5.1 Introduction and Approach

CHAPTER 5
WSIP Water Supply and System Operations – Setting and Impacts

Chapter 5 Sections

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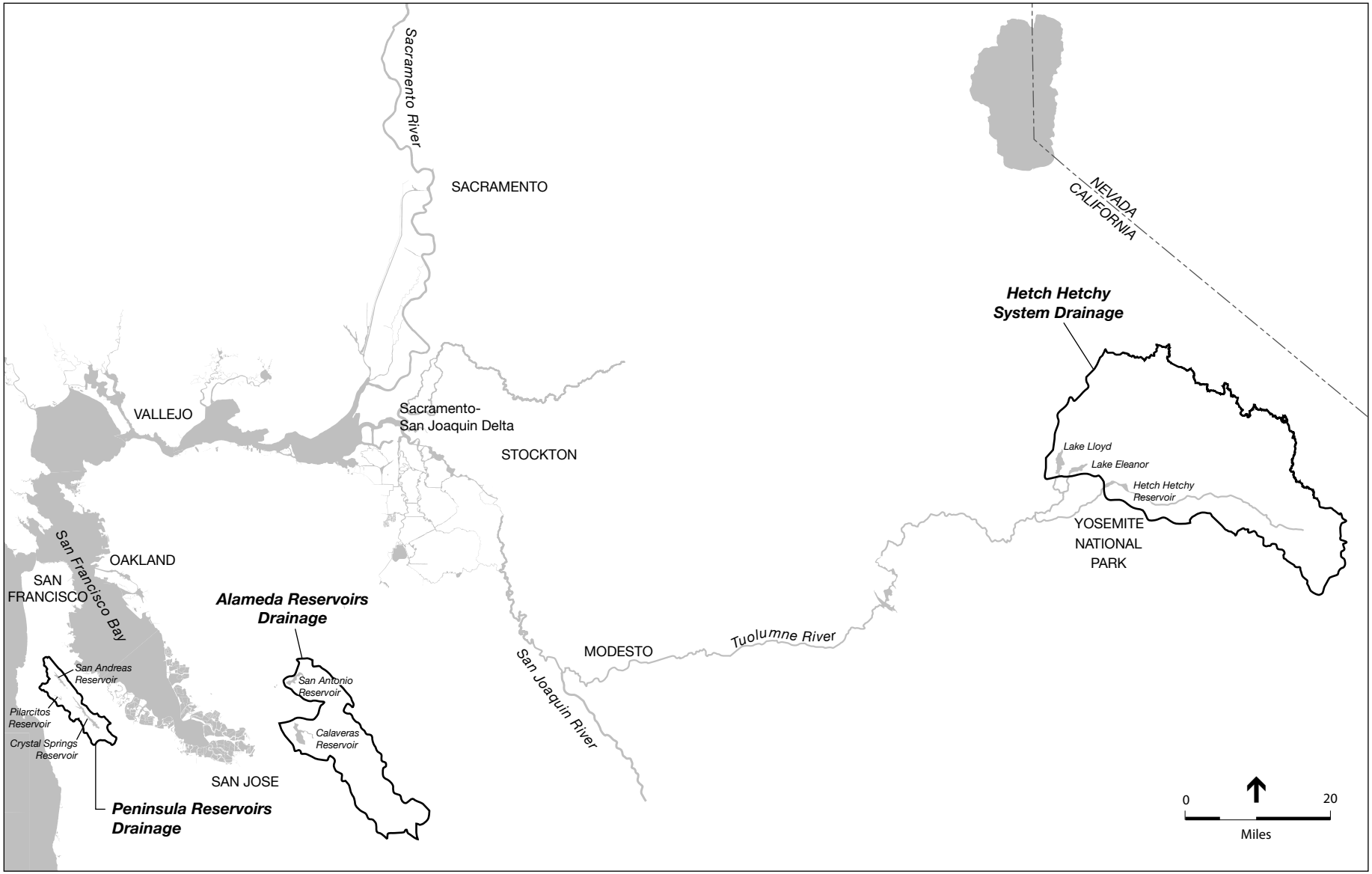
5.1 Overview

5.1.1 Introduction

This chapter addresses the water supply and system operations aspects of the Water System Improvement Program (WSIP) and evaluates the potential environmental impacts of the proposed changes in water supply sources and regional water system operations. These impacts are generally distinct from the impacts associated with proposed construction and operation of the WSIP facility improvement projects described in Chapter 4, although there are some areas of overlap, which are described where appropriate. Together, Chapters 4 and 5 of this Program Environmental Impact Report (PEIR) present the impacts associated with implementation of the San Francisco Public Utilities Commission's (SFPUC) proposed program.

The impact discussions in Chapter 5 are organized by watershed and related drainages and reservoirs, rather than by environmental resource topics as in Chapter 4. This is because the water supply and system impacts are dependent on the local characteristics of each watershed and related resources. In this chapter, each watershed or water resource is discussed as a whole. There are three watershed areas of interest along the SFPUC's regional system: the Tuolumne River system, the Alameda Creek system, and the Peninsula system (including Pilarcitos Creek) (see **Figure 5.1-1**). In addition, the Westside Groundwater Basin is analyzed as a separate resource area only with respect to WSIP impacts on the groundwater resources, since the facilities-related



SOURCE: ESA + Orion

SFPUC Water System Improvement Program . 203287

Figure 5.1-1
Overview of Water Supply Watersheds
in the SFPUC Regional Water System

effects of construction and operation of the WSIP groundwater projects are evaluated in Chapter 4. Together, these watersheds and related water resources constitute the "program area" affected by the proposed water supply and system operations of the WSIP (Chapter 4, Section 4.1 defines the "study area," which encompasses the areas affected by proposed WSIP facilities).

For each watershed and related drainage area, this chapter addresses impacts on all environmental resources that could be affected by the proposed water supply option and system operations included in the proposed program: surface water hydrology, geomorphology, water quality, groundwater, fisheries and aquatic resources, riparian resources, recreational and visual resources, and, where applicable, water supplies and energy. Other resource topic areas analyzed in Chapter 4—land use, geology/soils/seismicity, cultural resources, traffic/transportation/ circulation, air quality, noise/vibration, public services and utilities, agricultural resources, and hazards—are not addressed in Chapter 5, since these resource areas would not be affected by changes in water supply and system operations (see Appendix B for more discussion).

Chapter 5 provides a *project-level* impact analysis of implementing: (1) the proposed WSIP water supply option to serve the projected 2030 average annual customer water purchase requests of 300 million gallons per day (mgd), and (2) the future regional system operations associated with meeting the WSIP's water supply and delivery reliability level of service objectives. Specifically, Chapter 5 provides a detailed analysis of the effects of increasing the average annual diversion from the Tuolumne River to serve customer purchase requests during both nondrought and drought periods through 2030. The project-level analysis evaluates the effects on the hydrology and related resources in the Tuolumne River, Alameda Creek, and Peninsula watersheds. Project-level mitigation measures have been identified, where appropriate, to address potentially significant impacts.

This detailed analysis is intended to fully address the effects of implementing the proposed WSIP water supply option through 2030 without the need for additional environmental review, with one exception. The exception that will require additional CEQA review is associated with the effects of the WSIP facility improvement project, Groundwater Projects (SF-2), on groundwater resources. The analyses in Sections 5.3 through 5.5 include the project-level impacts of taking additional water from the Tuolumne River to provide potable water from the regional system during nondrought years to serve those customers in San Mateo County that currently use groundwater from the Westside Basin; however, Chapter 5 does not evaluate the project-level impacts on the Westside Groundwater Basin of extracting the water from the basin during drought years. Section 5.6 analyzes the effects of the proposed conjunctive-use program and local groundwater projects on groundwater resources at a program-level, and subsequent project-level impact analysis of the proposed groundwater extraction activities on groundwater resources will be required, as appropriate, as specific well facilities are proposed under the WSIP facility improvement project for Groundwater Projects (SF-2).[1]

[1] Chapter 4 analyzes the program-level effects of implementing facilities needed for the Groundwater Projects (SF-2) and Recycled Water Projects (SF-3), and separate, project-level CEQA review on those facilities will be required. The project-level analysis of the proposed water supply option in Chapter 5 includes the effects of incorporating recycled water into systemwide operations.

5.1.2 Chapter Organization

Chapter 5 is organized as follows. Section 5.1 provides a description of the WSIP water supply option and system operations analyzed in this chapter as well as a general discussion of the approach to the analysis and rationale used in the impact evaluation for all watersheds. It describes the modeling tool used in the analysis and the chief assumptions made regarding system operations in the future. Specific differences in approach that are unique to each watershed are described in the individual sections. In addition, this overview section presents the definitions of significance determinations used throughout the chapter.

Section 5.2 presents a review of the plans, policies, and regulatory framework as they apply to relevant water supply issues as well as to watershed management of affected resources. In addition, the general regulatory framework for water and biological resources is included in this section, and specific details applicable to each watershed are provided in subsequent sections.

Section 5.3 covers the Tuolumne River drainage from Hetch Hetchy Reservoir to the river's confluence with the San Joaquin River and, as appropriate, also discusses the Delta.

Section 5.4 addresses the portion of the Alameda Creek watershed and major tributaries where it would be affected by the regional water system.

Section 5.5 encompasses drainage areas within the SFPUC Peninsula watershed, including the watersheds of San Mateo, Pilarcitos, and San Andreas Creeks and associated reservoirs.

Section 5.6 discusses the Westside Groundwater Basin resources that could be affected by the proposed WSIP groundwater projects, including both the local project in San Francisco as well as the regional projects proposed as part of the conjunctive-use program.

Section 5.7 presents an analysis of cumulative effects associated with the water supply sources and related resources. The section describes other past, present, and reasonably foreseeable future projects that could affect the same water resources and related environmental resources as the WSIP (as described in Sections 5.3 through 5.6) and evaluates the potential cumulative effects of implementing the WSIP in combination with those projects.

5.1.3 Proposed Water Supply Option and System Operations

This section reiterates the description of the proposed water supply option, as presented in Chapter 3.0, since it is the focus of the Chapter 5 impact analysis. The proposed water supply option addresses both the delivery reliability and water supply levels of service proposed under the WSIP, which are both associated with the projected increase in customer purchase requests (demand) through the year 2030. The proposed delivery reliability level of service is to increase the reliability of the regional system to serve average day customer demand of 300 mgd under a range of operating conditions, including providing for local reservoir replenishment and during planned maintenance, unplanned outages, and loss of water from any one water source. The proposed water supply levels of service are as follows: (1) to fully meet customer purchase requests in nondrought years through the planning year 2030, estimated to be 300-mgd average

annual delivery, and (2) to provide drought-year delivery with a maximum systemwide cutback of 20 percent in any one year of a drought.

Although no major changes are proposed under the WSIP with respect to regional system operations, there would be some operational refinements (described in Chapter 3, Section 3.7). The proposed facility improvements would upgrade and in some cases expand the system, allowing changes in operations that provide increased flexibility as well as increased delivery reliability. In particular, local Bay Area reservoirs would be maintained at higher water levels for longer periods of time under the WSIP than under the existing condition. By keeping water stored in local reservoirs, geographically close to the customers' demand, the SFPUC would be able to respond to service needs during a drought or other emergency, such as an unplanned facility outage.

Proposed Nondrought-Year Water Supplies

During nondrought conditions, the SFPUC proposes to serve the increased 35 mgd in average annual purchase requests through a combination of conservation, water recycling, and groundwater supply programs in San Francisco supplemented with increased diversions from the Tuolumne River. Under the proposed water supply option, the SFPUC would implement conservation, water recycling, and groundwater supply programs in the SFPUC retail service area to achieve the equivalent of 10 mgd of supply in all years (drought and nondrought).

The SFPUC proposes to serve the increase in customer purchase requests that are not served by conservation, water recycling, and groundwater supply programs through increased use of Tuolumne River water under its existing water rights and additional management of the local watershed resources with the restoration of the storage capacity of Calaveras and Crystal Springs Reservoirs. The regional system would continue to maximize its use of local watershed water supplies. This increased diversions from the Tuolumne River include additional diversions needed to serve 2030 purchase requests as well as maintaining local storage for supply reliability and implementation of Westside Basin conjunctive-use program.

Proposed Drought-Year Water Supplies

During drought years under the WSIP, the SFPUC would continue to use the nondrought-year water supplies described above and would make use of the following additional resources and measures to meet the 2030 needs:

- *Water transfers*. Obtain up to an equivalent of 26 mgd of supplemental Tuolumne River water through water transfer agreements with TID and MID such that water would be available for diversion in drought years.

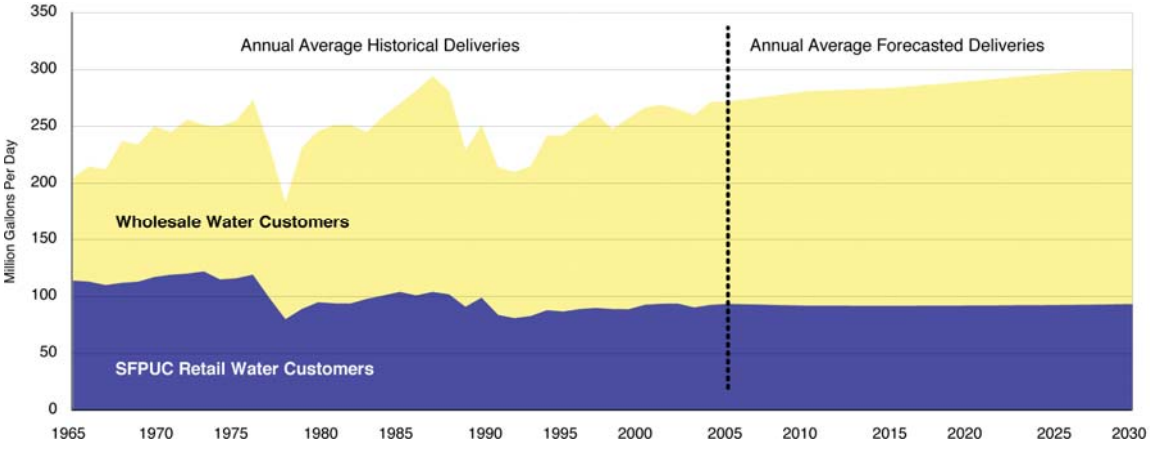
- *Groundwater conjunctive-use program in the Westside Basin, San Mateo County*. Utilize the extraction component of a groundwater conjunctive-use program in the Westside Groundwater Basin in northern San Mateo County to provide the equivalent of approximately 6 mgd of water during prolonged drought to groundwater pumpers. This includes providing potable water to groundwater pumpers and in-lieu groundwater recharge during nondrought years in return for reduced groundwater pumping during drought years.

- *Restoration of Calaveras and Crystal Springs Reservoir capacities*. Restore the historical operating storage capacities at Calaveras Reservoir to provide an equivalent of 7 mgd of additional water supply and at Crystal Springs Reservoir to provide an equivalent of 1 mgd of additional supply.

- *Rationing*. Implement up to 20 percent systemwide rationing if necessary in combination with use of the above supplemental water supplies.

To ensure that the water supplies would be available by 2030, the SFPUC is currently in the planning phase of the design and construction of needed facilities and is pursuing required agreements with other agencies. The SFPUC would secure these water supplies in phases as required to meet the increased customer demand between now and 2030, as reflected in **Figure 5.1-2**. Figure 5.1-2 shows the average annual historical customer deliveries as well as the projected future average annual demand. The figure indicates that between 2005 and 2030, the total customer purchase requests are estimated to increase by 35 mgd (annual average), from an annual average of 265 mgd to an annual average of 300 mgd. Retail customer demand would increase by about 1 mgd,[2] and the remaining increase would be from wholesale customers (see also Chapter 3, Table 3.4). Half of this increased demand is expected to occur before 2020, and the remaining by 2030.

This chapter evaluates the effects of implementing this proposed combination of actions and supplemental supplies to meet water supply and delivery needs and performance objectives through 2030.



SFPUC Water System Improvement Program ▪ 203287

SOURCE: SFPUC, 2007b

Figure 5.1-2 (Revised)
Annual Average Historical and
Projected Future Customer Purchase Requests

[2] The SFPUC retail service area high-range purchase estimate of 91 mgd assumes that San Francisco groundwater supply would be part of the regional water system supply.

