase requests as part of the WSIP planning process (BAWSCA, 2008a).

As discussed in the Draft PEIR analysis of the Aggressive Conservation/Water Recycling and Local Groundwater Alternative (Vol. 4, Chapter 9, pp. 9-47 to 9-59), studies to date suggest that it would be difficult for the wholesale customers to develop sufficient local conservation, reuse, and groundwater projects to meet their full 2030 needs. Thus, after 2018, if the SPFUC decides to continue limiting deliveries from its watersheds to 265 mgd, it could be difficult for the SFPUC, BAWSCA, and the wholesale customers to develop sufficient additional local supply through groundwater, recycled water, and conservation to satisfy projected 2030, long-term demands. With respect to the potential for additional local groundwater development, the wholesale customers with appreciable groundwater resources (i.e., Daly City, Santa Clara, Sunnyvale, and Alameda County Water District) are already maximizing or planning to maximize their use of this supply, while other customers have no or only a limited potential for groundwater development. As shown on Table 13.6, the wholesale customers identified potential groundwater projects totaling just under 3 mgd. The wholesale customers with groundwater resources risk the potential for overdrafting their local aquifers if they increase the use of this resource. This is a particular concern for South Bay communities such as San Jose and Santa Clara that have a history of over-pumping groundwater, land subsidence, and loss of aquifer storage capacity.

TABLE 13.6
POTENTIAL REGIONAL RECYCLED WATER, GROUNDWATER, AND CONSERVATION PROJECTS
(SAME AS DRAFT PEIR TABLE 9.11)

Location/Jurisdiction	Type of Supply	Description	Low-Range Yield (mgd)	High-Range Yield (mgd)
Category 1 – Projects Likely to be Implemented				
City of Daly City	Recycled Water	Expansion of recycled water uses from an existing facility to irrigate an additional park and landscape medians	-	0.01
North Coast County Water District/San Francisco	Recycled Water	Various irrigation uses for school grounds and highway uses	0.15	0.58
		Subtotal Category 1	**0.15**	**0.6**
Category 2 – Eligible Projects in Early Planning Stages				
Mountain View	Recycled Water	Irrigation and industrial usage – joint project with City of Palo Alto	-	1
Various	Conservation	Eight conservation measures to be implemented by a regional body	2.3	5.7
Various	Conservation	Seven additional conservation measures to be implemented by a regional body	0.6	1.5
Palo Alto	Recycled Water	Irrigation in Palo Alto and East Palo Alto	-	1
Cal Water–Mid-Peninsula	Groundwater	New well in Mid-Peninsula District for potable use	-	1
Cal Water–Bear Gulch	Groundwater	New well shared with Menlo Park for potable use	-	1
East Palo Alto	Groundwater	Reestablish use of existing well	-	0.5
Redwood City	Recycled Water	Expand recycled water system for use by additional customers outside of service area	2.2	4.5
South San Francisco and San Bruno	Recycled Water	Replace current groundwater irrigation uses with recycled water	-	0.3
		Project Overlap Adjustment[1]		(1.5)
		Subtotal Category 2	**5.1**	**15**
Category 3 – Potentially Eligible Projects for Future Consideration				
Menlo Park	Groundwater	Groundwater well for emergency use	Unknown	Unknown
Sunnyvale	Recycled Water	Extend existing recycled water project	-	0.7
Various	Conservation	Eight additional conservation measures to be implemented by a regional body	0.5	1.4
Burlingame	Groundwater	Rehabilitate existing well	-	0.02
Burlingame	Recycled Water	Irrigation of commercial landscaping	-	0.25
		Project Overlap Adjustment		(0.14)
		Subtotal Category 3	**0.5**	**2.23**
Total			**5.75**	**~19**

[1] Project overlap adjustment represents the amount of potential conservation program savings overlap with respect to other projects to avoid double counting.

SOURCE: SFPUC, 2007b.

Imported Supply and/or Desalination Options

Other options for potential supplemental water sources that the wholesale customers could pursue to make up for the SFPUC water delivery shortfall that could occur under this variant are seawater or brackish water desalination and surface water transfers, potentially coupled with conjunctive groundwater use and/or additional surface water storage. These potential supplemental supply options are discussed in the Draft PEIR, primarily in Section 9.2.2, No Program Alternative (Vol. 4, Chapter 9, pp. 9-25 to 9-40), but also in Section 9.2.3, No Purchase Request Increase Alternative (Vol. 4, Chapter 9, pp. 9-40 to 9-47).

Regarding water purchases or transfers, statewide trends indicate that while urban water use is increasing, agricultural water use is decreasing, in part because agricultural water users are selling water rights or contracts to urban agencies (DWR, 2005). Potential sources of supplies for the wholesale customers include water-rights holders north of the Delta, in the Delta, or south of the Delta. 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. The wholesale customers and/or BAWSCA could face challenges to water purchases and transfers pertaining 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[3] (Johnson and Loux, 2004). Existing water delivery infrastructure could theoretically be used through agreements with other agencies (such as the DWR, USBR, SFPUC, SCVWD, East Bay Municipal Utility District, or Alameda County Water District) to convey water to the wholesale customers, if and when system capacity is available. Construction or expansion of interties or connecting pipelines in urban areas would likely be required.

Since the Draft PEIR was released in June 2007, a series of events has affected the feasibility of executing water transfers that involve moving water from or through the Sacramento–San Joaquin River Delta. These events are primarily related to endangered species issues and include: the DWR's 10-day shutdown of the State Water Project (SWP) Delta diversions in the summer of 2007 to protect delta smelt; the Judge Wanger decision in late 2007 regarding delta smelt("Wanger 2007 Decision"), which imposed interim export pumping restrictions tied to flow conditions on Old and Middle Rivers in the Delta; the Judge Wanger decision to invalidate the Biological Opinion for the coordinated operations plan for the CVP and SWP known as the OCAP (Operations Criteria & Plan) on anadromous fish, including steelhead, winter-run and spring-run salmon, and green sturgeon (Wanger Decision 2008); the Endangered Species Act reconsultation now in progress for the OCAP, which will establish revised long-term operating requirements for the CVP and SWP operations to protect endangered species (replacing both the Wanger 2007 and Wanger 2008 decisions); and the proposed Bay Delta Conservation Plan, which includes alternatives for substantially modifying conveyance facilities and operations for the state and federal water systems that now use the Delta for conveyance, and for which the state and

[3] Wheeling arrangements are agreements to use existing infrastructure owned by a third party to transport/convey water from a source to a customer.

federal environmental review processes have recently been initiated (spring 2008). This series of events has made the potential for securing a water transfer from an entity north of the Delta less feasible now than it was when the Draft PEIR was published.

