6 Mitigation Measures

CHAPTER 6
Mitigation Measures

6.1 Introduction

This chapter presents mitigation measures for impacts associated with implementation of the proposed program as identified in Chapters 4 and 5 of this PEIR. Chapter 4 identifies impacts that would be associated with construction and operation of WSIP facility improvement projects, while Chapter 5 identifies impacts that would result from the proposed water supply and system operations. In these chapters, the level of significance is indicated for each impact; these determinations are one of the following: N/A (not applicable), B (Beneficial, no mitigation required), LS (Less than Significant, no mitigation required), PSM/SM (Potentially Significant/Significant, can be mitigated to less than significant), LSM (Less than Significant, since it would be mitigated with program-level mitigation measures) PSU/SU (Potentially Significant Unavoidable/Significant and Unavoidable, where mitigation would not necessarily reduce the impact to less than significant). The significance determinations are based on the potential effects of the proposed program as they relate to the significance criteria listed in Chapters 4 and 5, with consideration of how SFPUC construction measures and regulatory requirements may reduce the severity of the effect. Mitigation measures are then identified for all impacts determined to be PSM as well as for impacts determined to be PSU or SU, to the extent that any feasible mitigation would be available. The detailed descriptions of all mitigation measures are included in this chapter.

Section 6.2 of this chapter presents the SFPUC construction measures that will be applied to all WSIP facility improvement projects; Section 6.3 describes the mitigation measures to minimize facilities-related impacts; and Section 6.4 describes the mitigation measures to minimize water supply and system operations impacts. All mitigation measures are numbered to correspond to impact numbers presented in Chapters 4 and 5; in some cases where the same measure would mitigate more than one impact, the measure number corresponds to the first impact identified. In a few cases, implementation of the mitigation measures in and of themselves could result in additional environmental effects, and therefore, Section 6.5 includes a general description of impacts of those mitigation measures. Section 6.6 presents summary tables of all impacts and mitigation measures, showing which measures apply to which impact.

For the facilities-related mitigations, Section 6.3 presents the detailed text of the mitigation measures by environmental topic for all PSM/SM and PSU/SU impacts identified in the Chapter 4 analysis. The summary tables in Section 6.6 list all impacts analyzed in Chapter 4 and provides the mitigation information as applicable to each facility improvement project, including the impact statement, the significance determination, applicable SFPUC construction measure, PEIR mitigation measure, and regulations that reduce the severity of the impact. For some projects, an identified impact would not apply (N/A). For some projects, the impact would be LS with implementation of applicable SFPUC construction measures, though in a few cases, the identified impact would be LS without implementation of the SFPUC construction measures. For impacts determined to be PSM/SM, the mitigation measures described in Section 6.3 must be implemented to reduce potentially significant impacts to a less-than-significant level. For impacts determined to be PSU or SU, implementation of mitigation measures would still be required, but it has been determined that these measures would not reduce the identified impact to a less-than-

significant level.[1] Section 6.3 identifies the appropriate program-level mitigation measures in general terms, referred to as "Program Measures," that would apply to impacts identified for individual facilities improvement projects. Section 6.3 also presents "Collective Measures" and "Cumulative Measures," which would reduce collective and cumulative impacts, respectively, and would apply to the WSIP by region or as a whole.

For the water supply/system operations mitigations, Section 6.4 presents the detailed text of the mitigation measures by watershed/groundwater basin for all PSM/SM and PSU/SU impacts identified in the Chapter 5 analysis. The summary tables in Section 6.6 list all impacts analyzed in Chapter 5 together with the significance determinations and the mitigation measures for PSM, PSU, and SU impacts. Similar to the facilities impact analysis, for impacts determined to be PSM, the mitigation measures described in Section 6.4 must be implemented to reduce potentially significant impacts to a less-than-significant level. For impacts determined to be PSU and SU, implementation of mitigation measures would still be required, but it has been determined that these measures would not reduce the identified impact to a less-than-significant level.[2] Section 6.4 identifies water supply/system operations mitigation measures which apply to the WSIP as a whole and are referred to as "System Measures."