5.1.4 Approach to the Analysis

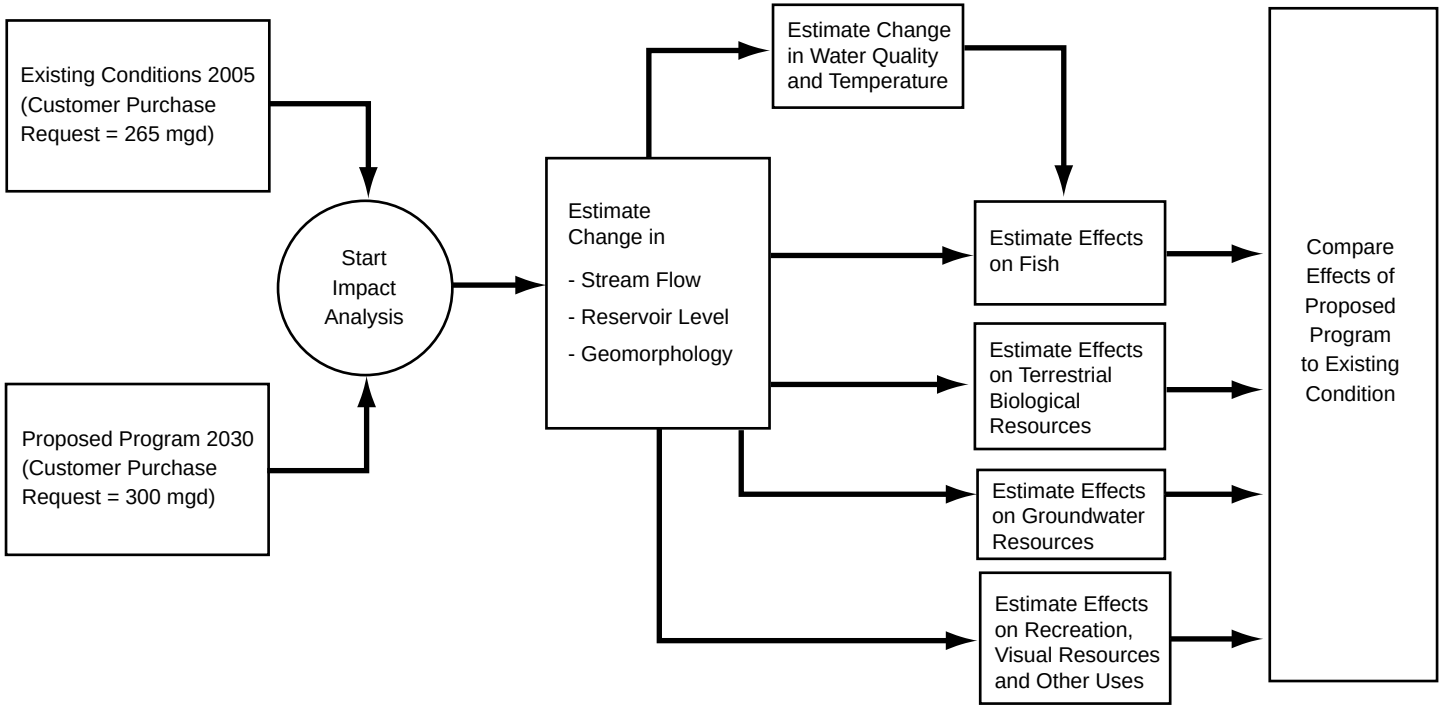
As part of WSIP implementation, additional water would be diverted from the Tuolumne River above the current average annual diversion levels in order to serve customer water delivery requirements and the other level of service goals established for the regional system through 2030. The analyses presented in Sections 5.3, 5.4, and 5.5 focus on the effects of this additional water diversion and of the related system operations needed to store and move that water from the Tuolumne River through the regional system of reservoirs and conveyance facilities to customers in the Bay Area. The analysis considers future system operations following implementation of all proposed WSIP projects in order to determine the effects that any adjustments in operations might have on the hydrology and related environmental resources in the three affected watersheds—the Tuolumne River, Alameda Creek, and Peninsula watersheds.

Relationship of Affected Resources

The basic approach to determining the potential impacts on water and related resources was the same for the three affected watersheds. First, changes in flow in the rivers and/or creeks and changes in water levels in each of the reservoirs were evaluated. These are the primary physical environmental changes that could occur with implementation of the water supply component of the WSIP, and these changes provide the basis for evaluating the potential related effects on other environmental resources. **Figure 5.1-3** depicts the interrelationships between, and among, changes in stream flow and reservoir storage levels and the potentially affected environmental resources.

Changes in stream flow under to the WSIP, which would primarily result from changes in the timing and quantity of water released from system reservoirs, were used to assess changes in the geomorphic processes for local streams (i.e., the sediment transport and channel-forming properties that define the nature of a stream course and its associated habitats). Stream flow and reservoir water level changes were then used to estimate changes in water quality. The chief water quality parameters that could be affected by changes in stream flow and reservoir levels are temperature and dissolved oxygen, and these parameters are the focus of the water quality analysis. The combination of changes in flow, reservoir levels, and water quality was then used to determine potential impacts on fisheries resources. Changes in flow and reservoir levels were also used to identify potential impacts on riparian habitat and related terrestrial biological resources. Finally, changes in flow and reservoir levels were used to identify potential impacts on water-related recreation, including whitewater rafting, boating, and fishing, and water-related visual resources. For the Tuolumne River watershed, the changes in flow and reservoir levels were also used to identify potential effects on downstream users and on energy supplies due to potential changes in hydropower generation.

The SFPUC operates and manages the regional water system (including the Tuolumne River system, the Alameda Creek system, and the Peninsula watershed system) in accordance with a complex and dynamic set of operational procedures that respond to changing climatic and hydrologic conditions, legal and regulatory requirements, water supply demands, and needs for maintenance, repair, and replacement of system facilities. In order to assess the changes to these systems that could occur under the WSIP, it was necessary to employ a computer modeling tool



SOURCE: ESA + Orion

Figure 5.1-3
Approach to Impact Analysis on Water Resources

with the capability of addressing the many factors involved in system operations and management and thus enabling a comparison of the "before" and "after" program conditions. The modeling tool and approach used for analysis are described in the following section.

Hetch Hetchy/Local Simulation Model

The amount of water available to the SFPUC varies from year-to-year depending on meteorological conditions, water rights, and statutory and contractual obligations, including the Raker Act. The SFPUC operates its water system to meet customer water demand as fully and efficiently as it can, despite the fact that the amount of water available to it varies from year-to-year. The operations of the water system are complex, involving numerous reservoirs, pipelines, and pumping plants. The SFPUC utilizes a computerized mathematical model to assist in the evaluation of its water systems operations—the Hetch Hetchy/Local Simulation Model (HH/LSM), a water supply planning model (SFPUC, 2007a). This model is the best available tool for depicting the overall regional water system operations under a range of conditions and is similar to the models used by other water purveyors in the United States to depict their water system operations and to plan for system improvements.

A general overview of this modeling tool and the basic assumptions about the system included in the model are described in this section. **Appendix H1** provides a more detailed description of the model and how it was used for the PEIR water supply and system operations impact analysis; **Appendix H2** provides supporting details and an explanation of the 2007 raw data output from the model.

Following publication of the Draft PEIR, the SFPUC conducted updated model runs in 2008 using more recent input assumptions for several model parameters as part of its ongoing system planning and management. The revised input assumptions included: adjusted capacity for Crystal Springs Reservoir from 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 Modesto and Turlock Irrigation Districts service area to be consistent with data used in recent statewide planning documents; and a refinement of 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 analysis, and that the analyses and impact determinations presented in the Draft PEIR remain valid. With one exception, no changes in the impact approach, analysis or conclusions presented in the Draft PEIR are necessary for the water supply and system operations impact assessments that were based on the 2007 results. The sole exception is the approach to the impact analysis of 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. The results of the refined impact analysis for the Pilarcitos watershed are summarized in Chapter 13 (Section 13.3, pp. 13-6 to 13-7).

[The updated HH/LSM Assumptions and Results were included as an appendix to the Comments and Responses document. Please refer to Appendix O (Vol. 8).]

Representation of the Regional System in the Model

The HH/LSM incorporates detailed information about key aspects of the SFPUC regional water system, including facilities (i.e., reservoir and conveyance capacities) and operating procedures and "rules" that determine how and when water is moved through the system to customers. The operating procedures include responses to seasonal variation in demand, allocation of demand to customer groups, and procedures to maximize the use of local watershed supplies, while the rules include responses to regulatory requirements for instream flows and compliance with Raker Act obligations. As described in Chapters 2 and 3, water system operations can be generally delineated between rules and strategies affecting the operation of the Bay Area water system and rules and strategies affecting the operation of the Hetch Hetchy system. Although generally discussed separately, the two systems are integrally linked and are interdependent on each other in order to maximize water availability and quality.

For the Hetch Hetchy system, the HH/LSM integrates operations at SFPUC's three major reservoirs in the Tuolumne River watershed—Hetch Hetchy Reservoir, Lake Lloyd, and Lake Eleanor—with the operation of TID/MID's Don Pedro Reservoir, due to the SFPUC's water bank account in Don Pedro Reservoir (described in Chapter 2, Section 2.5.2). The operation of these reservoirs and the water bank account is guided by two primary objectives: (1) to conserve reservoir storage so as to optimize supply to SFPUC customers, and (2) to fulfill San Francisco's Raker Act obligation to bypass Tuolumne River flow to TID and MID. Underlying the operations at the SFPUC's reservoirs are the minimum fishery release requirements prescribed for Hetch

Hetchy Reservoir, Lake Lloyd, and Lake Eleanor. Water that is released from San Francisco's reservoirs and not diverted to SFPUC customers, together with runoff that originates below San Francisco's reservoirs, flows to Don Pedro Reservoir. The HH/LSM simulates TID/MID's operation of Don Pedro Reservoir, including simulation of canal diversions, flood control operations, and releases to meet fishery release requirements below La Grange Dam. The model also simulates the accounting for the SFPUC's water bank account.

The model uses a watershed runoff forecasting routine (for snowmelt and rainfall) that projects the amount of runoff that can be expected to flow into each reservoir for a particular time period. Once the amount of runoff is projected, this amount is compared to the availability of reservoir storage and the anticipated releases required from the reservoir to meet downstream flow requirements and the diversions needed for water deliveries to SFPUC customers. If a reservoir is projected to spill, the model incorporates discretionary releases that the SFPUC manages to enhance hydropower generation. The model uses a monthly time step. This forecasting and decision process occurs sequentially each month of the period being modeled.

For the local Bay area system, the model depicts the regional system as a linked series of inflows, reservoirs, conveyance routes, and areas of water demand. Numerous operational constraints are incorporated, including considerations for downstream channel conveyance capacity, treatment plant capacity, and water transmission capacity. The Bay Area system is operated to maximize the efficient use of local Bay Area watershed runoff and supplemented with Tuolumne River water resources. The model establishes optimal storage levels for each Bay Area reservoir by season; this relates to how the SFPUC manages reservoir storage levels to lower reservoir storage space prior to the rainy season and then to raise the level through the dry season. In San Antonio, Crystal Springs, and San Andreas Reservoirs, the model assumes that reservoir space is filled first with Bay Area watershed runoff and then supplemented with Tuolumne River water by late spring in order to ensure maximum local reservoir storage through the summer season.

Simulation of System Operations

Simulation Period

The model simulates system operations over the course of an 82-year sequential hydrologic period from July 1920 through September 2002. The model includes actual, measured historical information about the hydrology (the amount of runoff estimated from either snowmelt and/or rainfall) that occurred in each year over the 82-year record for each of the three watershed areas under consideration: the Tuolumne River system, the Alameda Creek system, and the Peninsula watershed system. This 82-year period includes many different types and sequences of actual hydrological events, ranging from flood events to droughts of different magnitude and duration. Because natural surface water systems are dynamic and runoff and flow vary each year, and as it is not possible to predict future precipitation, it is a necessary and standard industry practice to use a long-term historical record to represent the range of hydrologic conditions that can be expected in the future. The long-term 82-year historical record is used in the model to represent the range of hydrologic conditions that could occur in the future[3] and to assess both how the

[3] The potential effect of climate change on the SFPUC's regional system is addressed in Section 5.7 under Cumulative Impacts.

system would perform in terms of meeting the WSIP level of service objectives and what types of impacts the program might have under a range of conditions.

The modeling tool uses information on actual historical hydrology but does not "predict" or necessarily precisely depict the past, historical operation of the system. The historical operation of the system in an actual year will differ from the operations simulated by the model for that year as a result of day-to-day adjustments made by the system operators, who constantly modify operations throughout the year to respond to changing conditions related to weather, demand, water quality, or facilities conditions (e.g., maintenance or unplanned facilities outages). While many of these factors are built into the model, the model cannot account for all the actual operations and adjustments made throughout each year. The objective of using the modeling tool is to assess the effect of system changes on future operations over a broad range of realistic hydrologic conditions.

Hydrologic Year Definitions

As described in detail in Appendix H1, all years in the 82 years of historical hydrology were ranked and grouped into hydrologic year types according to river and creek flow. Five hydrologic categories were used to depict the range of wet to dry years, depending on the hydrologic index. The hydrologic year types are defined differently for different watershed and drainage areas affected by the WSIP (referred to as the hydrologic index) in order to accurately reflect each area's unique hydrology. A hydrologic year is from October to September.

Hydrologic year types for the Tuolumne River above Don Pedro Reservoir are classified based on the SFPUC's calculation of unimpaired flow[4] for the Tuolumne River at La Grange. The 20 percent of years when unimpaired inflow to Don Pedro Reservoir was lowest were designated as dry years; the next driest 20 percent of years were designated as below-normal years, and so on. This index uses the following year types: wet, above normal, normal, below normal, and dry.

Hydrologic year types for the Tuolumne River below La Grange Dam are classified according to the California Department of Water Resources' San Joaquin River Index, which defines the following categories: wet, above normal, below normal, dry, and critically dry. This index was used to analyze Don Pedro Reservoir operations because release requirements from Don Pedro Reservoir at La Grange Dam are tied to this index.

Hydrologic year types for the Alameda Creek and Peninsula watersheds are also classified by the 20 percent grouping technique and are based on the SFPUC's estimation of local inflow into its five San Francisco Bay Area reservoirs. Annual flow into each of the reservoirs was summed for each water year. The 20 percent of years when total runoff into the five reservoirs was lowest were designated dry years. The next driest 20 percent of years were designated below-normal years, and so on. This index uses the following year types: wet, above normal, normal, below normal, and dry.

[4] The natural river flow that existed prior to the placement of upstream water diversions, storage reservoirs, or other impediments.

Model Assumptions and Output

The model evaluates system operations, performance, and effects on reservoir storage and reservoir releases (i.e., streamflow below the dam) under a given set of operating parameters utilizing the 82 years of historical hydrology. A differing set of operational objectives and/or a change in the physical configuration of the water system could result in different operations, system performance, and effects on reservoir storage and releases. The model is used to compare alternative operational objectives and system configurations. For the impact analysis presented in this chapter, the model was employed to simulate operations and the effects of those operations under an existing conditions scenario (2005) and under a WSIP scenario (2030).

Model Assumptions and Inputs

The model uses input information on key aspects of the regional water system, including the level of annual water delivery provided by the system, the maximum rationing to be allowed during a drought, and the state of the facilities (e.g., reservoir and conveyance capacities and configurations). **Table 5.1-1** summarizes the differences in key assumptions between the existing conditions and WSIP scenarios that were incorporated into the model and used in the CEQA impact analysis.

TABLE 5.1-1
MODELING ASSUMPTIONS USED IN THE CEQA ANALYSIS

Parameter	Existing Conditions Scenario	WSIP Scenario
Planning year	2005	2030
Customer purchase requests (average annual delivery) (mgd)	265 mgd	300 mgd
Average annual demand from regional system water supply sources (Tuolumne River and local watersheds)	265 mgd	290 mgd
Average annual delivery from other sources (recycled water, groundwater, conservation)	See note a	10 mgd[b]
System firm yield[c]	219 mgd	256 mgd
Maximum systemwide rationing during a drought	No policy cap – up to 25%	20%
WSIP facility improvement projects	None	All WSIP projects

[a] San Francisco and many of its retail and wholesale customers currently utilize recycled water, groundwater, and/or conservation practices to some extent, which is reflected in the 265 mgd average annual delivery.

[b] The 10 mgd reflects proposed implementation of recycled water, groundwater, and conservation projects in San Francisco to benefit the regional water system.

[c] System firm yield is defined as the average annual water delivery that can be sustained by the regional water system during an extended drought. The SFPUC uses an 8.5-year design drought for planning purposes. Due to the 2001 DSOD operational restrictions on Calaveras Dam, the system firm yield was 219 mgd as of September 2005, when the NOP for the PEIR was published. Normal system firm yield is 226 mgd, which reflects Calaveras Reservoir operating at its historical capacity.

The existing conditions scenario reflects the key information about the system for the year 2005, in accordance with CEQA guidance on the appropriate timeframe for determining the environmental baseline to be used for impact analysis.[5] The average annual water delivery from the regional system for the base year was 265 mgd. The existing conditions (2005) scenario reflects the regional system facilities as they were in 2005 (and remain today), including the restricted capacity at both Calaveras and Crystal Springs Reservoirs.

As described in Chapter 2, Section 2.2, the California Department of Water Resources, Division of Safety of Dams (DSOD) imposed operational restrictions on Calaveras Reservoir storage capacity in December 2001, which reduced the reservoir's normal capacity of 96,850 acre-feet to approximately 37,800 acre-feet. Prior to the DSOD restriction, Calaveras Reservoir had been operated at its full capacity for over 70 years (since completion of the Alameda Creek Diversion Dam and Tunnel in 1931). As a result of this restricted capacity, the SFPUC has had to significantly reduce its diversions through the Alameda Creek Diversion Dam compared to its 70 -year-long historical operations. The current capacity restriction will remain in effect—and thus the storage capacity will continue to be limited—until such time that the Calaveras Dam Replacement project (SV-2) is implemented. This project is scheduled for completion in 2012, at which time the restricted reservoir capacity will have been part of system operations for approximately 10 years. In order to present the most consistent baseline condition under CEQA, this PEIR uses an existing conditions scenario that reflects the current restriction on Calaveras Reservoir capacity, despite the fact that the reservoir had been operating at full capacity for 70 years. Implementation of the WSIP (specifically the Calaveras Dam Replacement project) would result in a change to these current operating conditions, restoring them in large part to conditions similar to the prior 70 years of operation. This PEIR examines the potential impacts of these changes.