Another potential source of supplemental water for the wholesale customers could be increased agricultural water conservation in the San Joaquin Valley such that surface water conserved in these agricultural areas could then be delivered to the Bay Area. BAWSCA and some of its member agencies have proposed the implementation of additional agricultural water conservation beyond that included in the Modified WSIP Alternative (refer to Vol. 7, Chapter 14, **Section 14.10, Master Response on Modified WSIP Alternative**). According to these proposals, the water saved would accumulate in Don Pedro Reservoir and could be used to increase flows in the Tuolumne River below La Grange Dam or could be conveyed to water users in the Bay Area via a water exchange agreement with TID and MID. The SFPUC regards any project intended to increase agricultural water conservation beyond the level needed to reduce the impacts of the WSIP to a less-than-significant level to be separate from the WSIP. Any such agreements would be undertaken independently of the WSIP. If the Modified WSIP Alternative, or this element of it, is selected as the preferred course of action, the SFPUC would work with TID, MID, or another water agency to develop the transfer of conserved water that is included in the Modified WSIP Alternative. BAWSCA could choose to pursue a separate agricultural water conservation project to augment this transfer, but if the SFPUC were to participate in the project, it would be considered a distinct action from the WSIP or any alternative/variant of the WSIP. This is one option BAWSCA and its member agencies could pursue in order to secure a supplemental supply.

Use of seawater or brackish water desalination technologies to supplement supplies would involve the construction and operation of a desalination plant and related infrastructure. Such a project could occur on a local or regional level. For example, the Alameda County Water District has developed a local desalination facility to treat brackish groundwater pumped from local wells to blend with other drinking water supplies. The SFPUC is currently participating in a study on a potential regional desalination facility that might serve multiple Bay Area communities. The Draft PEIR includes a description of the facilities and environmental impacts of desalination in Section 9.2.6, Year-round Desalination at Oceanside Alternative (Vol. 4, Chapter 9, pp. 9-66 to 9-74) and Section 9.2.7, Regional Desalination for Drought Alternative (Vol. 4, Chapter 9, pp. 9-74 to 9-78). Desalination represents a potential new local source of water.

Ability to Meet Program Objectives

Table 13.7 (similar to Draft PEIR Table 9.6) summarizes the ability of the Phased WSIP Variant to meet the program objectives as compared to the WSIP and select other alternatives. Through 2018, the Phased WSIP Variant would meet many, but not all, of the program objectives. Given the proposed 265 mgd annual average limitation on deliveries from the SFPUC watersheds, the wholesale customers would receive up to 184 mgd from the SFPUC watersheds and would need to quickly develop an additional 10 mgd of local supply and conservation by 2018. Because the Phased WSIP Variant has not already identified specific local projects for implementation to secure the additional 10 mgd needed to fully meet the wholesale customer demand through 2018,

TABLE 13.7
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROGRAM OBJECTIVES[a]
(SIMILAR TO DRAFT PEIR TABLE 9.6)

Objectives	Proposed Program	No Program Alternative	No Purchase Request Increase Alternative	Phased WSIP Variant
Water Quality				
Design improvements to meet current and foreseeable future federal and state water quality requirements?	Yes	Yes	Yes	Yes
Provide clean, unfiltered water originating from Hetch Hetchy Reservoir and filter all other surface water sources?	Yes	Yes	Yes	Yes
Continue to implement watershed protection measures?	Yes	Yes	Yes	Yes
Seismic Reliability				
Complies with current seismic standards?	Yes	No	Yes	Yes
Capable of delivering basic service to all regions in the service area following a major earthquake?	Yes	No	Partial	Partial
Facilities restored to meet average-day demand within 30 days of a major earthquake?	Yes	No	Partial	Partial
Delivery Reliability				
Provides operational flexibility to allow for planned maintenance without service interruptions?	Yes	No	Yes	Yes
Provides operational flexibility and system capacity to replenish local reservoirs, as needed?	Yes	No	Yes	Yes
Capable of minimizing risk of service interruption due to unplanned facility upsets or outages?	Yes	No	Yes	Yes
Capable of serving average 2030 demand of 300 mgd with one planned shutdown of a major facility and one unplanned facility outage?	Yes	No	Partial	Partial
Water Supply				
Meets average annual purchase requests of 300 mgd during nondrought years for system demands through 2030?	Yes	Partial	No, 275 mgd	No, 275–285 mgd
Meets 20% systemwide rationing limit during droughts?	Yes	No	Partial	Partial
Meets system firm yield of 256 mgd?	Yes	No	No	No
Diversifies water supply options during nondrought and drought periods?	Yes	No	Yes	Yes
Improves use of new water sources and drought management, including use of groundwater, recycled water, conservation, and transfers?	Yes	No	Yes	Yes

TABLE 13.7 (Continued)
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROGRAM OBJECTIVES[a]
(SIMILAR TO DRAFT PEIR TABLE 9.6)

Objectives	Proposed Program	No Program Alternative	No Purchase Request Increase Alternative	Phased WSIP Variant
Sustainability				
Manages natural resources and physical systems to protect watershed ecosystems?	Yes	Yes	Yes	Yes
Meets current and anticipated legal requirements for protection of fish and other wildlife habitat?	Yes	Yes	Yes	Yes
Manages natural resources and physical systems to protect public health and safety?	Yes	No	Yes	Yes
Cost-effectiveness				
Ensure cost-effective use of funds?	Yes	No and likely greater cost	Unknown, but greater cost	Unknown, but greater cost
Maintains gravity-driven system?	Yes	Yes	Yes	Yes
Implement regular inspection and` maintenance program for all facilities?	Yes	No	Yes	Yes

NOTES:

[a] This assessment is based on SFPUC actions under each alternative only and does not account for the actions that BAWSCA and/or the wholesale customers might take in order to make up for any shortfall in the regional system's ability to meet the program objectives. See text for a discussion of the ability of each alternative to meet the objectives. In general, the terms in the table are used as follows:

Yes: Indicates that the alternative would fully meet the sub-objective at an equivalent level to the WSIP.

Partial: Indicates that the alternative could meet the objective in part, but it would not fully meet the objective at an equivalent level to the WSIP due to variation associated with the alternative, such as the reduced delivery targets, additional facility requirements, and associated issues. Both the No Purchase Request Increase Alternative and the Phased WSIP Variant would include the full set of WSIP facilities. Thus, the facilities would be capable of delivering and managing supplies to fully meet the 2030 WSIP objectives, but the proposed supply scenarios under these alternatives would not; as a result, these alternatives/variants would only partially meet the full WSIP objective.

No: Indicates that the alternative would not meet the sub-objective.

there is less certainty that this variant could meet the SFPUC's water supply objective compared to the WSIP. It appears feasible to develop additional local conservation, recycled water, and groundwater to provide another 10 mgd, but there is substantial additional work to be completed in order to develop, review, approve, and implement these local actions and projects by 2018. Thus, due to this uncertainty, the table indicates that Phased WSIP Variant would only *partially* achieve those objectives associated with fully meeting customer purchase requests. The Phased WSIP Variant would meet the drought reliability objective at the reduced water supply delivery level.