CEQA Section 15126.4 states that an EIR shall distinguish between the mitigation measures which are proposed by project sponsor to be included in the project and the measures that are identified in the EIR as proposed by the lead agency. At this time, the SFPUC intends to incorporate all mitigation measures presented in this PEIR into the implementation of the WSIP, if approved, and therefore all measures are considered to be proposed by the project sponsor except in the following cases:

- If any of the project-level EIRs completed on WSIP facility improvement projects finds a different impact determination and deems a PEIR mitigation measures unnecessary
- If any of the project-level EIRs determines that a project-specific mitigation measure would be more appropriate than a PEIR mitigation measure once the impact is more fully analyzed with additional project-level details

In the above cases, the SFPUC may not need to provide mitigation due to less-than-significant impact findings, or may chose to implement alternative mitigation measures identified in the project-level EIRs.

1 In some cases, a mitigation measure may reduce an impact but because there is no definitive threshold, a less-than-significant determination cannot be made.

2 *Ibid*.

6.2 SFPUC Construction Measures

The following SFPUC standard construction measures apply to all proposed WSIP facility improvement projects. The SFPUC standard construction measures are aimed at minimizing disruptions to surrounding neighborhoods, resources, and land uses during any SFPUC construction, maintenance, or repair activity or project that requires CEQA review. As required by the SFPUC, each project must include the SFPUC standard construction measures in the construction contract or project implementation procedures, as appropriate.

Some of the SFPUC standard construction measures may not be appropriate for certain kinds of projects, but each of the measures must be addressed, either by explaining why the measure is not applicable to the particular site, undertaking the activities listed, or undertaking further investigation and developing a more detailed work plan to address the issue.

1. *Neighborhood Notice*: The SFPUC will provide reasonable advance notification to the businesses, owners and residents of adjacent areas potentially affected by the Water System Improvement Program (WSIP) projects about the nature, extent and duration of construction activities. Interim updates should be provided to such neighbors to inform them of the status of the construction.

   Where schools would be affected, the SFPUC will coordinate with school facility managers to schedule construction for time periods with the least impact on school activities and facilities to ensure student safety and to minimize disruption to educational and recreational uses of the school property.

2. *Seismic and Geotechnical Studies*: Projects will incorporate review of existing information and, if necessary, new engineering investigations to provide relevant geotechnical information about the particular site and project, including a characterization of the soils at the site, and the potential for subsidence and other ground failure. Construction will address any recommendations by such geotechnical reports to ensure seismic stability and reliability of the proposed project. All SFPUC projects must be designed for seismic reliability and minimum potential water loss and property damage. All components of the water system improvement program must be designed to continue water service during a major earthquake.

3. *On-Site Air and Water Quality Measures during Construction*: All construction contractors must take measures to minimize fugitive dust and dirt emissions resulting from the construction, and implement measures to minimize any construction effects on local air and water quality, including a local storm drain system or watercourse. These measures could include preparation of a Stormwater Pollution Prevention Plan (SWPPP), if required by the California Regional Water Quality Control Board. At a minimum, construction contractors should undertake the following measures, as applicable, to minimize any adverse effects:

   - Erosion and sedimentation controls tailored to the site and project
   - Dust control plan
   - Placement of straw rolls around each of the nearby stormwater inlets;
   - Preservation of existing vegetation;
   - Installation of silt fences;

- Use of wind erosion control (e.g. – geotextile or plastic covers on stockpiled soil);
- Sweeping of nearby streets at least once a day; and/or;
- Stabilization of site ingress/egress locations to minimize erosion.
- Spraying the disturbed areas of the site, or any stockpiled soil, with water to minimize fugitive dust emissions.

4. *Groundwater*: If groundwater is encountered during any excavation activities, the construction contractor shall prepare a dewatering plan so that water is discharged to the stormwater system in compliance with the local standards and discharge permit requirements.