The capacity of Crystal Springs Reservoir has been restricted since 1983 (also described in Chapter 2, Section 2.2.5); therefore, for this reservoir as well, an existing conditions scenario with restricted capacity is assumed, in compliance with CEQA.

As shown on Table 5.1-1, for the WSIP (2030) scenario, the model incorporates information about the expected average annual water delivery from the regional system in 2030, which under the WSIP is proposed to be 290 mgd. The other 10 mgd of supply needed to serve the total 2030 average annual customer purchase requests of 300 mgd is proposed to come from a combination of recycled water, groundwater, and conservation projects in San Francisco, to be implemented as part of the WSIP. The WSIP (2030) scenario also assumes that all proposed facility improvement projects have been fully implemented. This scenario thus includes the restoration of full storage capacity at Calaveras Reservoir and Crystal Springs Reservoir.

[5] CEQA Guidelines Section 15125(a) states that an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation (NOP) is published, and that this environmental setting will normally constitute the baseline physical conditions against which the lead agency determines whether an impact is significant. The NOP for the WSIP PEIR was published in September 2005.

In addition to the input assumptions shown in Table 5.1-1, the model includes, for both the existing condition and WSIP scenarios, the same assumptions and rules for compliance with statutory and contractual obligations, including the Raker Act and minimum instream flow requirements.

Model Outputs

Once the operation of the regional water system was modeled under each scenario, the model provided output information about system performance under that scenario in terms of the WSIP system objectives and about the timing and amount of water in reservoir storage and released from the system reservoirs downstream. In general, the model provides information on a monthly basis. **Table 5.1-2** summarizes key output information provided by the model.

During actual system operations, operators make decisions about how much water to retain in storage and how much water to release from system reservoirs on an hourly, daily, or weekly basis in response to changing conditions. The model does not report these changes at this level of detail. Like other computer models used elsewhere in California to predict the impacts of proposed projects on complex water storage and delivery systems (e.g., the Central Valley Project and State Water Project), the HH/LSM identifies monthly levels in various storage facilities and water bodies, and does not have the necessary precision to deal with hourly, daily, or weekly operational decisions. The state of the art in modeling has not yet reached the point where such precision is possible. In most cases, however, the monthly information about changes in reservoir storage and reservoir releases downstream was adequate for the purpose of assessing the nature, magnitude, and frequency of potential physical changes and environmental impacts associated with operations under the proposed WSIP program scenario compared to the existing condition. In those cases where more detailed information is needed for impact analysis than is available from monthly data, the SFPUC system operators were consulted about daily or weekly operations and, where available, historical data on the system operation were reviewed. Thus, in these instances, the conclusions set forth in the PEIR reflect not only the results of the HH/LSM, but also input from the experienced system operators regarding how they would likely respond to the kinds of issues that might arise on a daily a weekly basis.

Model Limitations

The HH/LSM is the best available tool for depicting changes in the overall regional water system operations; however, as explained above and further explained here, in some cases, limitations inherent in the model required that the analysis be supplemented by additional data.

[Paragraph has been deleted per responses to comments or staff-initiated text changes (Vol. 7, Chapter 16).]

TABLE 5.1-2
HH/LSM OUTPUT PARAMETERS
(Data provided as monthly time step for 82 years of historical hydrology)

Feature	Output Parameter
TUOLUMNE RIVER SYSTEM	
Unimpaired Inflow (acre-feet)	Inflow to Hetch Hetchy Reservoir
	Inflow to Lake Lloyd
	Inflow to Lake Eleanor
	Unregulated Flow below Hetch Hetchy Reservoir
End-of-Month Storage (acre-feet)	Hetch Hetchy Reservoir Storage
	Lake Lloyd Storage
	Lake Eleanor Storage
	Don Pedro Water Bank Account Storage
	Don Pedro Reservoir Storage
	Total Up-Country Reservoir Storage
	Total Hetch Hetchy System Storage
Releases (acre-feet)	Hetch Hetchy Reservoir Release to Stream
	Hetch Hetchy Reservoir Release to Canyon Tunnel
	Lake Lloyd Release to Stream
	Lake Lloyd Release to Holm Powerhouse
	Lake Eleanor Release to Stream
	Lake Eleanor Tunnel to Lake Lloyd
Evaporation (acre-feet)	Hetch Hetchy Reservoir
	Lake Lloyd
	Lake Eleanor
San Joaquin Pipeline (acre-feet)	SJPL Flow from Lower Cherry Aqueduct
	Total SJPL
Precipitation (inches)	Hetch Hetchy Precipitation – Accumulated
Power Production (MWh)	Moccasin Powerhouse
	Kirkwood Powerhouse
	Holm Powerhouse
	Total
Unimpaired Runoff (acre-feet)	Unimpaired Runoff at La Grange Dam
	TID, MID, and SFPUC Rights and Entitlements
	Unimpaired Runoff Available to San Francisco
Don Pedro Operations (acre-feet)	Inflow
	Storage
	Don Pedro Reservoir Flood Control Limit
	Don Pedro Reservoir Evaporation (San Francisco)
	Total Don Pedro Reservoir Evaporation
	Don Pedro Reservoir Power – MWh
	Total MID Diversion at La Grange Dam
	Total TID Diversion at La Grange Dam
	La Grange Minimum Release Requirement
	Total La Grange Dam Release to River
	Total Release from Don Pedro Reservoir
Water Bank Account (acre-feet)	Water Bank Account Balance
	Water Bank Account Maximum
	Transfer to Water Bank Account
Miscellaneous	SFPUC Shortage Level
	Hetch Hetchy Minimum Stream Release (acre-feet)
LOCAL SYSTEM (ALAMEDA CREEK AND PENINSULA WATERSHEDS)	
Calaveras (MG)	Calaveras Reservoir Storage
	Calaveras Reservoir Inflow from Arroyo Hondo
	Calaveras Reservoir Inflow from Upper Alameda Creek
	Calaveras Reservoir Release to San Antonio Reservoir
	Calaveras Reservoir Release to Sunol Valley WTP
	Calaveras Reservoir Release to Calaveras Creek
	Calaveras Reservoir Spill to Calaveras Creek
	Calaveras Reservoir Evaporation

TABLE 5.1.2 (Continued)
HH/LSM OUTPUT PARAMETERS
(Data provided as monthly time step for 82 years of historical hydrology)

Feature	Output Parameter
San Antonio (MG)	San Antonio Reservoir Storage
	San Antonio Reservoir Inflow from San Antonio Creek
	San Antonio Reservoir Inflow from Calaveras Reservoir/SJPL
	San Antonio Reservoir Release to Sunol Valley WTP
	San Antonio Reservoir Release to San Antonio Creek
	San Antonio Reservoir Evaporation
Crystal Springs (MG)	Crystal Springs Reservoir Storage
	Crystal Springs Reservoir Inflow from San Mateo Creek
	Crystal Springs Reservoir Inflow from San Andreas Reservoir
	Crystal Springs Reservoir Inflow from Bay Division Pipelines
	Crystal Springs Reservoir Pumping to San Andreas Reservoir
	Crystal Springs Reservoir Pumping to Coastside CWD
	Crystal Springs Reservoir Release to San Mateo Creek
	Crystal Springs Reservoir Spill to San Mateo Creek
	Crystal Springs Reservoir Evaporation
San Andreas (MG)	San Andreas Reservoir Storage
	San Andreas Reservoir Inflow from Watershed
	San Andreas Reservoir Inflow from Crystal Springs, San Mateo Creek & Pilarcitos
	San Andreas Reservoir Release to Harry Tracy WTP
	San Andreas Reservoir Release to San Mateo Creek
	San Andreas Reservoir Spill to San Mateo Creek
	San Andreas Reservoir Evaporation
Pilarcitos (MG)	Pilarcitos Reservoir Storage
	Pilarcitos Reservoir Inflow
	Pilarcitos Reservoir Release to San Andreas Reservoir
	Pilarcitos Reservoir Release for Stone Dam Diversion to Coastside CWD
	Pilarcitos Reservoir Pre-Release to Pilarcitos Creek
	Pilarcitos Reservoir Spill to Pilarcitos Creek
	Pilarcitos Reservoir Evaporation
Stone Dam (MG)	Stone Dam Inflow (Accretion)
	Stone Dam Release to Coastside CWD
	Stone Dam Release to Crystal Springs Reservoir
Reservoir Storage (MG)	Total Reservoir Storage – East Bay
	Total Reservoir Storage – Peninsula
	Total Local Storage
	Maximum Targeted Total Local Storage
Demand (MGD)	Delivery to South Bay Demand Center
	Delivery to Crystal Springs Demand Center
	Delivery to San Andreas Demand Center
	Delivery to In-City Demand Center
	Total Delivery to Demand Centers (not including Coastside CWD)
Demand (MG)	Delivery to South Bay Demand Center
	Delivery to Crystal Springs Demand Center
	Delivery to San Andreas Demand Center
	Delivery to In-City Demand Center
	Total Delivery to Demand Centers (not including Coastside CWD)
San Joaquin Pipelines	SJPL Flow – MG
	SJPL Flow – MGD
SJPL (MG)	SJPL Flow to Crystal Springs Reservoir – MG
	SJPL Flow to San Antonio Reservoir – MG
West Basin Reservoir (MG)	Beginning of Month Storage
	West Basin Reservoir – Input Resulting from San Andreas Gradient Deliveries
	West Basin Reservoir – Input Resulting from Crystal Springs Gradient Deliveries
	End of Month Storage
Desalination Project (MG)	Input from Desalination Project
Treatment Plant Delivery (MGD)	Calaveras Reservoir Flow to Sunol Valley WTP
	San Antonio Reservoir Flow to Sunol Valley WTP
	Sunol Valley WTP Production
	Harry Tracy WTP Production

Indicates data used in the PEIR analysis

Coastside CWD = Coastside County Water District; MG = million gallons; MGD = million gallons per day; MWh = megawatt-hours; MID = Modesto Irrigation District; SJPL = San Joaquin Pipelines; TID = Turlock Irrigation District; WTP = water treatment plant.

The HH/LSM was used to estimate baseline and with-WSIP flows in the Tuolumne River, Alameda Creek, and Pilarcitos Creek. However, the model results were not solely relied upon when evaluating flows in creeks immediately downstream of SFPUC reservoirs that normally have minimal flow or are affected by SFPUC operations for time periods less than a month in duration. This is because the model uses a monthly time interval. The model does not simulate day-to-day variations in water levels or releases to a stream, but instead provides an average water level and an average release in a given month. The inability of the model to illustrate short-term variations is generally not problematic when simulating continuous phenomena like storage or water level in a reservoir or flow in a perennial stream. However, in some cases, the modeling limitation of only providing information at a monthly time interval required additional considerations, such as SFPUC operator experience and knowledge, when simulating intermittent phenomena such as infrequent spills or releases from reservoirs that may last only a few days.

Flow in San Mateo Creek downstream of Lower Crystal Springs Dam provides an example. The SFPUC system operators rarely release water from Crystal Springs Reservoir to San Mateo Creek, and flow in the creek below the dam typically occurs only from seepage from the dam and groundwater infiltration. The SFPUC operators attempt to capture and retain as much runoff as possible from the upper San Mateo Creek watershed in Crystal Springs Reservoir. In all but wet years, the SFPUC captures all of the runoff from the upper watershed. In wet months of wet years, the operators of the reservoir obtain frequent weather forecasts and manage the reservoir to capture as much runoff as possible from the sequence of winter storms that cross the watershed. The operator's decisions with respect to reservoir management are made on a day-to-day, sometimes hour-to-hour, basis. In certain circumstances during wet hydrologic conditions, the operators must release water from the reservoir to the creek due to unpredictable weather conditions and their limited ability to make further adjustments to reservoir levels and other systemwide operations. Releases from Crystal Springs Reservoir to San Mateo Creek are based on day-to-day changes in operations and thus cannot be modeled using the HH/LSM. Consequently, the model does not provide a refined prediction of the magnitude and timing of infrequent and short-term releases from the reservoir. Similarly, the model does not provide a precise prediction of the magnitude and timing of releases from San Antonio Reservoir and flow in San Antonio Creek downstream of the reservoir. However, HH/LSM results are sufficient to depict the general trends of WSIP effects on these parameters on a monthly basis.

For the reasons noted above, HH/LSM results were not used to predict the magnitude and timing of spills or releases from Crystal Springs and San Antonio Reservoirs. In addition, HH/LSM results were not used to predict the magnitude and timing of spills or releases from Crystal Springs Reservoir. In these cases, the likely effects of the WSIP were determined through a review of historical data and consultation with individuals knowledgeable about the past and predicted future reservoir operating practices as well as output from the updated 2008 HH/LSM results.

In additional instances, such as the analyses of flow effects below Hetch Hetchy Reservoir and below the Alameda Creek Diversion Dam, HH/LSM results were refined or tiered to provide additional insight into the effects of the WSIP on stream flow for time periods of less than a month.

[Additional discussion on water resources modeling was prepared as part of the Comments and Responses document. Please refer to Section 13.3, Updated Water System Assumptions and Modeling (Vol. 7, Chapter 13), and Section 14.5, Master Response on Water Resources Modeling (Vol. 7, Chapter 14).]

Use of Model Results to Show Water Supply Sources

Figures 5.1-4 and **5.1-5** present model results showing the relative contributions of the various water supply sources to the regional system for the 82-year period of hydrologic record under existing conditions (2005) and WSIP conditions (2030), respectively. The figures illustrate the combination of supply sources the regional system would use year-to-year to serve customer deliveries if it were operated over a series of years similar in terms of climate conditions to those that occurred from 1920 to 2002 under the two scenarios. The figures depict how relative contributions of water supply sources available to the SFPUC would vary from year to year and show the frequency and extent of shortages and rationing that would occur if there were dry years and drought sequences similar to those that occurred during this period.

The figures indicate that there currently is, and would continue to be, a wide annual variation in the amount of water available from the various water sources under both current and future conditions. This, in turn, results in a wide variation in the changes in stream flow and reservoir water levels that would occur under the WSIP compared to the existing condition. Therefore, the impact analysis presented in this chapter addresses the effects of this range of variation in stream flow and reservoir level changes on the potentially affected watersheds and associated resources.

5.1.5 Impact Significance Determinations

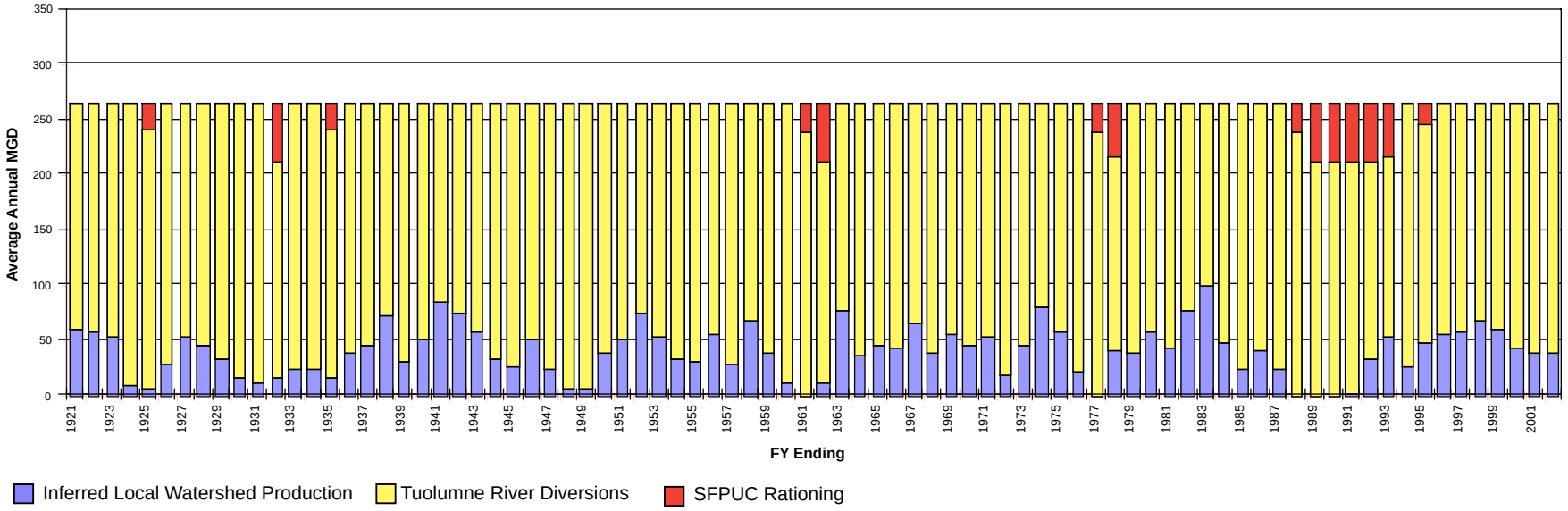
The significance criteria used in this PEIR are based on San Francisco Planning Department, Major Environmental Analysis (MEA) guidance regarding the environmental effects to be considered significant. MEA guidance is, in turn, based on the CEQA Guidelines Appendix G with some modifications. In cases where potential environmental issues associated with the WSIP are identified but are not clearly addressed by MEA's guidance, additional impact significance criteria are presented. Appendix B of this PEIR presents the MEA Initial Study checklist as it applies to the WSIP, and indicates the criteria applicable to the WSIP and discussed in the various chapters in the PEIR. The significance criteria used for each environmental topic/resource area are presented in each section of Chapter 5 following the setting and before the discussion of impacts.