The Phased WSIP Variant would fully meet the WSIP level of service goal for water quality (although the SFPUC would not be responsible for the quality of any supplemental water supply pursued by the wholesale customers under this scenario). Seismic reliability would be improved over existing conditions; however, because this variant would limit water supply to the SFPUC customers through 2018, this option would not meet the WSIP objective of providing 300 mgd average-day demand through 2030.

Delivery reliability of the regional system would be similar to that under the WSIP; however, this variant would only partially meet those objectives because it would not meet the average annual projected demand of 300 mgd in 2030 under maintenance or outage conditions but instead would meet a reduced target delivery set for 2018. Similar to the WSIP, comprehensive and regular repair and maintenance of the regional system would occur under this variant without service interruptions, and the risk of service interruptions due to unplanned facility upsets or outages would be minimal. Facilities would be in place to replenish local reservoirs as needed to prepare for drought, and the system would remain predominantly gravity-driven.

The Phased WSIP Variant would achieve the WSIP's water supply level of service goal during nondrought periods through the year 2018, but would not achieve the 2030 WSIP program goal. This variant would meet the WSIP objective of limiting drought-year rationing to a maximum of 20 percent systemwide, but it would achieve this objective at the reduced delivery level only.

Environmental Impacts of the Phased WSIP Variant Compared to those of the WSIP

The environmental effects of the Phased WSIP Variant would be similar to those described for the No Purchase Request Increase Alternative if the SFPUC decides to continue limiting average annual water deliveries from the SFPUC watersheds to 265 mgd beyond the year 2018. If the SFPUC decides in 2018 to increase water deliveries from the SFPUC watersheds to the wholesale customers, then the environmental impacts would be the same or similar to those evaluated for the WSIP or the Modified WSIP Alternative.

Facility Construction and Operation Impacts

WSIP Facility Improvement Projects

The Phased WSIP Variant would have the same impacts associated with proposed facility construction and operation as the WSIP. The 22 facility improvement projects proposed under the WSIP would also be implemented under the Phased WSIP Variant to meet the intent of the water quality, seismic reliability, delivery reliability, and water supply goals of the WSIP. All four of these goals are factored into the decision on how to size the WSIP's individual facility improvement projects. Even if the average annual diversions from the Tuolumne River were to remain within the current historical levels, the SFPUC would move forward with all projects as identified and sized under the WSIP in order to provide improved reliability and operational flexibility to perform the maintenance that has been deferred in the past and that is necessary in the future (SFPUC, 2008d).

Other Facilities Potentially Developed by the Wholesale Customers

The types of projects that the wholesale customers might pursue to reduce demand and/or supplement the surface water supplies delivered by the regional water system from the SFPUC watersheds, and the potential facility and operations impacts associated with such projects are discussed in the Draft PEIR in Section 9.2.2, No Program Alternative (Vol. 4, Chapter 9, pp. 9-34 to 9-37) and Section 9.2.4, Aggressive Conservation/Water Recycling and Local Groundwater Alternative (Vol. 4, Chapter 9, pp. 9-55 to 9-57).

In general, certain types of impacts are common to water supply transfers/acquisition and include: the cessation of water application to lands irrigated by the water being transferred; changes related to flows, fisheries, and water quality; and impacts caused by the use of existing or the construction of new infrastructure. Typically, the water-rights holder previously applied the water to agricultural land. If water is taken from agricultural customers, rather than implementing agricultural conservation measures, the transfer can result in the conversion of agricultural land to nonagricultural land. Beneficial environmental effects (related to retiring drainage-impaired lands, reducing the application of pesticides, etc.) can also occur. The need for new facilities and/or changes in the operations of existing facilities depend on the source of supply (e.g., the Tuolumne River through transfers with TID and MID, water-rights holders north of the Delta, in the Delta, or south of the Delta), the quantity of supply, the means of conveyance, and any additional storage requirements. Construction or expansion of interties or connecting pipelines could be required, potentially resulting in impacts similar to those described for the WSIP pipeline projects. The types of impacts associated with water supply acquisition projects are summarized in **Table 13.8** (which is the same as Draft PEIR Table 9.10). Depending on the facilities needed to convey the supplemental supplies to the wholesale customer service areas, the construction and operation of such facilities could result in a full range of construction and operational impacts similar to those described in Chapter 4 (Vol. 2) for the WSIP facilities in the South Bay and Peninsula areas (such as traffic, air quality, noise, energy use, waste disposal, and vibration).

TABLE 13.8
SUMMARY OF POTENTIAL IMPACTS AND MITIGATION STRATEGIES ASSOCIATED WITH REPRESENTATIVE WATER SUPPLY ACQUISITION PROJECTS
(SAME AS DRAFT PEIR TABLE 9.10)

Actions Associated with Water Supply Acquisition Projects	Potential Impacts	Mitigation Strategy
Supplemental Water Supply Source		
Increased Water Use Efficiency/Conservation (e.g., conversion to drip irrigation); tiered water pricing	Reduced groundwater recharge. Exposure of soils to wind erosion leading to air quality impacts. Could lead to increased groundwater pumping.	None required. See below regarding increased groundwater pumping.
Conversion of More Water-Intensive to Less Water-Intensive Crops, Land Fallowing	Land fallowing could create pressure to convert land to urban uses and loss of agricultural land. Economic impacts to community.	Include consideration of farming interests in decision-making process for transfer.
Increased Groundwater Pumping/Conjunctive Use of Groundwater	Groundwater level reductions and overdraft if there is insufficient sustainable yield to accommodate increased pumping. Water quality issues include decreased aesthetic quality in drinking water (hardness, tastes, odors), health risk from potential contaminants in groundwater basin.	Determine sustainable yield of the basin, implement monitoring program, regulate groundwater pumping to preserve safe yield, provide treatment and/or blending if necessary to remove contaminants and control taste and odor. Local assistance programs for remediation of affected wells.
Delta Diversions	Potential impacts on sensitive Delta fisheries including: winter-run, spring-run Chinook salmon, Delta smelt, steelhead trout, and Delta splittail.	Compliance with existing and future pumping requirements related to threatened and endangered species protection.
	Changes in Delta inflow, outflow. Potential impacts on flows associated with wheeling Delta transfers through the Delta, resulting in secondary impacts on Delta fisheries and other biological resources.	Transfer would require review/approval by applicable regulatory agencies. Analysis of flow impacts and commitment to minimize adverse secondary impacts on biological resources (e.g., through transfer timing, pumping restrictions).
	Water quality for the Delta and downstream water users (including salinity, bromides, potential contaminants from agricultural and industrial runoff, taste and odor problems, disinfection byproducts, and temperature).	Compliance with existing and future applicable water quality control. Regulations. Treatment to bring up to water quality equitable to Tuolumne River.
	Water quality for the Delta and downstream water users (including salinity, bromides, and temperature).	Transfer would require review/approval by applicable regulatory agencies. Analysis of flow impacts and commitment to minimize adverse impacts on other water users (e.g., through transfer timing, pumping restrictions).