5. *Traffic*: Each contractor shall prepare a traffic control plan which will minimize the impacts on traffic and on-street parking on any streets affected by construction of the proposed project. As appropriate, SFPUC or the contractor will consult with local traffic and transit agencies.

6. *Noise*: The contractor will comply with local noise ordinances regulating construction noise to the extent feasible, and will undertake efforts to minimize any noise disruption to nearby neighbors and sensitive receptors during construction.

7. *Hazardous Materials*: Appropriate measures will be implemented to characterize and dispose of hazardous materials should they be encountered during excavation and construction. Contract specifications will mandate full compliance will all applicable local, state and federal regulations related to the identification, transportation and disposal of hazardous materials/soils. As necessary, a spill prevention and countermeasure plan will be prepared.

   A qualified environmental professional will conduct any necessary site assessment. The site assessment would include a regulatory database review to identify permitted hazardous materials and environmental cases in the vicinity of each project no more than three months before construction, and a review of appropriate standard information sources to determine the potential for soil or groundwater contamination to occur. Follow-up sampling would be conducted as necessary to characterize soil and groundwater quality prior to construction and, if needed, site investigations or remedial activities would e performed in accordance with applicable laws. The environmental professional would prepare a report documenting the activities performed, summarize the results and make recommendations for appropriate handling of any contaminated materials during construction. A contingency plan would also be prepared identifying measures to be taken should unanticipated contamination be identified during construction. Construction contractors will conduct asbestos and lead abatement in accordance with established regulations.

8. *Biological Resources*: As an initial matter, SFPUC project managers will screen the project site and area to determine whether biological resources may be affected by construction activities. In the event further investigation is necessary, the SFPUC will comply with all requirements for investigation, analysis and protection of biological resources. A qualified biologist must conduct any required biological screening survey. The biologist will review standard information sources to determine special status species with the potential to occur on the project site. The biologist would carry out a site survey by walking or driving over the project site, as appropriate, to note the general resources and whether any habitat for special-status species is present. The biologist would then document the survey with a brief letter report or memo, setting forth the date of the visit, whether habitat for special-status

species is present, providing a map or description showing where sensitive areas exist within the site, and identifying any appropriate avoidance measures.

9. *Cultural Resources*: As an initial matter, SFPUC project managers will screen the project site and area to determine whether cultural resources, including archaeological and other historical resources, may be affected by construction activities. In the event further investigation is necessary, the SFPUC will comply with all requirements for investigation, analysis and protection of cultural resources.

   CEQA considers paleontological resources to be "cultural resources." Any screening for cultural resources would include screening for archaeological, paleontological and historic resources. For projects requiring excavation, deep grading, well drilling or tunneling into geologic material at sites identified as having high potential for encountering paleontological resources, a state-registered professional geologist or qualified professional paleontologist will conduct a site-specific evaluation of the paleontological sensitivity. The assessment will include a report of findings for the SFPUC.

   A qualified archaeologist, historian or paleontologist will conduct all cultural resources survey and screening work. Screening surveys for cultural resources would include a cultural resources records search to be conducted at the appropriate office member of the California Historical Resources Information System. A field survey will be conducted if determined necessary after the cultural resources records search. Any impacts on identified cultural resources will be avoided to the extent feasible.

   Any initial historic resource screening will identify historic resources on the project site as well as adjacent to the project site.

   It is possible that project work may affect accidentally discovered buried or submerged cultural resources. Any contractor must distribute the Planning Department archaeological resource “ALERT” sheet to any person involved in soil-disturbing activities. If there is any indication of an archaeological or a paleontological resource during the soils disturbing activity of the project, the contractor shall immediately suspend any soils disturbing activities in the area and notify the SFPUC of such discovery. The SFPUC will then work with the Planning Department’s Environmental Review Officer to determine what additional measures should be implemented, based on reports from a qualified archaeological or paleontological consultant.