For the impact analyses, the following categories are used to determine impact significance:

Not Applicable/No Impact (N/A). An impact is considered not applicable to the WSIP water supply or system operations if the environmental resource or impact potential does not occur within the project area or the area of potential effect. For example, an impact on a biological resource may not be applicable if the WSIP would not result in changes in stream flow for a specific reach of a creek.

Beneficial (B). An impact is considered beneficial if it is determined that WSIP water supply or system operations would improve an environmental resource or result in a beneficial effect on the environment.

Less than Significant (LS). This determination applies if there is a potential for limited impact, but the impact does not constitute a substantial adverse effect that qualifies under the significance criteria as a significant effect. LS impacts do not require mitigation.

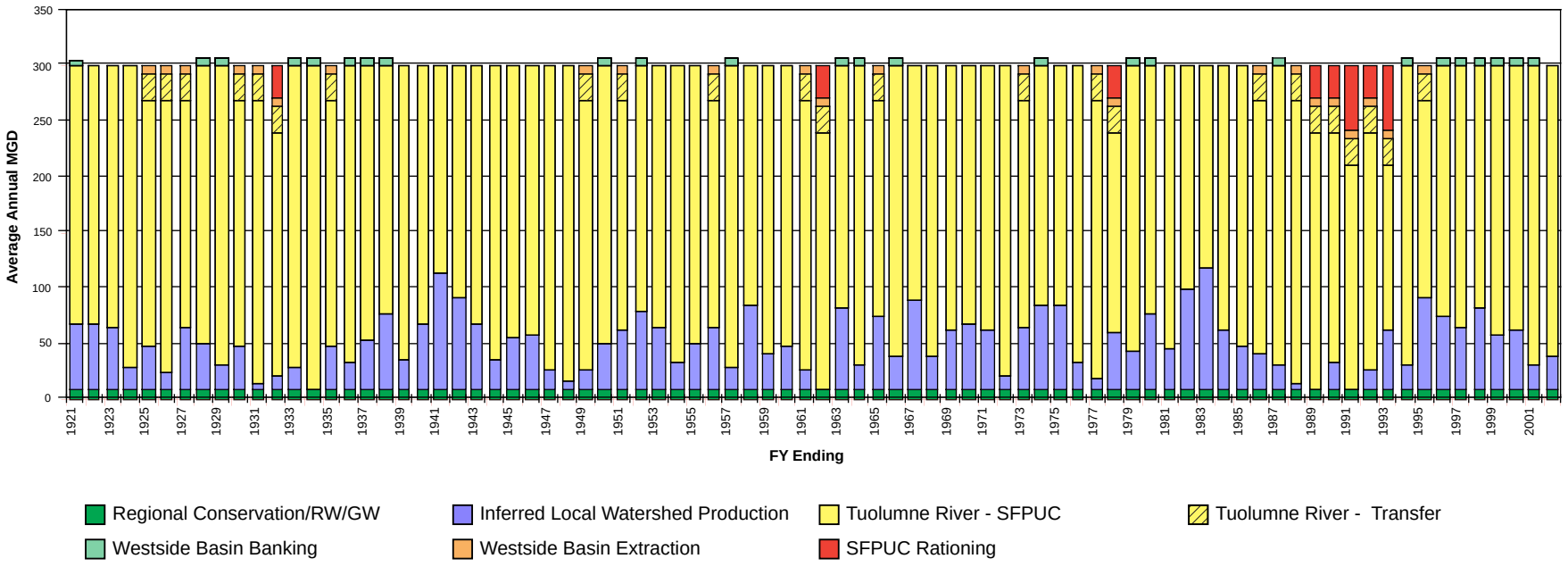


This figure illustrates what combination of supply sources the regional system would use year to year under existing conditions to meet the existing system delivery demand of 265 mgd if it were operated over a long series of years similar in terms of climate conditions to those that occurred between 1920 and 2002. This 82-year simulation illustrates how the relative contribution of water supply sources available to the SFPUC would vary year to year and shows the frequency and extent of supply shortages and rationing that would occur if there were dry years and drought periods similar to those that occurred during this historic period.

NOTES: (1) This figure illustrates a conceptual breakdown of water sources available to the SFPUC regional system. Local Watershed Production (inferred) is estimated as the difference between the amount of water delivered to system customers and the amount of water provided by the San Joaquin pipeline (Tuolumne River) and extracted from the Westside Basin groundwater aquifer. This estimate does not account for the source of Bay Area system reservoir storage used to serve deliveries or the partial use of San Joaquin pipeline deliveries for replenishment of Bay Area system reservoirs.

SOURCE: SFPUC, HH/LSM (see Appendix H)

Figure 5.1-4
Water Supply Sources and Shortages – Existing Conditions (265 mgd Delivery)



This figure illustrates what combination of supply sources the regional system would use year to year under future 2030 conditions to meet the future demand of 300 mgd if it were operated over a long series of years similar in terms of climate condition to those that occurred between 1920 and 2002. This 82-year simulation illustrates how the relative contribution of water supply sources available to the SFPUC would vary year to year and shows the frequency and extent of supply shortages and rationing that would occur if there were dry years and drought periods similar to those that occurred during this historic period.

NOTES: (1) This figure illustrates a conceptual breakdown of water sources available to the SFPUC regional system. Local Watershed Production (inferred) is estimated as the difference between the amount of water delivered to system customers and the amount of water provided by the San Joaquin pipeline (Tuolumne River) and extracted from the Westside Basin groundwater aquifer. This estimate does not account for the source of Bay Area system reservoir storage used to serve deliveries or the partial use of San Joaquin pipeline deliveries for replenishment of Bay Area system reservoirs.
(2) Deliveries in excess of 300 mgd represent banking of water into the Westside Basin groundwater aquifer under the proposed Westside Basin Groundwater conjunctive use program.

SOURCE: SFPUC, HH/LSM (see Appendix H)

Figure 5.1-5
Water Supply Sources and Shortages – 2030 WSIP Conditions (300 mgd Delivery)

Potentially Significant, Mitigable (PSM) / Significant Mitigable (SM). These determinations apply if there is a potential for a substantial adverse effect that meets the significance criteria, but implementation of mitigation measures would reduce the impact to a less-than-significant level. In cases where the analysis cannot conclusively determine the extent of adverse effects, the PEIR errs on the conservative side by identifying the impact as "potentially" significant; the impacts identified as "potentially significant" are treated as significant impacts in this PEIR. Similarly, "significant, mitigable" applies if there is certainty that a substantial adverse effect that meets the significance criteria would occur, but implementation of mitigation measures would reduce the impact to a less-than-significant level. In either event, the mitigation measures identified in this PEIR are expected to reduce any significant effects to a less-than-significant level.

Potentially Significant, Unavoidable (PSU) / Significant, Unavoidable (SU). These determinations apply to impacts that are potentially significant or significant, but for which there appears to be no feasible mitigation available to reduce them to a less-than-significant level. Mitigation might be available to lessen the effect of the impact, but the residual effect, even after implementation of the measure, would remain significant and therefore unavoidable. Alternatively, the PSU determination is applied in cases where mitigation might lessen the effect of an impact, but it is unknown if the mitigation could effectively reduce the impact to a less-than-significant level. When the effectiveness of a mitigation measure is unknown, the PEIR errs on the conservative side and applies this determination. The impacts identified as potentially significant are treated as significant impacts in this PEIR.

In each section of this chapter, a summary table is provided at the beginning of each impact discussion to summarize the potential impacts and to indicate the level of impact significance. The impact discussions for the WSIP water supply and system operations are organized by watershed or affected water resource. Impacts are numbered by section, and corresponding numbers are used to identify the mitigation measures presented in Chapter 6.

References – Overview

San Francisco Public Utilities Commission (SFPUC), *Water Supply System Modeling Report, Hetch Hetchy/Local Simulation Model*, 2007a.

San Francisco Public Utilities Commission (SFPUC), *Water Supply Options*, June 2007b.

5.2 Plans and Policies

5.2 Plans and Policies

Section 5.2 Subsections	
5.2.1	Overview
5.2.2	Regulatory Framework
5.2.3	Relevant Plans, Policies, and Planning Action
5.2.4	Plan Consistency Evaluation
(References included under each section)	

5.2.1 Overview

The purpose of this section is two-fold: (1) to provide an overview of the federal, state, and local plans and policies governing the SFPUC's water supply, including water quality, water use, and natural resource protection; and (2) to describe program consistency with applicable, adopted land use and resource plans and policies relevant to the WSIP water supply option and system operations, pursuant to CEQA Guidelines Section 15125(d).

The regulatory overview for Chapter 5 is summarized in this section to avoid repetition of the general description of applicable environmental regulations in the various sections of this chapter. Because Chapter 5 is organized by watersheds and related drainage areas rather than by environmental resources, only those aspects of the regulations specifically applicable to each watershed are presented in the respective sections. For example, the regulatory overview for Chapter 5 presented in this section includes a general description of the Clean Water Act and the Porter-Cologne Water Quality Control Act, but the description of applicable water quality control plans (WQCPs), beneficial uses, and water quality objectives are described separately in Sections 5.3.3, 5.4.3, and 5.5.3 for the Tuolumne River, Alameda Creek, and Peninsula watersheds, respectively.

The analysis in this section complements that presented in Section 4.2, Plans and Policies, which focuses on land use plans and policies relevant to construction and operation of the proposed WSIP facility improvement projects. Together, Sections 4.2 and 5.2 provide an evaluation of project consistency with the overall plans and policies relevant to the proposed program.

5.2.2 Regulatory Framework

In general, implementation and enforcement responsibility of governmental regulations flows down from federal and state jurisdictions to the regional, county, and municipal levels. Although the federal government establishes programs and sets minimum standards that are applicable nationwide, state and local jurisdictions have the authority to set more stringent standards than those established under federal law. The SFPUC currently complies with all applicable federal, state, and local regulations regarding municipal water supplies and would continue to do so under the WSIP. Responsible agencies and applicable federal, state, and local statutes and agreements

are discussed below. **Table 5.2-1** summarizes the applicability of the statutes and agreements to the proposed WSIP water supply and system operations.

Federal Agencies

U.S. EPA Office of Water

The U.S. Environmental Protection Agency (U.S. EPA) Office of Water, established in 1970, is the primary federal agency responsible for implementation of the Clean Water Act and Safe Drinking Water Act. The U.S. EPA Office of Water provides guidance, specifies scientific methods and data collection requirements, establishes contaminant thresholds, and provides oversight to state and local governments for compliance with the Clean Water Act and Safe Drinking Water Act.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Corps) evaluates permit applications for essentially all construction activities that occur in the nation's waters, including wetlands. Corps permits are also necessary for any work, including construction and dredging, in the nation's navigable waters. The Corps enforces the provisions of Section 404 of the Clean Water Act.

U.S. Fish and Wildlife Service

The mission of the U.S. Fish and Wildlife Service (USFWS) is to provide leadership in protecting fish and wildlife, conserving species habitats, and engaging citizens in the shared stewardship of America's natural resources. The USFWS's primary responsibilities involve the protection of migratory birds, endangered species, certain marine animals, and freshwater and anadromous fish through various regulations, including the Federal Endangered Species Act, the Federal Power Act, and Section 404 of the Clean Water Act.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) is the primary federal agency involved with the stewardship of marine resources and their habitats through science-based conservation and management. The NMFS receives its ocean stewardship responsibilities under many federal laws, including the Federal Endangered Species Act, Section 404 of the Clean Water Act, and the Federal Power Act.

The Department of the Interior and the Department of Agriculture

The Department of the Interior (DOI) and the Department of Agriculture are the primary federal agencies involved with regulation under and enforcement of the Raker Act (see Chapter 2, Section 2.4.2, for further description of the Raker Act).

TABLE 5.2-1
APPLICABLE FEDERAL, STATE, AND LOCAL STATUTES AND AGREEMENTS

Statute or Agreement / Responsible Agency[a]	Summary Description	Associated Statutes and Plans	Applicability to WSIP Water Supply and System Operations Issues
Federal			
Clean Water Act / U.S. EPA, Corps, USFWS, NMFS	Primary federal law governing water quality. Prescribes basic federal laws for regulating discharges of pollutants into waters of the U.S., including establishing water quality standards for contaminants in surface waters, establishing wastewater and effluent discharge limits from various industry categories, and imposing requirements for controlling nonpoint-source pollution.	Section 303(d), Section 404, various others	Discussed and analyzed by watershed in Sections 5.3.3, 5.3.6, 5.4.3, 5.4.6, 5.5.3, and 5.5.6.
Safe Drinking Water Act / U.S. EPA	Sets health-based standards for drinking water quality to protect against naturally occurring and man-made contaminants that can be found in drinking water.	National Primary and Secondary Drinking Water Regulations	Described in Chapter 2, Section 2.4.1, regarding existing system, and in Chapter 3, Section 3.5.1, regarding proposed program.
Raker Act / U.S. Congress	Granted the City and County of San Francisco (CCSF) rights-of-way to certain public lands, including public lands in Yosemite National Park and Stanislaus National Forest, to develop water and power.		Described in Chapter 2, Section 2.4.2, and in Chapter 3, Sections 3.6 and 3.7, regarding existing and proposed water supply and operations.
Wilderness Act / U.S. Congress	Established the National Wilderness Preservation System to be composed of federally owned lands designated by Congress as wilderness areas, to be administered in such a manner that will leave them unimpaired for future use.	National Wilderness Preservation System	Designation of the 459-square-mile Tuolumne River watershed above Hetch Hetchy Reservoir as a wilderness area provides unique measures of protection to the watershed. Discussed in Section 5.2.3.
Wild and Scenic Rivers Act / BLM, NPS, USFS	Preserves the free-flowing characteristics and outstanding values of designated rivers while allowing uses compatible with the management goals of that river.	Management plans and concept plans for designated rivers	Described in Section 5.2.3 and evaluated in Section 5.2.4 for consistency. Discussed and analyzed in Section 5.3.7 regarding biological resources, as well as in Section 5.3.8 regarding visual resources.
Endangered Species Act / USFWS, NMFS	Provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the U.S. or elsewhere.	Habitat conservation plans	Discussed by watershed in Sections 5.3, 5.4, and 5.5, under Fisheries and Terrestrial Biological Resources.
New Don Pedro Project FERC Settlement Agreement / FERC	Established a revised instream flow schedule for New Don Pedro Project operation and outlined a strategy for recovery of Tuolumne River Chinook salmon.	Habitat Restoration Plan for the Lower Tuolumne River Corridor (guidance document)	Discussed in Chapter 2, Section 2.5, under Institutional Considerations, in Chapter 3, Section 3.8, regarding proposed operations, and Sections 5.3.6, Fisheries, and 5.3.7, Biological Resources.