TABLE 13.8 (Continued)
SUMMARY OF POTENTIAL IMPACTS AND MITIGATION STRATEGIES ASSOCIATED WITH REPRESENTATIVE WATER SUPPLY ACQUISITION PROJECTS

Actions Associated with Water Supply Acquisition Projects	Potential Impacts	Mitigation Strategy
Facilities Required		
Conveyance	Mostly temporary impacts from construction of pipelines, valves, and pumps (disturbance of soils, surface water quality, biological resources, cultural resources, air quality, traffic, noise, land use, hazardous materials, aesthetics).	Most impacts associated with facility construction could be mitigated to a less-than-significant level with the types of measures identified in Chapter 6. As is the case with the proposed WSIP facilities, some impacts (e.g., short-term noise and traffic) could be unavoidable.
Pumping	Noise, energy consumption, air pollutant emissions from energy consumption.	Muffle noise. Use energy-efficient pumps and alternative energy sources.
Treatment	Temporary construction impacts, including land use, traffic, noise and air quality impacts. Potential long-term impacts could include increase in energy consumption, air pollutant and greenhouse gas emissions from energy consumption.	Use standard construction mitigations. Use energy-efficient pumps and alternative energy sources.
Groundwater Basin Storage of Surface Water	Potential degradation of groundwater quality, hydrofracturing (injection).	Pretreatment, groundwater quality monitoring, groundwater basin modeling, modifications to recharge and pumping practices.
Storage – Development of New Offstream Storage	Temporary and long-term impacts from construction of dam, pipelines, pumps, and appurtenant features (direct and indirect impacts on wetland and upland fish and wildlife and attendant habitat; impacts related to cultural resources, air quality, traffic, noise, land use, aesthetics, etc.).	Most impacts associated with facility construction could be mitigated to a less-than-significant level with the types of measures identified in Chapter 6. Some impacts would likely be unavoidable.

If desalination technologies were used to supplement supplies, implementation of a desalination project to augment wholesale customer water supplies would result in the full range of construction impacts at the proposed facility location (such as traffic, air quality, noise, and vibration) as well as operational impacts related to aquatic resources, water quality, energy consumption, air quality, visual resources, land use and planning, traffic, and greenhouse gas emissions. The programmatic impacts of construction and operation of a desalination facility are described in the Draft EIR under WSIP Variant 2, Regional Desalination for Drought (Vol. 4, Chapter 8 (pp. 8-24 to 8-32).

Similar to the Aggressive Conservation/Water Recycling and Local Groundwater Alternative, the Phased WSIP Variant could also result in construction and operation of extensive additional recycled water and groundwater facilities in the wholesale customer service areas; thus, collective impacts in the Bay Division and Peninsula Regions and associated cumulative effects would occur. The types of impacts associated with implementation of the local recycled water and groundwater projects are summarized in **Table 13.9** (which is the same as Draft PEIR Table 9.12) and generally relate to construction of new infrastructure, water quality, and groundwater resources, and operational uses of energy and long-term air quality emissions.

Water Supply and Systems Operations Impacts

Tables 13.10, **13.11**, and **13.12** show the significance of the environmental impacts of the Phased WSIP Variant in the Tuolumne River, Alameda Creek, and Peninsula watersheds compared to the potentially significant impacts identified for the WSIP. Under the Phased WSIP Variant, the SFPUC would limit deliveries from the SFPUC watersheds to 265 mgd on an average annual basis, which would include 184 mgd to the wholesale customers and 81 mgd to the retail customers. In 2018, the SFPUC would decide whether to continue this limit on deliveries from the SFPUC watersheds or to increase it after completing further demand and supply option studies. The impact summary tables show the significance of impacts for the Phased WSIP Variant as the SFPUC proposes to implement it through 2018, and also for a potential 2030 implementation scenario that includes an increase in deliveries from the SFPUC watersheds up to the full level provided under the WSIP. The effects of the Phased WSIP Variant through 2018 would be similar to those described for the No Purchase Request Increase Alternative. For the 2030 scenario, while the SFPUC plans to reconsider water demand and water supply and make a later decision about the appropriate amount of SFPUC watershed deliveries after 2018, this 2030 scenario represents a potential “worst-case” impact assessment with respect to the potential level of effect on the SFPUC watersheds, particularly the Tuolumne River watershed, that might occur under the Phased WSIP variant. For this 2030 scenario, the impacts of the Phased WSIP Variant are the same as those of the Modified WSIP Alternative, since it assumes that 20 mgd of local conservation, recycled water, and groundwater projects would be implemented by 2018.

Tuolumne River Watershed

The significant impacts of the WSIP and the Phased WSIP Variant in the Tuolumne River watershed are shown in Table 13.10. Overall, the impacts of the Phased WSIP Variant through 2018 would be less than the impacts of the WSIP.

TABLE 13.9
SUMMARY OF POTENTIAL IMPACTS AND MITIGATION STRATEGIES FOR RECYCLED WATER AND GROUNDWATER PROJECTS
(SAME AS DRAFT PEIR TABLE 9.12)

Potential Impact	Mitigation Strategy
Groundwater Resources. Potential for increased groundwater pumping, groundwater level reductions, and overdraft if there is insufficient sustainable yield to accommodate increased pumping.	Determine sustainable yield of the basin, implement monitoring program, regulate groundwater pumping to preserve safe yield.
Surface Water, Groundwater Quality, and Public Health Issues. Recycled water applied to the irrigated lands would infiltrate through the subsurface levels, potentially affecting surface and groundwater quality. Groundwater may have contaminants with potential health effects. Groundwater lowers the aesthetic quality of the water through increased hardness, and potential for tastes and odors.	Comply with Title 22 Water Recycling Criteria. Groundwater may require disinfection, treatment and/or blending.
Energy use. Operation of both recycled water and groundwater projects would require increased energy use for treatment and distribution, and pumping. Increased energy production to support these activities along with plant operation would, in turn, generate additional air pollutant emissions, including greenhouse gases emissions.	Energy efficiency measures.
Treatment. Temporary construction impacts (disturbance of soils, surface water quality, biological resources, cultural resources, air quality, traffic, noise, land use, hazardous materials). Potential long-term impacts could include odor, depending on treatment processes and location relative to sensitive receptors. Plant operations could also generate long-term noise, traffic, and visual impacts depending on facility site location(s)and increased energy consumption and air pollutant emissions. **Pumping.** (groundwater pumping station)	Most impacts associated with facility construction could be mitigated to a less-than-significant level with the types of measures identified in Chapter 6. As is the case with the proposed WSIP facilities, odor control features (scrubbers) could reduce any odor impacts to a less-than-significant level.
Conveyance. Mostly temporary impacts from construction of pipelines, valves, and pumps (disturbance of soils, surface water quality, biological resources, cultural resources, air quality, traffic, noise, land use, hazardous materials, aesthetics).	Most impacts associated with facility construction could be mitigated to a less-than-significant level with the types of measures identified in Chapter 6. As is the case with the proposed WSIP facilities, some impacts (e.g., short-term noise and traffic) could be unavoidable.
Storage. Temporary construction impacts (disturbance of soils, surface water quality, biological resources, cultural resources, air quality, traffic, noise, land use, hazardous materials) and potential long-term impacts based on site-specific characteristics (e.g., slope stability, location within a scenic viewshed).	Most impacts associated with facility construction could be mitigated to a less-than-significant level with the types of measures identified in Chapter 6. As is the case with the proposed WSIP facilities, some impacts (e.g., short-term noise and traffic) could be unavoidable. Prepare and implement recommendations from a geotechnical study, implement measures to reduce visual contrast with surroundings (e.g., backfilling, earth-tone paint).