TABLE 5.2-1 (Continued)
APPLICABLE FEDERAL, STATE, AND LOCAL STATUTES AND AGREEMENTS

Statute or Agreement / Responsible Agency[a]	Summary Description	Associated Statutes and Plans	Applicability to WSIP Water Supply and System Operations Issues
State of California			
California Water Code / DWR and SWRCB	Contains the basic provisions regarding management of the state's water resources as well as the legislative findings for the California Water Plan.	California Water Plan, Water Reuse Law, California Recycling Act, Urban Water Management Planning Act, Wholesale Regional Water System Security and Reliability Act, etc.	Used in ongoing management and operation of the regional water system as well as in development of the WSIP.
California Water Code, Sections 10610–10656, Urban Water Management Planning Act / DWR	Requires urban water suppliers that provide water to 3,000 or more customers, or that provide over 3,000 acre-feet of water annually, to prepare an urban water management plan (UWMP) every five years.	UWMPs prepared by the CCSF and applicable Bay Area Water Supply and Conservation Agency (BAWSCA) members	Information in the UWMPs of the CCSF and BAWSCA members was used in the development of the WSIP 2030 level of service for water supply, as discussed in Chapter 3, Section 3.4.4, and Chapter 7; the San Francisco UWMP is analyzed in Section 5.2.
California Water Code, Sections 73500–73514, Wholesale Regional Water System Security and Reliability Act (AB 1823) / California legislature / DHS	Requires the SFPUC to operate the regional water system in a manner that will not adversely affect the water system. Includes the Water First Policy, which specifies that the CCSF shall assign higher priority to the delivery of water to the Bay Area than to the generation of electrical power.	WSIP (referred to as a capital improvement program in the legislation but renamed as the WSIP)	Part of WSIP development, goals, objectives, and operations, as described in Chapter 2, Section 2.4, and Chapter 3, Sections 3.4 and 3.7.
Porter-Cologne Water Quality Control Act / SWRCB, RWQCBs	Established SWRCB and RWQCBs as the principal state agencies with primary responsibility for the coordination and control of water quality. Established a comprehensive program for the protection of water quality and beneficial uses of water. Applies to surface waters (including wetlands), groundwater, and point and nonpoint sources of pollution.	Water quality control plans (WQCPs) designate legally binding beneficial uses of water for water bodies, including wetlands, assign water quality objectives (criteria) to protect those uses, and establish appropriate implementation programs.	Discussed and analyzed by watershed in Sections 5.3, 5.4, and 5.5, in the Surface Water Quality and Groundwater sections.
California Safe Drinking Water Act / DHS	Strengthens minimum requirements found in the federal Safe Drinking Water Act. Establishes drinking water standards that are at least as stringent as, and sometimes more stringent than, those established under the federal act.	Drinking water requirements, including Primary and Secondary Maximum Contaminant Levels	Discussed in Chapter 2, Section 2.4.1, and Chapter 3, Section 3.5.1, pertaining to WSIP water quality objectives.
San Joaquin River Agreement / SWRCB	Provides the basis for the development of the Vernalis Adaptive Management Program (VAMP) study and identifies where the water to support the VAMP study would be obtained.	Vernalis Adaptive Management Program (Experimental study)	Discussed in Sections 5.2 and 5.3.1.
McAteer-Petris Act / BCDC	Promotes responsible planning and regulation of San Francisco Bay. Establishes BCDC as the agency responsible for carrying out the provisions of the act and of the SF Bay Plan.	San Francisco Bay Plan	Described in Section 5.2.3 and evaluated in Section 5.2.4 for consistency. Analyzed in Section 5.3.3.

TABLE 5.2-1 (Continued)
APPLICABLE FEDERAL, STATE, AND LOCAL STATUTES AND AGREEMENTS

Statute or Agreement / Responsible Agency[a]	Summary Description	Associated Statutes and Plans	Applicability to WSIP Water Supply and System Operations Issues
State of California (cont.)			
California Fish and Game Code / Fish and Game Commission and CDFG	Provides a system for the restoration and preservation of California's fish and wildlife resources	California Endangered Species Act (CESA), California Environmental Quality Act (CEQA), Lake and Streambed Alterations	CEQA review of the proposed water supply and system operations aspects of the WSIP is presented in Chapter 5, including the impacts of the WSIP on species listed under CESA, as discussed in Sections 5.3.7, 5.4.6, and 5.5.6.
Regional and Local			
San Francisco City Charter / CCSF	Establishes many of the procedures and requirements for initiative ordinances and declarations of policy.	San Francisco General Plan San Francisco Sustainability Plan SFPUC Alameda Watershed Management Plan SFPUC Peninsula Watershed Management Plan SFPUC Stewardship Policy	Sets forth guidance and authority of the SFPUC for construction, management, supervision, maintenance, extension, expansion, and operation of the regional water system.

[a] Responsible agencies are as follows:

BLM = Bureau of Land Management
CCSF = City and County of San Francisco
Corps = U.S. Army Corps of Engineers
DHS = California Department of Health Services
DWR = California Department of Water Resources
FERC = Federal Energy Regulatory Commission
NMFS = National Marine Fisheries Service
NPS = National Park Service
RWQCB = Regional Water Quality Control Board
SFPUC = San Francisco Public Utilities Commission
SWRCB = State Water Resources Control Board
U.S. EPA = U.S Environmental Protection Agency
USFS = U.S. Forest Service
USFWS = U.S. Fish and Wildlife Service

Bureau of Land Management

The Bureau of Land Management (BLM), an agency within the U.S. Department of the Interior, administers America's public lands within a framework of numerous laws, including the federal Wild and Scenic Rivers Act. The BLM manages a wide variety of resources and uses, including fish and wildlife habitat, wilderness areas, timber, and archaeological, paleontological, and historical sites.

National Park Service

The National Park Service (NPS) is a bureau of the U.S. Department of the Interior. The NPS is responsible for the oversight of nearly 400 natural, cultural, and recreational sites across the nation, including scenic rivers and trails. The NPS is also responsible for the management of Yosemite National Park, administration of the designated wild and scenic reaches of the Tuolumne River under the Wild and Scenic Rivers Act, and preparation of the *Tuolumne Wild and Scenic River Comprehensive Management Plan* and the *Tuolumne Meadows Concept Plan* (both in development).

Federal Statutes and Agreements

Clean Water Act

The Clean Water Act, enacted by Congress in 1972 and amended several times since inception, is the primary federal law regulating water quality in the U.S. and forms the basis for several state and local laws throughout the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The Clean Water Act prescribes the basic federal laws for regulating discharges of pollutants into waters of the U.S., including setting water quality standards for contaminants in surface waters, establishing wastewater and effluent discharge limits from various industry categories, and imposing requirements for controlling nonpoint-source pollution. At the federal level, the Clean Water Act is administered by the U.S. EPA. At the state and regional levels, the act is administered and enforced by the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs).

Section 404 of the Clean Water Act established a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Activities in waters of the U.S. regulated under this program include the placement of fill for development, water resource, infrastructure, and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the U.S., unless the activity is exempt from Section 404 regulation. Under Section 401 of the Clean Water Act, every applicant for a federal permit for any activity that may affect waters of the state must obtain a water quality certification that the proposed activity will comply with state water quality standards.

Safe Drinking Water Act

The Safe Drinking Water Act, passed by Congress in 1974 for the purpose of protecting public health, regulates public drinking water supplies derived from various sources, including rivers,

lakes, reservoirs, springs, and groundwater wells. The federal Safe Drinking Water Act is implemented by the U.S. EPA. The Safe Drinking Water Act is discussed in more detail in Chapter 2, Section 2.4.1.

National Forest Management Act

The National Forest Management Act, enacted by Congress in 1976, is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to assess forest lands, and to develop and implement a resource management plan for each unit of the National Forest System. The management plans must: ensure consideration of both economic and environmental factors; provide for wildlife and fish; provide for the diversity of plant and animal communities; ensure timber harvesting will occur only where water quality and fish habitat are adequately protected from serious detriment; and ensure clearcutting and other harvesting will occur only where it may be done in a manner consistent with the protection of soil, watersheds, fish, wildlife, recreation, aesthetic resources, and regeneration of the timber resource. The management plans must be updated at least once every 15 years. In the overall WSIP region, the Sierra Nevada Framework is the management plan governing Stanislaus National Forest. The provisions of the Sierra Nevada Framework are implemented by the U.S. Forest Service.

Raker Act

The Raker Act, passed by Congress in 1913, granted to the City and County of San Francisco (CCSF) rights-of-way to certain public lands, including public lands in Yosemite National Park and Stanislaus National Forest, to develop water and power. (See Chapter 2, Section 2.4.2, for further description.)

Wilderness Act

The Wilderness Act,[1] enacted by Congress in 1964, established a National Wilderness Preservation System composed of federally owned and designated wilderness areas. The purpose of the National Wilderness Preservation System is to preserve wilderness areas for future use and enjoyment. Human activities in designated wilderness areas are limited to those that leave no long-term impact on the land or that have little or no effect on the natural resources of the area. With limited exceptions, no commercial enterprises or permanent roads are allowed within a wilderness area.

The portion of the Tuolumne River watershed that drains into Hetch Hetchy Reservoir (459 square miles) is entirely within Yosemite National Park, and approximately 95 percent of the watershed is federally designated wilderness. This designation provides unique measures of protection to the watershed. The NPS manages Yosemite National Park to preserve the resources that contribute to Yosemite's uniqueness and attractiveness in accordance with the goals and principles of the 1964 Wilderness Act (USFS, 1986).

Wild and Scenic Rivers Act

In 1968, Congress enacted the Wild and Scenic Rivers Act[2] for the purpose of preserving the free-flowing characteristics and outstanding values of designated rivers while allowing uses compatible with the management goals of designated rivers. Specifically, designation as a Wild and Scenic River prohibits the federal government from licensing or permitting hydroelectric dams or major diversions along the designated reaches. The act also provides for the management of federal public lands within the corridor of the designated river. Segments are classified into one of three designations that are based on the level of existing development (and not on a description of any particular values): *wild* segments are wild, unroaded, and undeveloped; *scenic* segments are generally undeveloped, but may have occasional road crossings and riverside structures that are visually screened from the river; and *recreational* segments are generally developed with roads, bridges, and structures (Friends of the River, 2007).

1 The Wilderness Act of 1964, Pubic Law Sections 88–577; 16 United States Code Sections 1131–1136.
2 The California Wild and Scenic Rivers Act of 1972 (Public Resources Code, Sections 5093.50 et seq.), modeled after the federal Wild and Scenic Rivers Act, does not designate any rivers that would be affected by WSIP projects.

In 1984, Congress designated 83 miles of the main stem of the Tuolumne River, from its source to Don Pedro Reservoir, as a wild and scenic river, as shown in **Figure 5.2-1**. The classification and mileage of the designated reach is as follows: 47 miles wild, 23 miles scenic, and 13 miles recreational. A total of 54 miles of the designated river are located within Yosemite National Park (not including Hetch Hetchy Reservoir, which was excluded from the designation), and 29 miles of the designated river are located outside of Yosemite National Park (USFWS, 2007). In accordance with the Wild and Scenic Rivers Act, federal agencies are required to prepare a comprehensive management plan for designated rivers within three years of designation to guide future management decisions. The designation does not affect any rights, obligations, privileges, or benefits granted under the Raker Act. The NPS administers wild and scenic rivers that flow wholly or partly within the boundaries of the national park system; the Secretary of Agriculture administers wild and scenic rivers that flow wholly or partly within the boundaries of national forests.

Endangered Species Act

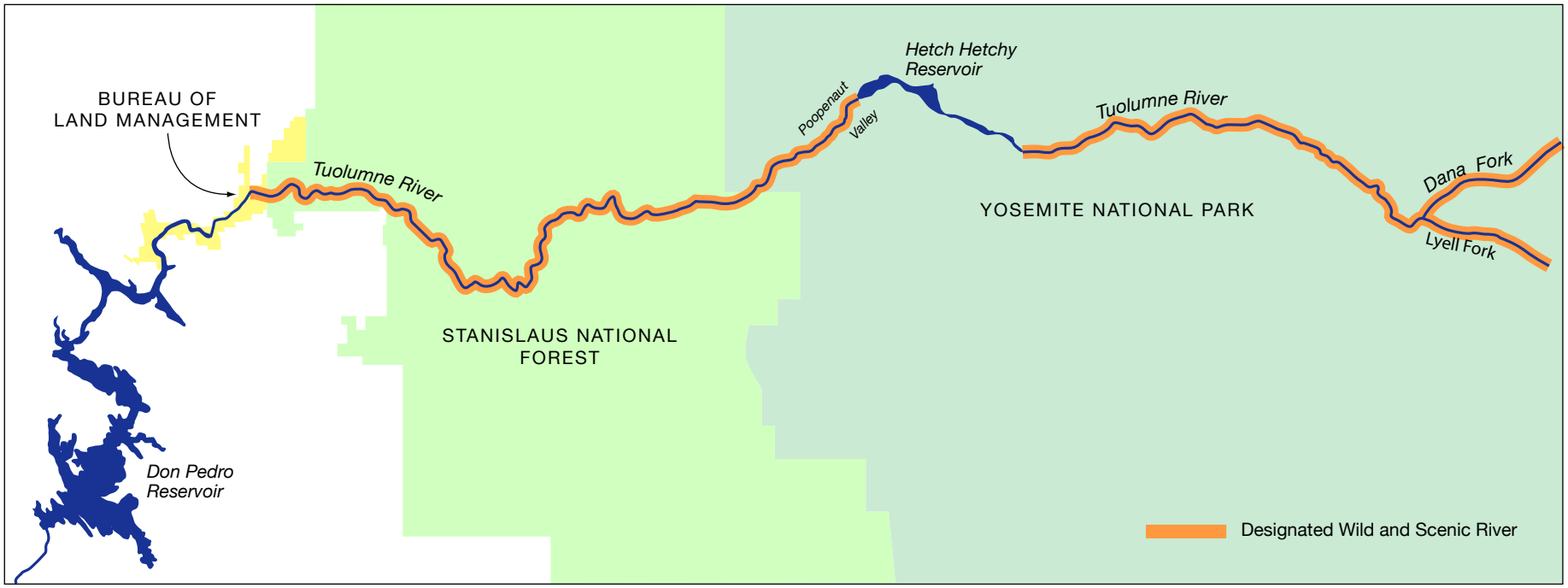
The Federal Endangered Species Act of 1973 provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the U.S. or elsewhere. Provisions of the act provide for the listing of species, preparation of recovery plans, and designation of critical habitat for listed species. Federal agencies must follow the act's provisions when taking actions that may jeopardize listed species. The Federal Endangered Species Act is enforced by the USFWS and NMFS. The California Endangered Species Act generally parallels the main provisions of the federal law and is administered by the California Department of Fish and Game (CDFG).

Federal Power Act

The Federal Power Act of 1920 requires hydropower project owners to obtain a license from the Federal Energy Regulatory Commission (FERC). Among other purposes, FERC is charged with protecting fish and wildlife, including related spawning grounds and habitat, as well as mitigating impacts on recreation. The Federal Power Act authorizes the USFWS and NMFS to issue mandatory fishway prescriptions to ensure adequate protection, mitigation, and enhancement of fish and wildlife and their habitats. The Hetch Hetchy Project is statutorily exempt from provisions of the Federal Power Act. The Don Pedro Project is subject to FERC jurisdiction for its hydropower operations.

New Don Pedro Project FERC Settlement Agreement

Executed in 1995 by Tuolumne River stakeholder groups, the FERC Settlement Agreement established a revised instream flow schedule for New Don Pedro Project operation and outlined a strategy for recovery of Tuolumne River Chinook salmon (TID/MID, 1996). The revised flow schedule and a monitoring program were subsequently ordered by FERC in 1996, when FERC amended the license for the New Don Pedro Project to incorporate the settlement agreement flow schedules. The agreement requires implementation of measures to improve Chinook salmon habitat and increase populations, including increased flows, habitat rehabilitation and improvement, and measures to improve smolt survival. The FERC order required TID and MID



5.2-9

SOURCE: ESA + Orion

SFPUC Water System Improvement Program . 203287

Figure 5.2-1

Tuolumne River, Wild and Scenic River Designation

to file a 10-year report on the success of the flow modifications, and non-flow mitigation measures were reevaluated in 2005 (TID/MID, 2005). In 2000, the Tuolumne River Technical Advisory Committee (TRTAC), completed the *Habitat Restoration Plan for the Lower Tuolumne River Corridor* (TRTAC, 2000) as the primary planning product of the Settlement Agreement. The restoration plan is to be used by the Tuolumne River Technical Advisory Committee to help fulfill its obligations to FERC under the Settlement Agreement. It is a technical resource document intended to aid in identifying areas of potential habitat improvement and to provide guidance for restoring or rehabilitating these areas (see Section 5.2.3 for further description of the plan). The restoration plan has not been formally adopted by any federal, state or local agency.

State Agencies

California Department of Water Resources

The Department of Water Resources (DWR) is responsible for the overall management of California's water resources. Duties performed by the DWR include, but are not limited to, developing strategies for managing the state's water resources, including updates of the *California Water Plan*; operating and maintaining the State Water Project; and providing policy direction and legislative guidance on water and energy issues.

The DWR owns and operates Del Valle Reservoir in the Alameda Creek watershed. The DWR constructed this facility primarily for flood control and recreational purposes as well as to provide regulatory flows in the South Bay Aqueduct (DWR, 1997). Since 1969, through a series of agreements among the DWR, Alameda County Water District, and Zone 7 Water Agency, local water has been stored for later release and subsequent beneficial use by the water districts under their SWRCB permits. The disposition of stored local inflow is determined by the districts. Water can be released into Arroyo del Valle, released into the South Bay Aqueduct, exchanged for an equivalent amount of South Bay Aqueduct water, or any combination of the foregoing (DWR, 1997). Under the current agreement, the DWR is allowed to use local inflow at times when the districts cannot use all or part of this supply.

California Department of Health Services

The California Department of Health Services (DHS) is responsible for the enforcement of the Safe Drinking Water Act and regulation of public water systems through the Drinking Water Program. DHS activities include field inspections of water systems, source water assessments, issuance of operating permits, review of plans and specifications for new facilities, enforcement actions for noncompliance with laws and regulations, and promotion of water system security. The DHS also regulates the use of recycled water by establishing water quality standards and treatment reliability criteria for recycled water under Title 22 of the California Code of Regulations.

California Fish and Game Commission

The California Fish and Game Commission (Commission) has the statutory authority to formulate guidance policies for the California Department of Fish and Game (CDFG). The Commission has over 200 powers and duties listed in the statutes of the Fish and Game Code. Principal among

these are legislatively granted powers for the regulation of the sport take and possession of birds, mammals, fish, amphibians, and reptiles. The Commission oversees the establishment of wildlife areas and ecological reserves and regulates their use, and prescribes the terms and conditions under which permits or licenses may be issued by the CDFG. A primary responsibility of the Commission is to afford an opportunity for full public input and participation in the decision- and policy-making process of adopting regulations or taking other actions related to the well-being of California's fish and wildlife resources.

The Commission sets policy for the CDFG, while the CDFG is the lead state agency charged with implementing, safeguarding, and regulating the uses of fish and wildlife.

California Department of Fish and Game

The mission of the CDFG is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The CDFG enforces multiple programs dedicated to the conservation and preservation of habitats and species in California, including the California Endangered Species Act (CESA), California Environmental Quality Act (CEQA), and California Fish and Game Code. Under CESA, the CDFG is responsible for consulting with state lead agencies to determine if their actions would affect a state-listed threatened or endangered species. Under CEQA, the CDFG is responsible for consulting with lead and responsible agencies and providing the requisite biological expertise to review and comment upon environmental documents and impacts arising from project activities. The CDFG is also responsible for enforcing the provisions of the California Fish and Came Code.

State Water Resources Control Board

The SWRCB, created in 1967, has the primary authority over state water rights and water quality policy. The SWRCB is responsible for the enforcement of the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code), which deals with potential discharges into

water bodies that could result in adverse impacts on water quality. The regulations enacted by the SWRCB are enforced by the nine regional boards at the local and regional level.

California Regional Water Quality Control Boards

The mission of the California RWQCBs is to develop and enforce water quality objectives and implementation plans that will best protect the beneficial uses of the state's waters, recognizing local differences in climate, topography, geology, and hydrology. The RWQCBs engage in a number of water quality functions in their respective regions. One of the most important is preparing and periodically updating WQCPs. The San Francisco Bay and Central Valley RWQCBs are the relevant boards reviewing WSIP projects.

State Statutes and Agreements

California Fish and Game Code

The Fish and Game Code provides a system for the protection of California's fish and wildlife resources and includes: provisions related to fish and wildlife protection and conservation; fish and game management; wetlands mitigation banking; endangered species; and operation of dams, conduits, and screens.

California Water Code

The California Water Code contains the fundamental provisions related to management of the state's water resources. The California Water Code requires that water resources of the state be put to beneficial use to the fullest possible extent, and that waste, unreasonable use, or unreasonable method of use be prevented. Acts contained under the California Water Code relevant to the WSIP include the Water Reuse Law, Urban Water Management Planning Act, California Water Recycling Act, and Wholesale Regional Water System Security and Reliability Act.

Urban Water Management Planning Act

The Urban Water Management Planning Act, enacted in 1983 by the state legislature, requires urban water suppliers that provide water to 3,000 or more customers, or that provide over 3,000 acre-feet of water annually, to prepare an urban water management plan (UWMP). UWMPs are updated every five years and must describe and evaluate existing and planned sources of water supply; discuss the reliability of the water supply with respect to seasonal or climatic shortages; describe demand management measures to be implemented by the water supplier; and provide an implementation strategy and schedule for any future planned water supply projects and water supply programs. The act is administered by the DWR (California Water Code Sections 10620–10621).

Wholesale Regional Water System Security and Reliability Act and Water First Policy

California Assembly Bill No. 1823 (AB 1823), known as the Wholesale Regional Water System Security and Reliability Act, imposed various requirements on wholesale water systems. The bill, adopted in 2002, required the SFPUC, acting on behalf of the CCSF, to adopt a capital

improvement program by February 1, 2003; to adopt an emergency response plan by September 1, 2003; to distribute available water during any interruption to customers on an equitable basis; to continue operating reservoirs in Tuolumne County in a manner that ensures hydroelectric power generation does not cause any reasonably anticipated impacts on water service; and to assign a higher priority to water Bay Area deliveries than to power generation (California Water Code Sections 73500–73514). The act also includes the SFPUC's Water First Policy.

The Water First Policy, contained in Section 73504(b) of the California Water Code, was formally established in the San Francisco City Charter following adoption of AB 1823 by the state legislature and approval of Proposition E by San Francisco voters. Under this policy, the SFPUC must place water service to the Bay Area before the generation of hydroelectric power. (See Chapter 2, Section 2.4.3 for additional information on AB 1823.)

McAteer-Petris Act

The McAteer-Petris Act was passed by the state legislature in 1965 to promote responsible planning and regulation of San Francisco Bay. The act designates the San Francisco Bay Conservation and Development Commission (BCDC) as the agency responsible for maintaining and carrying out the provisions of the act and the SF Bay Plan (for additional information on the act, see Chapter 4, Section 4.2, p. 4.2-8).

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act was passed by the state legislature in 1969 and is the primary statute covering the quality of waters in California. The act specifies water quality provisions and discharge requirements for regulating the discharge of waste that could affect the quality of state waters. Under the act, the SWRCB has the ultimate authority over state water rights and water quality policy. The nine RWQCBs are responsible for the oversight of water quality on a day-to-day basis at the local and regional level.

California Safe Drinking Water Act

The California Safe Drinking Water Act, administered by the DHS, strengthens the minimum requirements found in the federal Safe Drinking Water Act and establishes drinking water standards that are at least as stringent as, and sometimes more stringent than, those established under the federal act. California's development of drinking water standards for MTBE is an example of its more aggressive standards.

San Joaquin River Agreement

The 1995 Water Quality Control Plan (WQCP) for the San Francisco/Sacramento–San Joaquin Delta Estuary included water quality and flow objectives pertaining to the San Joaquin River basin. Disputes over the science supporting the flow objective for the San Joaquin River as measured in Vernalis (shown in Section 5.3, Figure 5.3-1) led to the development of an experimental program to develop an adaptive fishery management plan and the water supplies to support that plan. The San Joaquin River Agreement, adopted by the SWRCB in April 1998, provided the basis for development of the Vernalis Adaptive Management Program (VAMP) and identified where much of the water to support the VAMP study would be obtained (specifically, from the San Joaquin River Group Authority). The VAMP is an experimental management program designed to protect juvenile Chinook salmon migrating from the San Joaquin River through the Delta (San Joaquin River Group Authority, 1999). The VAMP study is summarized below in Section 5.2.3 and discussed in more detail in Section 5.3.1.

Local and Regional Agencies

City and County of San Francisco

As a department of the CCSF, the SFPUC has authority over the management, use, and control of the regional water system pursuant to the San Francisco City Charter, Section 8B.121. Chapter 3, Section 3.3, presents the mission of the SFPUC relative to the objectives of the WSIP, and Section 3.13 describes the role of the CCSF and its various departments with respect to the actions and approvals required for adoption of the WSIP.

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Conservation and Development Commission (BCDC) is the agency responsible for maintaining and carrying out the provisions of the McAteer-Petris Act and the SF Bay Plan. In the public interest, BCDC is authorized to control bay filling and dredging and bay-related shoreline development. Due to the regulatory authority of the State Water Resources Control Board (SWRCB), San Francisco Bay Regional Water Quality Control Board, U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers, BCDC's scope of authority over water quality issues is limited. (For additional information on BCDC's regulatory authority, see Chapter 4, Section 4.2, p. 4.2-8.)

Alameda Creek Watershed Regional Agencies

In addition to the CCSF, three regional resource agencies have jurisdiction within the Alameda Creek watershed. There are no local or regional resource agencies with jurisdiction over areas within the Tuolumne and Peninsula watersheds or the Westside Groundwater Basin (beyond those described in Chapter 3, Section 3.13, related to the conjunctive-use program) that could be affected by the proposed water supply and system operations.

Alameda County Flood Control and Water Conservation District

The Alameda County Flood Control and Water Conservation District (ACFCWCD) works specifically to protect county citizens from flooding hazards. The ACFCWCD is responsible for planning, designing, and inspecting flood control projects; maintaining flood control infrastructure; assisting in planning new developments to preserve the integrity of the flood control system; and providing public outreach and enforcement of pollution control regulations governing county waterways.

Zone 7 Water Agency

Zone 7 Water Agency, one of 10 active zones of the ACFCWCD, covers the eastern portion (425 square miles) of Alameda County, including Pleasanton, Livermore, and Dublin. Zone 7's entire service area lies within the Alameda Creek watershed. Unlike the other zones, Zone 7 was created by state law and has its own board of directors. Zones 7's water resource management responsibilities include providing a wholesale treated drinking water supply, monitoring and protecting surface water and groundwater quality, operating and maintaining a water treatment system, and managing floodwaters and stormwater for public safety and protection of property. In September 2005, Zone 7 adopted the updated *Urban Water Management and Water Shortage Contingency Plan*, which addresses operations as well as water supply and demand.

Zone 7 is the water quality management agency for the Alameda Creek watershed above the town of Niles. The agency does not generally participate in the management of SFPUC lands, with the exception of managing groundwater activities and monitoring development in the Zone 7 service area for erosion potential and channel capacity impacts through the CEQA process.

Zone 7 also serves as a water wholesaler, with supplies originating from local groundwater sources, imported water from the State Water Project, and local water stored in Del Valle Reservoir. The agency is also responsible for mitigating flood hazards in its service area and has undertaken channelization projects on sections of Arroyo de la Laguna, Arroyo del Valle, and Arroyo Mocho.

East Bay Regional Park District

The East Bay Regional Park District's (EBRPD) Sunol and Ohlone Regional Wilderness preserves are within the watersheds of Alameda Creek (below Calaveras Reservoir) and San Antonio Reservoir, respectively. Watershed management activities in these preserves can affect water quality in those receiving waters. The EBRPD has worked with the SFPUC on a number of fish enhancement projects in the watershed, including cattle fencing to keep livestock out of sensitive riparian areas.

Local Regulation

The only local regulation relevant to the WSIP is the San Francisco City Charter.

San Francisco City Charter

The San Francisco City Charter was adopted on November 7, 1995, and became effective July 1, 1996. In November 2002, the voters adopted Proposition E, which amended the charter as it relates to the SFPUC. The charter establishes many of the procedures and requirements for initiative ordinances and declarations of policy. Where the charter does not address a particular aspect of the initiative process, applicable provisions of California law apply. As specified in Section 8B.122 of the charter, the SFPUC is required to develop, periodically update, and implement programs consistent with the following goals and objectives related to water resources:

(1) Provide water and clean water services to San Francisco and water service to its wholesale customers while maintaining stewardship of the system by the City;

(2) Establish equitable rates sufficient to meet and maintain operation, maintenance, and financial health of the system;

(3) Provide reliable water and clean water services and optimize the systems' ability to withstand disasters;

(4) Protect and manage lands and natural resources used by the SFPUC to provide utility services consistent with applicable laws in an environmentally sustainable manner. Operate hydroelectric generation facilities in a manner that causes no reasonably anticipated adverse impacts on water service and habitat;

(5) Develop and implement priority programs to increase and to monitor water conservation and efficiency systemwide;

(6) Utilize state-of-the-art innovative technologies where feasible and beneficial;

(7) Develop and implement a comprehensive set of environmental justice guidelines for use in connection with its operations and projects in the city;

(8) Create opportunities for meaningful community participation in development and implementation of the SFPUC's policies and programs; and

(9) Improve drinking water quality with a goal of exceeding applicable drinking water standards if feasible.

5.2.3 Relevant Plans, Policies, and Planning Actions

U.S. Forest Service, Sierra Nevada Framework

In January 2001, the U.S. Forest Service adopted the Sierra Nevada Forest Plan Amendment (SNFPA or Sierra Nevada Framework), a plan for the management of 11 national forests and 11.5 million acres of national forest land in the Sierra Nevada mountain range, including Stanislaus National Forest. In January 2004, in response to concerns about the flexibility and

compatibility of the SNFPA with other programs related to wildland fire management, the U.S. Forest Service amended the Sierra Nevada Framework to provide additional provisions for fire and fuels treatments. The amended Framework outlines procedures used to manage and protect forests, wildlife habitats, and communities from a variety of threats, including catastrophic fires, and provides a programmatic framework within which project-level decisions are designed and implemented. Key aspects of the SNFPA include: a commitment to restoration and protection of old-growth forest habitat; protection of all trees greater than 30 inches on 11 million of the 11.5 million acres of public land managed by the U.S. Forest Service; designation of riparian conservation areas; improvement and protection of suitable habitat for California spotted owl (*Strix occidentalis occidentalis*), northern goshawk (*Accipiter gentiles*), and willow flycatcher (*Empidonax traillii*); adoption of an integrated vegetation management strategy with the primary objective of protecting communities and modifying landscape-scale fire behavior to reduce the size and severity of fires; and provisions for increased land use management, including grazing, timber production, road construction, and recreation activities. The SNFPA is administered by the U.S. Forest Service (USDA Forest Service, 2004). As no WSIP facility improvement projects are proposed within Stanislaus National Forest, and the resources protected by the SNFPA would not be affected by the WSIP water supply and system operations, the WSIP would be consistent with the provisions of the SNFPA.

Regional Natural Resource Protection Plans

Many of the federal and state statutes and agreements summarized in Section 5.2.2 form the basis for development of the regional natural resource protection plans and policies described in this section. These plans and policies play an important role in the SFPUC's current and future operation of the regional water system by establishing guidelines for the protection of fish,

wildlife, and riparian habitat and by setting enforceable water quality objectives/criteria for surface waters potentially affected by the regional water system. As indicated below, the plans and policies are in various stages of development; only some of the plans and policies are adopted and many are either under development or in a study or experimental stage.

Bay Delta Conservation Plan

The Bay Delta Conservation Plan (BDCP) is an effort driven by Delta water users to provide for the conservation and management of certain aquatic species, both listed and non-listed, and their habitats, while providing for regulatory assurances related to water supply reliability and water quality for the Sacramento–San Joaquin River Delta. Activities that would be covered under the BDCP include water supply operations related to the State Water Project and the Central Valley Project, and the power plant operations of the Mirant Corporation. Under the BDCP, water users would pay for new infrastructure, wetlands restoration, and other related projects in return for guaranteed stable water supplies. As the BDCP is still under development and is not yet adopted, no determination regarding potential conflicts of the WSIP with its provisions has been made.

Tuolumne Wild and Scenic River Management Plan

The *Tuolumne Wild and Scenic River Management Plan* (Wild and Scenic Plan) was approved in 1986 and is administered by the U.S. Forest Service, Pacific Southwest Region. The Wild and Scenic Plan, applicable only to the 29 miles of the Tuolumne Wild and Scenic River located outside of Yosemite National Park (see Figure 5.2-1), provides direction for managing the use of federal lands within the boundaries of the designated corridor and for protecting the unique qualities of the designated river. The Wild and Scenic Plan does not apply to the exercise of the CCSF's water rights under the existing Raker Act grant, as stated in the Wild and Scenic Rivers Act (Section 3 [a] [53] Tuolumne, California) as follows: "Nothing in this section is intended or shall be construed to affect any rights, obligations, privileges, or benefits granted under any prior authority of law including chapter 4 of the Act of December 13, 1913, commonly referred to as the Raker Act (38 Stat. 242) and including any agreement or administrative ruling entered into or made effective before the enactment of this paragraph [September 28, 1984]."

The Wild and Scenic Plan includes general management objectives and guidelines applicable to the entire designated corridor as well as reach-specific management prescriptions and recreational improvement opportunities assigned to particular management areas. All land uses within the designated corridor are subject to the provisions of the Wild and Scenic Plan. Selected management objectives, standards, and guidelines applicable to the entire designated corridor are listed below.

Management Objectives

Physical Setting Opportunities – Fish and Wildlife

1. Provide habitat for management of indicator species including threatened, endangered, and sensitive species. These include peregrine falcon, bald eagle, mule deer, western gray squirrel, yellow warbler, and Sierra Nevada red fox.

Physical Setting Opportunities – Timber

1. Manage vegetation to protect and enhance Wild and Scenic River values, placing special emphasis on protecting streamside vegetation.

Physical Setting Opportunities – Water

1. Maintain or improve the existing high water quality for fisheries, aesthetics, and other ecological considerations. Give priority to protection of water quality in cases of conflict with other resource uses. Prevent alteration of natural channels or stream banks that would significantly affect the free-flow of water, the appearance of the stream, fish habitat, or water quality.

Physical Setting Opportunities – Lands

2. Work with proponents and operators of hydroelectric projects outside of the corridor to provide mitigation to eliminate or minimize adverse environmental impacts and to provide for recreation opportunities created by the project that will meet the objectives of this management plan.

Managerial Setting Opportunities

5. Manage the Tuolumne Wild and Scenic River and its immediate environment to preserve its free-flowing condition and to protect its outstandingly remarkable values.[3] Provide opportunities for public recreation and other resources based on the classification of each river segment.

Standards and Guidelines

Fish and Wildlife

- Fish and Wildlife Habitat Coordination (C1-WS). Maintain and enhance habitat for fish and wildlife species.

- Stream Fisheries Habitat Improvement and Maintenance (C2-WS). Provide medium- to high-quality habitat for resident trout species (rainbow, brown, and brook) according to the habitat capability model.

- Riparian and Meadow Vegetation Management (C4-WS). Provide cover and forage for fish and wildlife species associated with riparian habitats by maintaining medium- to high-habitat quality according to the Habitat Quality Criteria for Riparian Habitat.