TABLE 13.10
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – TUOLUMNE RIVER WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Section 5.3.6, Fisheries				
Impact 5.3.6-4: Effects on fishery resources along the Tuolumne River below La Grange Dam.				
	In wet or above-normal years when Don Pedro Reservoir is being filled, changes in the timing and duration of releases from the reservoir would decrease average monthly flows along the lower Tuolumne River beneath La Grange Dam. The greatest average flow reductions would occur during June and could result in elevated water temperatures. Changes in stream flow and water temperature would result in a reduction in the linear extent of suitable habitat for rearing Chinook salmon and oversummering steelhead/rainbow trout, potentially causing adverse affects on these fish populations in the lower Tuolumne River.	PSM	LS when average annual deliveries from the watersheds are maintained at 265 mgd or less; PSM if deliveries exceed 265 mgd	PSM
Section 5.3.7, Terrestrial Biological Resources				
Impact 5.3.7-2: Impacts on meadow/alluvial features along the Tuolumne River below O'Shaughnessy Dam.				
▪ Sensitive habitats	Delayed snowmelt releases, reductions in flow, and the resulting reduction in groundwater recharge would result in an incremental reduction in the extent and diversity of wetland and riparian habitats, including sensitive wetland and riparian habitats in the Poopenaut Valley.	PSM	PSM	PSM
▪ Key special-status species	A reduction in wetland and riparian habitat would reduce suitable breeding habitat for key special-status species potentially occurring along this reach (e.g., foothill yellow-legged frog, California red-legged frog, and willow flycatcher), the populations of which are already critically reduced in the Sierra Nevada.	PSM	PSM	PSM
▪ Other species of concern	A reduction in the extent and diversity of wetland and riparian habitats would reduce habitat quality and extent for animal and plant species of concern.	PSM	PSM	PSM
▪ Common habitats and species	All habitats affected by the WSIP are considered sensitive. The WSIP could affect a large number of common animal species that depend on sensitive meadows and larger riparian areas for food and cover.	PSM	PSM	PSM
Impact 5.3.7-6: Impacts on biological resources along the Tuolumne River below La Grange Dam.				
▪ Sensitive habitats	Delayed spring releases and reductions in average and total flow (particularly during and following an extended drought) below La Grange Dam would reduce or eliminate suitable conditions for the recruitment of some riparian species along the river.	PSM	LS when average annual deliveries from the watersheds are maintained at 265 mgd or less PSM if deliveries exceed 265 mgd	PSM

TABLE 13.10 (Continued)
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – TUOLUMNE RIVER WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Section 5.3.7, Terrestrial Biological Resources (cont.)				
▪ Key special-status species	Because of the known presence of key special-status species and the very limited amount of remaining suitable habitat along this reach of the Tuolumne River, this incremental impact would be potentially significant.	PSM	LS when average annual deliveries from the watersheds are maintained at 265 mgd or less PSM if deliveries exceed 265 mgd	PSM
▪ Other species of concern	Species of concern that would be adversely affected by changes in the extent and quality of suitable riparian habitat include western pond turtle, several bat species, and a wide variety of riparian- and marsh-associated bird species.	PSM	LS when average annual deliveries from the watersheds are maintained at 265 mgd or less PSM if deliveries exceed 265 mgd	PSM
▪ Common habitats and species	The populations of common species that depend on riparian habitat could be adversely affected by the alteration of habitat.	PSM	LS when average annual deliveries from the watersheds are maintained at 265 mgd or less PSM if deliveries exceed 265 mgd	PSM

LS = Less than Significant, no mitigation required
SM or PSM = Significant or Potentially Significant, can be Mitigated to less than significant
SU or PSU = Significant Unavoidable or Potentially Significant Unavoidable, cannot be mitigated to less than significant

[a] Under the Phased WSIP Variant through 2018, the SFPUC would limit the average annual SFPUC watershed deliveries to 265 mgd (approximately current levels).
[b] While the SFPUC would not make a decision about regional system deliveries for 2030 until 2018, for purposes of impact analysis a potential "worst-case" 2030 scenario was evaluated for the Phased WSIP Variant that assumes SFPUC watershed deliveries would increase after 2018 up to the 280 mgd level proposed under the Modified WSIP Alternative.

TABLE 13.11
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – ALAMEDA CREEK WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Section 5.4.1, Stream Flow and Reservoir Water Levels				
Impact 5.4.1-2: Effects on flow along Alameda Creek below the diversion dam.				
	In all year types, system operations under the WSIP would increase diversions from Alameda Creek to Calaveras Reservoir between the months of December and May, nearly eliminating low and moderate (1 to 650 cubic feet per second) flows in Alameda Creek downstream of the diversion dam and substantially reducing many higher (greater than 650 cubic feet per second) flows that have occurred since 2002. The resultant reduction in stream flows and alteration of the stream hydrograph is considered an adverse effect.	SU	SU	SU
Section 5.4.5, Fisheries				
Impact 5.4.5-3: Effects on fishery resources.				
	Following implementation of the Calaveras Dam Replacement project (SV-2), operation of Calaveras Reservoir and the Alameda Creek Diversion Dam would be restored to pre-2002 conditions. A substantial increase in diversions from Alameda Creek to Calaveras Reservoir would reduce flows in this stretch of the creek, despite proposed bypass flows at the diversion dam. Diversion of most or all flows during late winter and spring months would reduce the ability of resident rainbow trout to spawn and for eggs to incubate; additional monitoring would be needed to determine the effectiveness of proposed bypass flows. In addition, the increased diversion of flows to the reservoir would divert fish from Alameda Creek to the reservoir, prevent fish passage to downstream reaches of the creek, and increase the potential for fish entrainment since there are currently no screens on the diversion.	PSM	PSM	PSM
Section 5.4.6, Terrestrial Biological Resources				
Impact 5.4.6-1: Impacts on riparian habitat and related biological resources in Calaveras Reservoir.				
▪ Sensitive habitats	Increased reservoir storage elevations would result in inundation and permanent loss of seasonal wetlands, seeps, perennial freshwater marsh, and riparian habitat that have established since 2002.	PSM	PSM	PSM
▪ Key special-status species	Since 2002, foothill yellow-legged frogs have occupied approximately 10,000 linear feet of stream channel along Arroyo Hondo between the maximum reservoir elevation mandated by the Division of Safety of Dams and the spillway elevation. Higher maintained reservoir levels would reduce the length of this high-quality habitat along the creek and adversely affect existing populations of foothill yellow-legged frog.	PSM	PSM	PSM
Impact 5.4.6-2: Effects on riparian habitat and related biological resources along Alameda Creek from below the diversion dam to the confluence with Calaveras Creek.				
▪ Key special-status species	A reduction in the frequency, duration, and magnitude of flows below the diversion dam would reduce the total available aquatic breeding habitat and food sources for California red-legged frog and foothill yellow-legged frog populations that currently occupy this reach of Alameda Creek.	PSM	PSM	PSM