Specific impacts on potentially affected resources covered in this plan—including water, fish and wildlife, vegetation, recreational, and visual resources—resulting from implementation of the proposed WSIP water supply and system operations are analyzed in this chapter in the corresponding subsections of Section 5.3.

Tuolumne Wild and Scenic River Comprehensive Management Plan, General Management Plan for Yosemite National Park, and Wilderness Management Plan

The NPS is currently in the process of preparing a comprehensive management plan for the 54 miles of designated wild and scenic river within Yosemite National Park, as mandated by the Wild and Scenic Rivers Act. This reach of designated river includes portions of the river extending from the Tioga Pass Entrance and Lyell Canyon to the Poopenaut Valley, as shown in Figure 5.2-1. The lands immediately surrounding Hetch Hetchy Reservoir are not included in the plan area; environmental stewardship of these lands is the responsibility of the SFPUC and is performed in coordination with the NPS, as described in Chapter 2, Section 2.3.8. However, the six-mile reach of the Tuolumne River, downstream of Hetch Hetchy Reservoir, that passes through the Poopenaut Valley is covered under this plan.

[3] Outstandingly remarkable values are defined by the Wild and Scenic Rivers Act as the unique characteristics that make a river worthy of special protection.

The intended purpose of the plan currently under development, known as the *Tuolumne Wild and Scenic River Comprehensive Management Plan* (Tuolumne River Plan), is to establish the overall goals and vision for the river corridor. It will provide broad, conceptual-level management objectives that may amend the *General Management Plan for Yosemite National Park* (1980) for the river corridor. The Tuolumne River Plan is not intended to include specific implementation strategies or plans. Concurrent with the Tuolumne River Plan, the NPS is also developing an implementation plan for Tuolumne Meadows that will be guided by the Tuolumne River Plan. Public scoping related to development of the two plans was completed in September 2006, and the draft environmental impact statement is scheduled for release in 2008, with the final report expected in 2009 (NPS, 2006b, 2007).

As part of the development of the Tuolumne River Plan, the NPS developed a draft report entitled *Tuolumne Wild and Scenic River Outstandingly Remarkable Values* (NPS, 2006a). This report presents the proposed revision of the outstandingly remarkable values for the portion of the Tuolumne Wild and Scenic River within Yosemite National Park. Outstandingly remarkable values are identified for natural (ecologic, hydrologic, geologic, and biologic), sociocultural (prehistoric, historic, scenic, and recreational), and scientific values by river segment and for the corridor as a whole. A final report will incorporate comments received during public scoping and review of the draft Tuolumne River Plan and become the foundation for the final Tuolumne River Plan. The *Outstandingly Remarkable Values* includes specific description of cultural, historic, hydrologic, geologic, biologic, scenic, and recreational attributes of the reach of the Tuolumne River below Hetch Hetchy Reservoir, including the Poopenaut Valley, potentially affected by the proposed water supply and system operations.

Much of the area around the Tuolumne River is federally designated as wilderness and is covered under the NPS's *Wilderness Management Plan*. The general guidance and direction for the *Wilderness Management Plan* currently derive from the *General Management Plan for Yosemite National Park*, the Wilderness Act, and NPS policy. When the *Wilderness Management Plan* is updated, the NPS will incorporate guidance and direction established by the Tuolumne River Plan.

Although the Tuolumne River Plan is still under development, specific impacts on potentially affected resources to be covered in the plan—including water, biological, recreational, and visual resources—resulting from implementation of the proposed WSIP water supply and system operations are analyzed in this chapter in the corresponding subsections of Section 5.3.

Vernalis Adaptive Management Program

The VAMP, a product of the San Joaquin River Agreement and officially initiated as part of SWRCB Decision 1641, is a 12-year experimental adaptive management program to study the effects of alterations in San Joaquin River flows and Delta pumping rates on the migration of salmon within the San Joaquin River basin. Under the VAMP, a barrier was installed at the head of Old River, and different amounts of water are released down the San Joaquin River, curtailing exports from the Delta by the State Water Project and Central Valley Project to varying degrees for one month in the spring when juvenile salmon are migrating. Information on the effects of different river flow and export rates on migrating salmon is being gathered and may be used to

establish future standards for their protection. The VAMP is administered by the parties to the San Joaquin River Agreement, including the U.S. Bureau of Reclamation, DWR, CDFG, USFWS, and San Joaquin River Group Authority.

The VAMP is discussed in this chapter because the WSIP would affect flows in the Tuolumne River, a tributary to the San Joaquin River and the Sacramento–San Joaquin Delta. Specific impacts on potentially affected resources covered in this plan—including flows in the San Joaquin River—resulting from implementation of the proposed WSIP water supply and system operations are discussed in Section 5.3.1 of this chapter. The VAMP is not an adopted plan, but rather a temporary experimental program; however, it is expected that either the VAMP or a "VAMP-like" program will be continued when the current program expires.

Habitat Restoration Plan for the Lower Tuolumne River Corridor

Under the 1995 FERC Settlement Agreement (described above and in Chapter 2, Section 2.5.2), the TRTAC is responsible for developing and implementing a Chinook salmon restoration plan and salmon management and habitat restoration activities as part of the strategy to address a decline in fall-run Chinook salmon in the lower Tuolumne River (FERC, 1996). The *Habitat Restoration Plan for the Lower Tuolumne River Corridor* (TRTAC, 2000) is a technical resource document, not an adopted plan, intended to aid the TRTAC in identifying areas of potential habitat improvement and in restoring or rehabilitating these areas.

The restoration plan integrates salmon ecology and geomorphic and hydrologic processes into a riverwide and reach-specific plan. The plan includes goals and strategies to guide future management, specific monitoring objectives, a comprehensive list of all potential restoration sites and actions, and conceptual designs for 14 high-priority restoration projects.

The restoration plan describes how cumulative water storage and diversion projects in the lower Tuolumne River watershed have led to a reduction in annual water yield below La Grange Dam, reductions in the magnitude and variability of the annual hydrograph,[4] and a reduction in the magnitude, duration, and frequency of winter floods. The restoration plan promotes the recovery of Chinook salmon and the river's natural animal and plant communities through the reestablishment of fluvial geomorphic functions, processes, and characteristics. The plan includes the following riverwide restoration goals for the Tuolumne River:

- A continuous river floodway from La Grange Dam to the confluence of the San Joaquin River
- A continuous riparian corridor from La Grange Dam to the San Joaquin River confluence, with a minimum width of 500 feet and a width of up to 2,000 feet near the San Joaquin River
- A dynamic alluvial channel maintained by flood hydrographs of variable magnitude and frequency adequate to periodically initiate geomorphic processes
- The establishment of variable stream flows to benefit salmon and other aquatic resources

[4] A chart that illustrates the pattern of flow in a stream as a function of time.

- Chinook salmon habitat created and maintained by natural processes, sustaining a resilient, naturally reproducing Chinook salmon population

- Self-sustaining, dynamic, native woody riparian vegetation

- Continual revision of the adaptive management program, addressing areas of scientific uncertainty that will improve our understanding of river ecosystem processes and refine future restoration and management

Specific impacts on potentially affected resources covered in this plan—including water, geomorphological, biological, recreational, and visual resources—resulting from implementation of the proposed WSIP water supply and system operations are addressed in this chapter in the corresponding subsections of Section 5.3, and information from this plan is used as a resource for mitigation strategies.

Water Quality Control Plans

Each RWQCB is required to develop, adopt, and implement a Water Quality Control Plan (WQCP), also known as a Basin Plan, for its respective region. The WQCP is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation. WQCPs identify beneficial uses of surface waters and groundwater within the corresponding region; specify water quality objectives and standards for both surface water and groundwater; and develop the actions necessary to maintain the standards in order to control nonpoint and point sources of pollutants to the state's waters.

WQCPs are adopted and amended by the RWQCBs and approved by the SWRCB. Adoption of or revisions to the surface water objectives/standards contained in the WQCPs are subject to U.S. EPA approval. All discretionary projects requiring permits from the RWQCB (i.e., waste discharge requirements and National Pollutant Discharge Elimination System permits) must implement WQCP requirements, taking into consideration the beneficial uses to be protected.

Two adopted WQCPs govern the management of surface and ground waters that could be affected by proposed WSIP system operations. The Central Valley WQCP covers the Sacramento and San Joaquin River basins, including the Tuolumne River watershed. The San Francisco Bay/Delta WQCP covers those portions of Alameda, Contra Costa, Marin, Napa, San Mateo, San Francisco, Santa Clara, Solano, and Sonoma Counties that drain to the San Francisco Bay Estuary, including the Delta, as well as areas draining to the Pacific Ocean; this plan includes the Alameda Creek watershed, the Peninsula watershed (including San Mateo and Pilarcitos Creeks), and the Westside Groundwater Basin. Water objectives/standards contained in the WQCPs are enforceable against the SFPUC. Specific impacts on water quality associated with implementation of the proposed WSIP water supply and system operations are analyzed by watershed in Sections 5.3.3, 5.4.3, and 5.5.3 of this chapter.

San Francisco Bay Plan

The SF Bay Plan, completed and adopted by BCDC in 1968, is an enforceable plan that guides the protection and use of San Francisco Bay and its shoreline. For a discussion of the SF Bay Plan's applicability to individual WSIP facility projects, see Section 4.2 (Vol. 2, Chapter 4, p. 4.2-16).

The SF Bay Plan is founded on the belief that water quality in San Francisco Bay will be maintained at levels sufficiently high to protect the beneficial uses of the bay. The SF Bay Plan includes findings and policies related to freshwater inflow and changes in salinity. The freshwater inflow findings contained in the SF Bay Plan stress the importance of maintaining a balance between fresh and saltwater. The related policies assert that the impact of freshwater diversions should be monitored by the SWRCB to ensure compliance with water quality standards.

Regional Habitat Conservation Plans

Habitat conservation plans (HCPs) are land use and biological planning documents that provide comprehensive, long-term conservation measures for species listed as threatened or endangered under the California and Federal Endangered Species Acts, or for species that could be listed in the future. One adopted HCP covering an area that could be affected by WSIP implementation was identified (see separate discussion below of SFPUC HCPs). In 1995, the City of Waterford prepared an HCP for the incidental take of valley elderberry longhorn beetle (VELB) on the Tuolumne River at the discharge point of its wastewater treatment facility, located between La Grange Dam and the city of Modesto. The HCP involved the removal of about 150 elderberry bushes on five acres and the installation of over 800 small bushes.

Alameda Creek Watershed Management Planning Efforts

Multiple stakeholders in the Alameda Creek watershed area, including the SFPUC, Alameda County Water District, ACFCWCD, Zone 7, EBRPD, and various environmental interest groups, are involved in ongoing planning efforts to manage the Alameda Creek watershed. Although no specific plans have been adopted, planning efforts include the development of a comprehensive management plan for the watershed; the plan, which is being prepared in conjunction with the Alameda Creek Fisheries Restoration Workgroup, will focus on restoring steelhead to the Alameda Creek watershed. In October 2006, 17 public agencies and nonprofit organizations[5] signed a formal agreement to collaborate on stream flow requirements for steelhead, other native fish and wildlife, and drinking water supplies (Alameda Creek Fisheries Restoration Workgroup, 2006). This planning effort is discussed in the Alameda Creek watershed fisheries section and in cumulative analysis of the WSIP water supply and system operations, in Sections 5.4.5 and 5.7, respectively.

[5] Participating organizations in the Alameda Creek Fisheries Restoration Workgroup include: the Alameda County Water District, Alameda County Flood Control and Water Conservation District, Alameda Creek Alliance, Coastal Conservancy, Zone 7, Pacific Gas and Electric Company, SFPUC, Alameda County Resource Conservation District, American Rivers, California Department of Fish and Game, East Bay Regional Park District, National Marine Fisheries Service, Natural Resources Defense Council, San Francisco Bay Regional Water Quality Control Board, U.S. Army Corps of Engineers, U.S. Natural Resources Conservation Service, and U.S. Fish and Wildlife Service.

Pilarcitos Creek Watershed Restoration Plan

Developed in coordination with the California Department of Fish and Game, Regional Water Quality Control Board, and a citizen's advisory committee, the *Pilarcitos Creek Restoration Plan* (Philip William & Associates, Ltd., 1996) details the major issues of concern regarding Pilarcitos Creek and its tributaries, and prioritizes alternatives to significantly enhance the physical and biological attributes of the watershed. The alternatives involve reducing sedimentation in the creek and its tributaries, enhancing fish migration and rearing and riparian habitat, and providing educational resources. Not an adopted plan, this document and its subsequent updates serve as a guide to restoration projects and related activities in the Pilarcitos watershed. It is considered in this chapter with respect to providing documentation of existing conditions in the Pilarcitos watershed and potential mitigation strategies for potential impacts associated with the WSIP water supply option and system operations.

Pilarcitos Creek Integrated Watershed Management Plan

The Pilarcitos Creek Restoration Workgroup[6] is currently developing the *Pilarcitos Creek Integrated Watershed Management Plan,* the intended purpose of which is to "determine how to more effectively manage the competing beneficial uses of water from Pilarcitos Creek and promote balanced solutions that satisfy environmental, public health, recreational, and economic interests. An important component of the plan will be an assessment of existing conditions and a strategy for addressing the actions necessary for the protection and restoration of [steelhead trout] and other species of concern that depend on aquatic and riparian habitats throughout the watershed" (San Mateo County Resource Conservation District, 2006). The plan will build on the 1996 *Pilarcitos Creek Restoration Plan,* and a Memorandum of Understanding has been developed among the 19 participants in the workgroup to outline the process for developing the plan (Pilarcitos Creek Restoration Workgroup, 2007). It is expected that the *Pilarcitos Creek Integrated Watershed Management Plan* will be completed in 2008. This plan is considered in the cumulative analysis of the WSIP water supply and system operations, as discussed in Section 5.7.

City and County of San Francisco Plans and Policies

Chapter 4, Section 4.2, Plans and Policies, provides an overview of the relationship of CCSF planning documents to the WSIP and discusses the specific CCSF plans and policies that pertain to the WSIP facility improvement projects. This section focuses on those plans and polices that relate to the WSIP water supply and system operations.

San Francisco General Plan

Section 4.2.2 provides an overview of the San Francisco General Plan. Although the majority of policies contained in the general plan were developed for lands within San Francisco and are not generally relevant to extraterritorial lands, several policies and objectives provided in the Environmental Protection Element are relevant to the proposed operational changes and sources of water supply under the WSIP. The Fresh Water sub-element of the Environmental Protection Element of the San Francisco General Plan includes objectives aimed at the protection of freshwater resources (Objective 6) in conjunction with responsible utilization of these resources for water supply (Objective 5). Policies associated with the reliability of the regional water system include Policy 5.1 and Policy 5.2. Policy 5.3 and Policy 5.4 address water quality; Policy 6.1 specifies the continued implementation of a leak detection program; and Policy 6.2 deals with water reclamation. The Flora and Fauna sub-element of the Environmental Protection Element deals with the protection of plant and animal life (Objective 8) and specifies the protection of plant and animal species and their habitats through coordination with animal protection programs (Policy 8.1, Policy 8.2, Policy 8.3). Specific impacts on potentially affected

[6] Participating organizations in the Pilarcitos Creek Restoration Workgroup include: the SFPUC, California State Parks, San Mateo County Resource Conservation District, San Francisco Bay Regional Water Quality Control Board, Pilarcitos Creek Advisory Council, City of Half Moon Bay, Coastside County Water District, Committee for Green Foothills, Gulf of the Farallones National Marine Sanctuary, Half Moon Bay Fishermans Association, Midpeninsula Regional Open Space District, California Department of Fish and Game, Monterey Bay National Marine Sanctuary, National Marine Fisheries Service, Peninsula Open Space Trust, Pilarcitos Creek Advisory Committee, San Mateo County Farm Bureau, Sewer Authority Mid-Coastside, and Surfrider Foundation–San Mateo Chapter.

resources covered in this plan—including water and biological resources—resulting from implementation of the WSIP water supply and system operations are analyzed by watershed in the corresponding sections of this chapter.

San Francisco Sustainability Plan

The San Francisco Board of Supervisors endorsed the *San Francisco Sustainability Plan* in 1997, but has not committed the City to perform the actions addressed in the plan. The plan serves as a blueprint for sustainability, with many of its individual proposals requiring further development and public comment. The underlying goals of the plan are to maintain the physical resources and systems that support life in San Francisco and to create a social structure that will allow such maintenance. The plan is divided into 15 topic areas, 10 that address specific environmental issues (air quality; biodiversity; energy, climate change, and ozone depletion; food and agriculture; hazardous materials; human health; parks, open spaces and streetscapes; solid waste; transportation; and water and wastewater), and five that are broader in scope and cover many issues (economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management). Under the topic "Water," there are goals addressing water reuse, water quality, adequacy of water supply, groundwater supply, and infrastructure. Each topic area in the plan has a set of indicators to be used over time in determining whether San Francisco is moving in a sustainable direction in that particular area (CCSF, 1997).

Specific impacts on potentially affected resources addressed in this plan—including water and groundwater resources—resulting from implementation of the WSIP water supply and system operations are analyzed by watershed in the corresponding sections of this chapter.