TABLE 13.11 (Continued)
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – ALAMEDA CREEK WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Section 5.4.6, Terrestrial Biological Resources (cont.)				
Impact 5.4.6-3: Effects on riparian habitat and related biological resources along Calaveras Creek from Calaveras Reservoir to the confluence with Alameda Creek.				
▪ Key special-status species	Future outlet works at Calaveras Dam would have the capacity to make higher-volume releases than under existing conditions. Depending on the timing and volume of operational releases, they could adversely affect the reproductive success of special-status amphibian species along this reach (e.g., California red-legged frog and foothill yellow-legged frog).	PSM	PSM	PSM
Impact 5.4.6-4: Effects on riparian habitat and related biological resources along Alameda Creek from Calaveras Creek to San Antonio Creek.				
▪ Key special-status species	Depending on annual rainfall and localized site conditions along this creek segment, changes in winter and summer flows along this reach could result in both beneficial and adverse impacts on habitat for California red-legged frog and foothill yellow-legged frog populations.	PSM	PSM	PSM
Section 5.4.7, Recreational and Visual Resources				
Impact 5.4.7-1: Effects on recreation.				
	Operations under the WSIP would substantially reduce flows along Alameda Creek in the Sunol Regional Wilderness during winter and early spring months and adversely affect the recreational experience for hikers. *(Note: The Draft PEIR determined this impact to be PSM, but due to the change in the project description of the Calaveras Dam Replacement project (SV-2), this impact determination is revised to LS.)*	LS	LS	LS
Impact 5.4.7-2: Visual effects.				
	WSIP-induced reductions in stream flows along Alameda Creek would substantially change the quality of visual resources in the Sunol Regional Wilderness. *(Note: The Draft PEIR determined this impact to be PSM, but due to the change in the project description of the Calaveras Dam Replacement project (SV-2), this impact determination is revised to LS.)*	LS	LS	LS

LS = Less than Significant, no mitigation required
SM or PSM = Significant or Potentially Significant, can be Mitigated to less than significant
SU or PSU = Significant Unavoidable or Potentially Significant Unavoidable, cannot be mitigated to less than significant

[a] Under the Phased WSIP Variant through 2018, the SFPUC would limit the average annual SFPUC watershed deliveries to 265 mgd (approximately current levels).
[b] While the SFPUC would not make a decision about regional system deliveries for 2030 until 2018, for purposes of impact analysis a potential "worst-case" 2030 scenario was evaluated for the Phased WSIP Variant that assumes SFPUC watershed deliveries would increase after 2018 up to the 280 mgd level proposed under the Modified WSIP Alternative.

TABLE 13.12
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – PENINSULA WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Section 5.5.3, Surface Water Quality				
Impact 5.5.3-2: Water quality in Pilarcitos Reservoir and along Pilarcitos Creek.				
	Proposed operations would generally be within the same range as existing conditions, although replacement Measure 5.5.3-2a would cause Pilarcitos Reservoir to be drawn down earlier in the summer compared to existing conditions. Water temperature could increase and dissolved oxygen content could be reduced. *(Note: The Draft PEIR determined this impact to be PSM, and with the refined impact analysis for the Pilarcitos Creek watershed, this impact determination remains PSM due to impacts resulting from implementation of a replacement mitigation measure.)*	PSM	LS	PSM
	During dry years, summertime releases from Pilarcitos Reservoir to Pilarcitos Creek would be reduced to reservoir inflow at an earlier date than they are under the existing condition. This would increase the temperature of instream flows between Pilarcitos Creek and Stone Dam and reduce the creek's ability to support designated cold freshwater habitat along this reach.	PSM	LS	PSM
	During wet and above-normal years, the volume of spills over Stone Dam would be reduced compared to the existing condition.	LS	LS	LS
Section 5.5.5, Fisheries				
Impact 5.5.5-1: Effects on fishery resources in Crystal Springs Reservoir.				
	Elevated water levels in Crystal Springs Reservoir would inundate approximately 1,500 linear feet of trout spawning habitat upstream of the reservoir along Laguna and San Mateo Creeks.	PSU	PSU	PSU
Impact 5.5.5-4: Effects on fisheries resources in Pilarcitos Reservoir.				
	Proposed operations would be within the same range as existing conditions, although replacement Measure 5.5.3-2a would cause Pilarcitos Reservoir to be drawn down earlier in the summer compared to existing conditions. This would reduce the volume and quality of coldwater habitat available for resident fish species. *(Note: The Draft PEIR determined this impact to be PSM, and with the refined impact analysis for the Pilarcitos Creek watershed, this impact determination remains PSM due to impacts resulting from implementation of a replacement mitigation measure.)*	PSM	LS	PSM
Impact 5.5.5-5: Effects on fisheries resources along Pilarcitos Creek below Pilarcitos Reservoir.				
	Under the WSIP, the extended period of no or very little flow in Pilarcitos Creek below Pilarcitos Reservoir during summer months of dry years would result in significant impacts on resident trout, other resident fish species and aquatic resources, and habitat quality and availability for anadromous steelhead. Increased drawdown of Pilarcitos Reservoir would increase the temperature of releases in summer and fall and reduce the quality and availability of habitat for coldwater fish species.	PSM	LS	PSM

TABLE 13.12 (Continued)
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – PENINSULA WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
	A reduction in the frequency and magnitude of spills over Stone Dam would reduce flows along the lower reach. Reduced instream flows during winter months would adversely affect migratory fish habitat.	PSM	LS	PSM
Section 5.5.6, Terrestrial Biological Resources				
Impact 5.5.6-1: Impacts on biological resources in Upper and Lower Crystal Springs Reservoirs.				
▪ Sensitive habitats	Implementation of the Lower Crystal Springs Dam Improvements project (PN-4) would raise average monthly water levels in Crystal Springs Reservoir and result in a short-term reduction in the overall extent of freshwater marsh as the reservoir fills. Proposed changes in operations would maintain maximum reservoir levels during summer for longer periods than under existing conditions, which could affect the composition and structure of riparian habitats. In addition, sensitive upland habitats that are unable to tolerate these longer periods of inundation would be lost.	PSM	PSM	PSM
▪ Key special-status species	Elevated reservoir levels would inundate existing populations of special-status plant species, including serpentine-associated fountain thistle and Marin western flax, and their habitat could be permanently lost. The extent of available habitat for San Francisco garter snake and California red-legged frog would be temporarily reduced during reservoir refill, but wetland habitat that would establish at higher elevations could be more extensive. Raised reservoir levels would provide greater opportunities for largemouth bass and other predators to access frogs and snakes. Periodic drawdown during planned maintenance could adversely affect San Francisco garter snake foraging habitat.	PSM	PSM	PSM
▪ Other species of concern	Changes in wetland habitat due to reservoir refill and proposed operations would adversely affect reptile and bird species of concern, particularly if permanent changes in the composition of wetland vegetation occur. Permanent loss of upland habitat, including upland trees, grassland, and coastal scrub, would result in significant impacts on several bird and mammal species of concern. Serpentine- and grassland-associated plant species unable to tolerate extended periods of inundation would be lost.	PSM	PSM	PSM
▪ Common habitats and species	Due to the extent of area involved, impacts on common habitats and species would be significant.	PSM	PSM	PSM
Impact 5.5.6-4: Impacts on biological resources in Pilarcitos Reservoir.				
▪ Key special-status species	Proposed operations would be within the same range as existing conditions, although replacement Measure 5.5.3-2a would cause Pilarcitos Reservoir to be drawn down earlier in the summer compared to existing conditions. This would affect the extent of suitable habitat for California red-legged frog and San Francisco garter snake due to earlier reservoir drawdown in some years. Special-status species that utilize adjacent upland vegetation would not be affected. *(Note: The Draft PEIR determined this impact to be PSM, and with the refined impact analysis for the Pilarcitos Creek watershed, this impact remains PSM due to impacts resulting from implementation of a replacement mitigation measure.)*	PSM	LS	PSM

TABLE 13.12 (Continued)
SUMMARY OF SIGNIFICANT WATER SUPPLY AND SYSTEM OPERATIONS IMPACTS FOR PHASED WSIP VARIANT – PENINSULA WATERSHED

Impact	Impact Description	Proposed Program – 2030	Phased WSIP Variant – 2018[a]	Phased WSIP Variant – 2030 Scenario[b]
Impact 5.5.6-5: Impacts on biological resources along Pilarcitos Creek.				
▪ Sensitive habitats	In summer months of dry years, an extended period of no or little flow in Pilarcitos Creek between Pilarcitos Reservoir and Stone Dam could stress riparian vegetation, but existing vegetation appears to be adapted to periods of dryness. *(Note: The Draft PEIR determined this impact to be PSM, but due to the refined impact analysis for the Pilarcitos Creek watershed, this impact determination is revised to LS.)*	LS	LS	LS

LS = Less than Significant, no mitigation required
SM or PSM = Significant or Potentially Significant, can be Mitigated to less than significant
SU or PSU = Significant Unavoidable or Potentially Significant Unavoidable, cannot be mitigated to less than significant

[a] Under the Phased WSIP Variant through 2018, the SFPUC would limit the average annual SFPUC watershed deliveries to 265 mgd (approximately current levels).
[b] While the SFPUC would not make a decision about regional system deliveries for 2030 until 2018, for purposes of impact analysis a potential "worst-case" 2030 scenario was evaluated for the Phased WSIP Variant that assumes SFPUC watershed deliveries would increase after 2018 up to the 280 mgd level proposed under the Modified WSIP Alternative.

The WSIP would result in a reduction in the average annual volume of water released from O'Shaughnessy Dam and a change in the pattern of monthly and daily releases to the Tuolumne River below the dam (Draft PEIR, Vol. 3, Chapter 5, Section 5.3.1). The reduced release volume and altered flow regime would affect fisheries and terrestrial biological resources in the river below O'Shaughnessy Dam. Various quantitative factors or metrics were considered in determining the significance of the WSIP's impacts on fisheries and terrestrial biological resources. Several of the metrics relate to conditions in May, the month in which the effects of the WSIP would be the greatest in the reach of the river below O'Shaughnessy Dam. The following factors were evaluated over the 82-year hydrologic record:

- WSIP-caused reduction in average annual releases from O'Shaughnessy Dam
- Average WSIP-caused delay in May releases (in days)
- Maximum WSIP-caused delay in May releases (in days)
- Frequency of more than two-day delay in May releases caused by the WSIP
- Percentage reduction in May releases in all hydrologic years due to the WSIP
- Percentage reduction in May releases in dry years due to the WSIP
- Increase in the number of months when only minimum required releases are made as a result of the WSIP

These factors were considered together to arrive at significance conclusions with respect to the WSIP's impacts on fisheries and terrestrial biological resources in the Tuolumne River below O'Shaughnessy Dam, as shown in Table 13.10.

The WSIP would also result in a reduction in the average annual volume of water released from La Grange Dam and a change in the pattern of monthly and daily releases to the Tuolumne River below the dam. The reduced release volume and altered flow regime would affect fisheries and terrestrial biological resources in the river below La Grange Dam (see Vol. 3, Chapter 5, Section 5.3.1). A similar procedure (as was described above for the reach of the river below O'Shaughnessy Dam) was used to determine the significance of WSIP impacts on fisheries and terrestrial biological resources in the reach of the river below La Grange Dam. However, several of the metrics used in the analysis relate to conditions in June, because June is the month in which the effects of the WSIP would be greatest in this reach of the river.