San Francisco Urban Water Management Plan

As discussed in *2005 Urban Water Management Plan for the City and County of San Francisco*, approximately 96 percent of the city's total water supply is provided by the SFPUC regional water system. The remaining 4 percent of the water demand is met through locally produced, nonpotable groundwater and secondary-treated recycled water used for irrigation. San Francisco overlies all or part of seven groundwater basins. Of these, only the Westside Basin and the Lobos Basin are considered adequate for municipal supplies. Groundwater pumped from wells located in Golden Gate Park and at the San Francisco Zoo is used by the Recreation and Park Department for irrigation. Tertiary-treated recycled water from the SFPUC's Southeast Water Pollution Control Plant is used on a limited basis for washdown operations.

The 2005 UWMP identifies various local water supply plans and programs that represent potential options to maximize resources and minimize the need to import water. These include ongoing implementation of water conservation programs; implementation of the *Recycled Water Master Plan* (SFPUC, 2006a), which explores additional opportunities for recycled water use in San Francisco; and implementation of the *Draft North Westside Basin Groundwater Management Plan*, which identifies several new local groundwater projects to produce an additional 2 million gallons per day of groundwater for potable purposes (SFPUC, 2005).

Information in the UWMPs of both the retail and wholesale customers of the regional water system, including the CCSF and applicable Bay Area Water Supply and Conservation Agency members, was used in the development of the WSIP level of service water supply goal for 2030.

SFPUC Watershed Management Plans

The SFPUC has adopted watershed management plans for CCSF-owned lands in the Alameda and Peninsula watersheds to provide a policy framework for activities and actions on watershed lands. Watershed lands are managed by the SFPUC Natural Resources Division, Land and Resource Management Section. The plans provide goals, policies, and management actions that address watershed activities and reflect the unique qualities of each watershed. Changes in system operations proposed under the WSIP would be required to conform to the goals, policies, and management actions contained in the Alameda and Peninsula Watershed Management Plans (WMPs) as well as applicable environmental codes and regulations. Specific impacts on affected resources covered in these plans—including water, biological, recreational, and visual resources—resulting from implementation of the WSIP water supply and system operations are analyzed for the Alameda and Peninsula watersheds in the corresponding sections of this chapter.

For both watershed plans, the SFPUC considers water quality protection as the first and foremost goal. The goals and policies are organized around the primary goal of water quality protection and six secondary goals pertaining to water supply, natural resource protection, watershed protection, land use compatibility, fiscal management, and public awareness. The primary and secondary goals were established by the Watershed Planning Committee, a group of SFPUC division and department representatives who assisted in plan development and review. The primary and secondary goals in common to both watershed management plans are as follows:

- *Primary Goal*: Maintain and Improve Source Water Quality to Protect Public Health and Safety

- *Secondary Goals*:
  - Maximize water supply
  - Preserve and enhance the ecological and cultural resources of the watershed
  - Protect the watersheds, adjacent urban areas, and the public from fire and other safety hazards
  - Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, and scientific uses
  - Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits and an administrative framework that allows implementation of the watershed management plans
  - Enhance public awareness of water quality, water supply, conservation, watershed protection issues

Alameda Watershed Management Plan

The SFPUC's Alameda WMP is described in Chapter 4, Section 4.2, in the context of WSIP facilities improvement projects located in the Alameda watershed. The Alameda watershed lands are shown in Figure 2.2. The Alameda WMP provides a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on CCSF-owned lands in the Alameda watershed to protect the watershed and ensure a pure and reliable supply for San Francisco. The plan applies best management practices for the protection of water and natural resources and their conservation, enhancement, restoration, and maintenance and is intended to be used by the SFPUC as watershed management implementation guidelines.

Peninsula Watershed Management Plan

The SFPUC's Peninsula WMP is described in Chapter 4, Section 4.2, in the context of WSIP facilities improvement projects located in the Peninsula watershed. The Peninsula watershed lands are shown in Figure 2.3.The Peninsula WMP was developed in the same manner as the Alameda WMP and consists of the same primary and secondary goals as those contained in the Alameda WMP; however, some policies contained in the plan have been formulated to address the specific management issues of the Peninsula watershed.

SFPUC Habitat Conservation Plans

As part of watershed management plan implementation, the SFPUC is in the process of developing HCPs for the Alameda and Peninsula watersheds, as discussed in Chapter 4, Section 4.2. Both watersheds contain known habitat for sensitive species, and the HCPs are being developed in compliance with federal and state regulations for endangered species protection. The draft HCP for the Alameda watershed is scheduled for public review in 2007, and the draft HCP for the Peninsula watershed is scheduled for public review in 2008. Both plans will require preparation of a joint environmental impact report/environmental impact statement before the SFPUC can consider adoption and begin implementation. (See Chapter 4, Section 4.2, for additional information regarding the development of HCPs for the SFPUC Alameda and Peninsula watersheds.)

Although the HCPs are still under development, specific WSIP impacts on the resources anticipated to be covered in the plans—particularly steelhead and other federal- or state-listed biological resources—are analyzed for the Alameda and Peninsula watersheds in the corresponding sections of this chapter.

SFPUC Water Enterprise Environmental Stewardship Policy

Adopted in June 2006, the Water Enterprise Environmental Stewardship Policy established the long-term management direction for CCSF-owned lands and natural resources affected by operation of the SFPUC regional water system within the Tuolumne River, Alameda Creek, and Peninsula watersheds (SFPUC, 2006b). It also addresses rights-of-way and properties in urban surroundings under SFPUC management. The policy includes the following specifically relevant to the proposed water supply and system operations:

- The SFPUC will proactively manage the watersheds under its responsibility in a manner that maintains the integrity of the natural resources, restores habitats for native species, and enhances ecosystem function.

- To the maximum extent practicable, the SFPUC will ensure that all operations of the SFPUC water system (including water diversion, storage, and transport), construction and maintenance of infrastructure, land management policies and practices, purchase and sale of watershed lands, and lease agreements for watershed lands protect and restore native species and the ecosystems that support them.

- It is the policy of the SFPUC to operate the SFPUC water system in a manner that protects and restores native fish and wildlife downstream of SFPUC dams and water diversions, within SFPUC reservoirs, and on SFPUC watershed lands.

- Releases from SFPUC reservoirs will mimic the variation of the seasonal hydrology (e.g., magnitude, timing, duration, and frequency) of their corresponding watersheds in order to sustain the aquatic and riparian ecosystems upon which these native fish and wildlife species depend (consistent with the SFPUC mission, existing agreements, and applicable state and federal laws).

- The SFPUC will actively monitor the health of the terrestrial and aquatic habitats, both under SFPUC ownership and affected by SFPUC operations, in order to continually improve ecosystem health.

The Environmental Stewardship Policy calls for implementation and update of the Alameda and Peninsula WMPs (described above), development of habitat conservation plans for the Alameda and Peninsula watersheds (described above), and development and implementation of the Watershed Environmental Improvement Program (described in Chapter 3, Section 3.12, WSIP-Related Activities), as well as specific integration of this policy into the WSIP and individual infrastructure projects.

General Plans of Potentially Affected Counties

Chapter 4, Section 4.2.2, describes the applicability of city and county general plan policies to the WSIP facility improvement projects; much of that discussion also applies to the proposed WSIP water supply and system operations. No local agency approvals other than those of the CCSF are expected to be needed for the proposed water supply and system operations (see Chapter 3, Section 3.13). Any county required to determine consistency of a part of the WSIP with their general plan pursuant to California Government Code 65402(b) would be notified by the SFPUC prior to implementation. Notwithstanding the limited authority of cities and counties over implementation of the WSIP, where CCSF-owned facilities are sited and operated outside of San Francisco, the SFPUC seeks to work cooperatively with cities and counties to avoid conflicts with local plans and policies. For the WSIP, a key issue for local agencies that receive all or part of their water from the SFPUC is whether the WSIP adequately addresses community goals regarding water service for existing and future land uses; this topic is addressed in Section 4.2.3. A second issue of importance to local agencies is whether implementation of the WSIP would be consistent with community goals regarding resource protection. Counties in which WSIP

operations could result in surface water or groundwater hydrology impacts and/or secondary biological effects include the following:

- Tuolumne
- Stanislaus
- Alameda
- San Joaquin
- Santa Clara
- San Mateo

Table 5.2-2 presents an overview of policies and goals from these counties' general plans that address water resources management and biological resources. The issues shown in the table are addressed in the impact analyses presented in Chapter 5. The only significance criterion applicable to the impact analysis in Chapter 5 regarding WSIP compatibility with certain aspects of local land use plans and polices is "Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan." This impact is analyzed in Sections 5.3.7, 5.4.6, and 5.5.6, Terrestrial Biological Resources in the Tuolumne, Alameda Creek, and Peninsula watersheds, respectively.

TABLE 5.2-2
SUMMARY OF GENERAL PLAN POLICIES OF COUNTIES WITH SURFACE WATER AND GROUNDWATER RESOURCES POTENTIALLY AFFECTED BY THE PROPOSED WSIP WATER SUPPLY AND SYSTEM OPERATIONS

Resource Area	Summary Description of General Plan Policy
Water Resources Management	Preserve water resources for all beneficial uses of water; ensure the adequate quantity and quality of water for municipal and industrial uses, agriculture, recreation, fish and wildlife, and Delta outflows for salinity repulsion.
	Recognize surface water resources of state and national significance for which environmental and scenic values must be protected; minimize alteration of natural water bodies; support "properly timed, sufficient flows" in rivers.
	Protect groundwater resources.
Biological Resources	Develop comprehensive watershed management plans to assure that cumulative impacts on water quality, reservoir operations, and watershed resources are addressed and mitigated.
	Recognize and protect resources of significant biological and ecological importance; protect habitats of rare and endangered fish and wildlife species; maintain adequate stream/river flows for salmon migration; protect fish and wildlife habitat and recreational uses when implementing water diversion projects; require that water projects contain safeguards to protect fish and wildlife; design public projects to avoid damage to freshwater and stream environments; require mitigation of impacts on sensitive areas (e.g., riparian habitats, vernal pools, rare plants, flyways, and other waterfowl habitats); restore freshwater habitats.
	Protect and restore natural resources like wetlands and riparian areas; achieve a "no net loss" of wetland areas through avoidance, protection, and appropriate mitigation; protect riparian habitat along rivers and natural waterways; address potential impacts on waterways and wetlands resulting from increased erosion and siltation.

Specific impacts on affected resources addressed in these plans—including water, biological, recreational, and visual resources—resulting from implementation of the WSIP water supply and system operations are analyzed by watershed in the corresponding sections of this chapter.

5.2.4 Plan Consistency Evaluation

The evaluation of plan/policy consistency in this section is based on the applicability of adopted plans and policies to the proposed WSIP water supply and system operations and associated effects. The consistency evaluation in this PEIR represents the best attempt to advise the decision-makers as to whether the proposed program is consistent with applicable *adopted* land use and resource plans and policies. No consistency determination is made for draft plans/policies, plans in development, guidance/planning documents, or agreements. However, the resources addressed in the draft plans/policies or guidance/planning documents are evaluated in the impact analyses in the appropriate sections of this chapter. In general, implementation of the WSIP would be consistent with natural resource and other applicable plans described in Section 5.2.3, particularly with respect to the WSIP sustainability goal of managing natural resources and physical systems to protect watershed ecosystems and with implementation of mitigation measures identified in this PEIR.

Consistency with Regional Natural Resource Protection Plans

WQCPs [water quality control plans] identify water quality issues and prescribe enforceable water quality objectives/criteria for specific water bodies and their tributaries. Because these standards are based on designated beneficial uses of the respective waterways, violation of the water quality objectives/criteria can adversely affect fish, wildlife, and other protected resources. SFPUC operations currently comply with water quality standards contained in the WQCPs, and the WSIP goals and objectives would be consistent with the applicable WQCPs. Further, as future SFPUC operations would be consistent with the water quality standards contained in the WQCPs, SFPUC operations would also be consistent with the SF Bay Plan freshwater inflow policies. The potential impacts of WSIP implementation on water quality in the Tuolumne River watershed and Sacramento–San Joaquin Delta, Alameda Creek watershed, Peninsula watershed, and Westside Groundwater Basin are analyzed in Sections 5.3.3, 5.4.3, 5.5.3, and 5.6, respectively.

One adopted HCP covering an area that could be affected by WSIP implementation was identified; this plan was prepared by the City of Waterford for the incidental take of valley elderberry longhorn beetle (VELB) on the Tuolumne River at a location between La Grange Dam and Modesto. The goals and objectives of the WSIP would be consistent with this HCP, and, as described in Section 5.3.7, implementation of the WSIP would not adversely affect the VELB or elderberry population in this plan area.

Consistency with CCSF Plans and Policies

San Francisco General Plan

The San Francisco General Plan provides general environmental resource policies related to the protection of natural resources, including freshwater resources. The WSIP goals and objectives would be consistent with the goals and objectives of this plan, and more specifically with policies related to freshwater resources. The impact analyses presented in Sections 5.3 through 5.7 of this chapter assess the potential for physical environmental impacts from implementation of the WSIP water supply and system operations. The impact analyses identify a variety of potentially significant physical impacts under all environmental topics, but, as described in those sections,

many of these impacts would be reduced to a less-than-significant level with implementation of mitigation measures and compliance with applicable regulations, as outlined in Chapter 6.

San Francisco Sustainability Plan

The *San Francisco Sustainability Plan* was developed for the purpose of addressing San Francisco's long-term environmental sustainability. Water supply goals relevant to the WSIP deal with ensuring a sustainable and adequate water supply; maximizing public health by providing safe drinking water; ensuring public input into the water planning process; restoring and enhancing groundwater supplies; and upgrading infrastructure in a timely and environmentally sound manner. The WSIP water supply and system operations, and particularly the WSIP sustainability objective, would be consistent with the goals of the Sustainability Plan. The WSIP would be consistent with goals pertaining to increasing water reuse, ensuring an adequate water supply under normal and extraordinary conditions, restoring groundwater supplies, and upgrading infrastructure.

San Francisco Urban Water Management Plan

The *2005 Urban Water Management Plan for the City and County of San Francisco* evaluates regional water system reliability and the SFPUC's existing and planned sources of water supply. The plan describes demand management measures to be implemented and provides an implementation strategy and schedule for future planned projects and schedules. Information in the UWMP was used in the development of WSIP levels of service and complements the operational strategy and future water supplies proposed under the WSIP. Therefore, the WSIP is and would be inherently consistent with the UWMP.

Consistency with Adopted SFPUC Plans and Policies

Alameda and Peninsula Watershed Management Plans

Watershed management plans prepared by the SFPUC for the purpose of water resource management and planning provide much of the framework used in the development of various components of the WSIP. The Peninsula and Alameda WMPs are designed to improve the SFPUC's ability to protect its overall watershed as well as the specific resources that make up the watershed. The WMPs include goals and policies related to maximizing the local water supply and improving source water quality to protect public health and safety; these goals are aligned with the goals of the WSIP. As part of implementing the WMPs, the SFPUC Natural Resources Division will review WSIP activities proposed within these watersheds for conformity with the WMPs as well as for compliance with environmental codes and regulations; thus, changes in system operations proposed under the WSIP would be reviewed for conformity with the goals, policies, and management actions contained in the Alameda and Peninsula WMPs. Overall, the WSIP would be consistent with the WMPs. Potential impacts of WSIP system operations on water quality and biological resources in the Alameda and Peninsula watersheds are described in Sections 5.4 and 5.5 of this chapter.

SFPUC Water Enterprise Environmental Stewardship Policy

The WSIP would be consistent with the underlying goals of the Water Enterprise Environmental Stewardship Policy, particularly with respect to the WSIP sustainability goal and the WSIP objective to manage natural resources and physical systems to protect watershed ecosystems. The Stewardship Policy implementation strategy specifically calls for integration of the policy into the WSIP. However, implementation of the proposed water supply and system operations would affect stream flow in the Tuolumne River, Alameda Creek, and Peninsula watersheds, as analyzed and described in Sections 5.3.1, 5.4.1, and 5.5.1. This operational change and resultant effects on stream flow could in turn affect native fish and wildlife downstream of SFPUC dams and water diversions, within SFPUC reservoirs, and on SFPUC watershed lands. Impacts on fisheries and the terrestrial biological resources in the Tuolumne River, Alameda Creek, and Peninsula watersheds are analyzed in Sections 5.3.6, 5.3.7, 5.4.5, 5.4.6, 5.5.5, and 5.5.6. Mitigation measures described in Chapter 6 identify operational approaches to managing releases from SFPUC reservoirs and other measures to reduce impacts on fisheries and other biological resources.

Consistency of WSIP Operations with the General Plans of Potentially Affected Counties

Overall, the WSIP water supply and system operations would be generally consistent with the community goals related to water resources protection described above. Through preparation of this PEIR and attendant scoping and public outreach efforts, the CCSF has systematically identified significant environmental impacts associated with the WSIP as well as feasible measures and alternatives to avoid or substantially lessen such effects. The impact analyses presented in this PEIR reflect the intent of general plan policies related to the protection of water resources. As detailed throughout the rest of Chapter 5, most of the environmental impacts associated with the proposed water supply and system operations would be reduced to a less-than-significant level with measures proposed as part of the WSIP or otherwise committed to by the SFPUC.

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