Under the Phased WSIP Variant, while average annual deliveries from the SFPUC watersheds would be limited to 265 mgd such that there would be no increase in diversion from the Tuolumne River to serve additional demand, there would be a small increase in average annual Tuolumne River diversions of 2 mgd in order to implement the WSIP delivery and drought reliability elements for system customers through 2018. As a result of this small increase in average annual Tuolumne River diversion, like the WSIP, the Phased WSIP Variant with the 265 mgd delivery limitation from the SFPUC watersheds would result in a reduction in the average annual volume of water released from O'Shaughnessy Dam to the Tuolumne River, potentially affecting monthly and daily release patterns, (Vol. 3, Chapter 5, Section 5.3.1). Under the WSIP, the reduced volume and changed release pattern would have a potentially significant impact on

the terrestrial biological resources of streamside meadows and other alluvial features in the reach of the river between Hetch Hetchy and Don Pedro Reservoirs, particularly in the sensitive Poopenaut Valley (Vol. 3, Chapter 5, Section 5.3.6). Although flow changes would be much less with the Phased WSIP Variant through 2018 than with the WSIP, the impacts of the Phased WSIP Variant on terrestrial biological resources was still determined to be *potentially significant* because of the sensitivity of biological resources in the Poopenaut Valley. Accordingly, under the Phased WSIP Variant with the 265 mgd delivery limitation from the SFPUC watersheds, the SFPUC would still need to implement Mitigation Measure 5.3.7-2, Controlled Releases to Recharge Groundwater in Streamside Meadows and Other Alluvial Deposits (Vol. 4, Chapter 6, pp. 6-49 and 6-50) to reduce potentially significant impacts on biological resources.

As described in the previous paragraph, under the Phased WSIP Variant there would be a small increase in average annual diversions from the Tuolumne River of 2 mgd in order to implement the delivery and drought reliability elements of the WSIP through 2018. As a result, like the WSIP, the Phased WSIP Variant would result in a reduction in the average annual volume of water released from La Grange Dam to the Tuolumne River and a change in monthly and daily release patterns, although again, it would be a much smaller reduction. Under the WSIP, the reduced volume and changed release pattern would have a potentially significant adverse impact on fisheries and terrestrial biological resources in the Tuolumne River below La Grange Dam. Flow changes with the Phased WSIP Variant with the 265 mgd delivery limitation from the SFPUC watersheds would be much less than those under the WSIP, and the impacts of the Phased WSIP Variant on fisheries and terrestrial biological resources were determined to be less than significant. However, as previously discussed in the description of the Phased WSIP Variant, while the SFPUC proposes to limit average annual deliveries from its watersheds to 265 mgd (approximately the current level), it recognizes that it might be necessary to allow a short-term increase in watershed deliveries beyond 265 mgd (up to 275 mgd) while the SFPUC and/or BAWSCA and the wholesale customers implement the local conservation, recycled water, and groundwater projects needed to meet increasing demands through 2018. For the purpose of impact analysis, it was assumed conservatively that watershed deliveries could increase above 265 mgd for a few years until all of the local projects needed to generate the required 20 mgd of local supply and conservation have been fully implemented. In addition, a conservative, worst-case assumption of a short-term increase in watershed deliveries to 275 mgd was used. If the 265 mgd limit on watershed deliveries were exceeded, then there could be potentially significant impacts on the lower Tuolumne River during that time, until average annual diversions were reduced to 265 mgd (representing existing conditions). Although the impacts on the lower Tuolumne River would be of lesser magnitude than those of the WSIP (which assumed a watershed delivery level of 290 mgd) and would be temporary (on the order of a few years), the potential effects of the Phased WSIP Variant on fisheries and terrestrial biological resources in this reach of the river are conservatively considered to be *potentially significant*. The SFPUC would monitor annual water deliveries from its watersheds, and, if average annual deliveries from the SFPUC watersheds exceeded the 265 mgd limit, the SFPUC would implement Mitigation Measure 5.3.6-4a, Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water, or 5.3.6-4b, Fishery Habitat Enhancement and Measure 5.3.7-6, Lower Tuolumne River Riparian Habitat Enhancement. The SFPUC would continue to implement the necessary

measure(s) until the average annual SFPUC watershed deliveries are 265 mgd or less. Similar to the WSIP, implementation of Measure 5.3.6-4a is the preferred mitigation approach, and for the Phased WSIP Variant, the amount of conserved water required to reduce the impact to less than significant would be proportional to the amount of increased diversions from the Tuolumne River contributing to exceeding the 265 mgd restriction.

Alameda Creek Watershed

The significant impacts of the WSIP and the Phased WSIP Variant in the Alameda Creek watershed are shown in Table 13.11. The impacts of the Phased WSIP Variant, both with and without the 265 mgd limitation on SFPUC watershed deliveries, and the impacts of the WSIP would be the same or very similar. The reason the impacts in the Alameda Creek watershed would be the same or similar is that they would result primarily from facility improvements and restoration of the historical reservoir capacity at Calaveras Reservoir rather than from demand increases. Facility improvements would be the same for the WSIP and the Phased WSIP Variant.

Peninsula Watershed

The significant impacts of the WSIP and the Phased WSIP Variant in the Peninsula watershed are shown in Table 13.12. The impacts of the Phased WSIP Variant, both with and without the 265 mgd limitation on SFPUC watershed deliveries, and the impacts of the WSIP in the San Mateo Creek watershed would be the same or very similar. The reason the impacts in this watershed would be the same or similar is that they would result primarily from implementation of the facility improvement projects and restoration of Crystal Springs Reservoir capacity rather than from demand increases. Facility improvements would be the same for the WSIP and the Phased WSIP Variant.

With both the WSIP and the Phased WSIP Variant under the “worst-case” 2030 scenario (without the 265 mgd delivery limitation from the SFPUC watersheds), Pilarcitos Reservoir would be drawn down at an earlier date in some summers than it is under the existing condition (Vol. 3, Chapter 5, Section 5.5.1). As a result, releases to Pilarcitos Creek from the reservoir would be reduced to reservoir inflow earlier in the year than under the existing condition. The flow reduction in the creek between Pilarcitos Reservoir and Stone Dam would have a significant adverse impact on water quality and fisheries. In addition, under the WSIP and the 2030 Phased WSIP Variant scenario, the volume of wintertime spills over Stone Dam would be reduced compared to the existing condition. The reduction in the volume of spills would have an adverse impact on fisheries in Pilarcitos Creek below Stone Dam. These same phenomena would occur with the Phased WSIP Variant through 2018 with the 265 mgd delivery limitation, but their magnitude would be much less than with the WSIP. Consequently, the impacts of the Phased WSIP Variant through 2018 on water quality and fisheries in Pilarcitos Creek were determined to be less than significant. Under the Phased WSIP Variant through 2018, no mitigation measures would be needed in the Pilarcitos Creek watershed.

Secondary Effects of Growth

The Phased WSIP Variant would have the same growth-inducement potential through 2018 as the WSIP because the SFPUC (possibly with the cooperation of BAWSCA and the wholesale customers) would provide the additional water supply to meet 2018 purchase requests. However, depending on the decision on water supply in 2018, this variant could result in less growth inducement if the SFPUC decides to maintain the 265 mgd restriction on deliveries from the SFPUC watersheds, or on the high end, it could result in the same growth-inducement potential as the WSIP if it decides to fully meet a 2030 purchase request of 300 mgd. Similar to the WSIP, any growth-inducement increment attributable to this variant would be considered significant and unavoidable.

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