10. *Project Site*: The SFPUC will conduct construction activities on SFPUC-owned lands to the extent feasible and minimize the need for use of non-SFPUC-owned land during construction. In cases where construction easement or staging areas are needed on non-SFPUC land, the SFPUC will restore these areas to their prior condition so that the owner may return them to their prior use, unless otherwise arranged with the property owner. The site will be maintained to be clean and orderly. Construction staging areas will be sited away from public view where possible. Nighttime lighting will be directed away from residential areas.

    Upon project completion, the construction contractor will return the SFPUC project site to its general condition before construction, including re-grading of the site and re-vegetation of disturbed areas.

6.3 Mitigation Measures to Minimize Facilities Impacts

This section presents all mitigation measures for PSM/SM and PSU/SU impacts described in Chapter 4. Mitigation measures for impacts identified in Sections 4.2 through 4.15 are presented under the respective environmental resource topic, such as Land Use or Biological Resources. Mitigation measures for collective and cumulative impacts (Sections 4.16 and 4.17) are also presented under the appropriate environmental resource topic, rather than under a separate heading, so that similar measures are grouped together. As stated above, all mitigation measures are numbered to correspond to the same impact numbers, although in some cases, the same measure would mitigate more than one impact and the numbering corresponds to the first impact identified and cross-referenced so that measures are not duplicated.

6.3.1 Plans and Policies

None applicable.

6.3.2 Land Use and Visual Resources

Program Measures

Facility Siting Studies

Measure 4.3-2: It is the policy of the SFPUC to construct and operate its facilities on SFPUC-owned lands to the extent feasible. When use of SFPUC-owned land is not feasible, and where additional permanent easement or land acquisition is required, the SFPUC will conduct project-specific facility siting studies and implement these studies' recommendations to avoid or minimize impacts on existing land uses to the maximum extent feasible. Siting studies will identify and evaluate alternative site locations, access roads, building configurations and facility operations to minimize or avoid land use impacts. The studies will also consider existing and planned land uses on and adjacent to proposed facility sites and rights-of-way on non-SFPUC-owned land. To the extent feasible, the SFPUC will implement the recommendations in the siting studies.

Architectural Design

Measure 4.3-4a: The design of permanent new, above-ground facilities will consider the existing visual character of the site and surrounding area, including the visibility of facilities and related structures from scenic highways and scenic roads. Structures will be designed to incorporate building features and design elements that are compatible with the surroundings.

Landscaping Plans

Measure 4.3-4b: The SFPUC will prepare and implement landscaping plans to restore project sites to their pre-construction condition such that short-term construction disturbance does not result in long-term visual impacts. To retain the existing visual character of the site and surrounding area, disturbed areas will be recontoured and revegetated and recontoured to pre-construction condition. Landscape vegetation will include noninvasive, and where possible, native grasses, shrubs, and trees similar to existing landscaping. The SFPUC will monitor landscape plantings annually for five years

after project completion to ensure that sufficient ground coverage has developed and will implement additional measures, such as replanting or modifying irrigation systems, as determined necessary.

Landscape Screens

Measure 4.3-4c: In addition to revegetation of disturbed areas, the landscaping plans will include new plantings and landscape berms to screen views of new structures and equipment from scenic roads to the extent possible, provided that such landscaping does not affect security of SFPUC facilities.

Minimize Tree Removal

Measure 4.3-4d: The SFPUC will minimize or avoid the removal of existing trees that currently screen existing and proposed sites of WSIP facilities by modifying the proposed alignments of new temporary and permanent roads to the extent feasible. The SFPUC will consult with a qualified arborist regarding the minimum buffer zones required to prevent root damage to remaining trees and to provide the SFPUC with any necessary maintenance requirements for remaining trees. Also, the arborist will develop and assist the SFPUC in implementing an appropriate landscaping plan (see Measure 4.3-4b, above), including tree replacement, that is compatible with project operation and maintenance.

Reduce Lighting Effects

Measure 4.3-5: To the extent possible, all permanent exterior lighting will incorporate cutoff shields and non-glare fixture design. All permanent exterior lighting will be directed onsite and downward. In addition, new lighting will be oriented to ensure that no light source is directly visible from neighboring residential areas and will be installed with motion-sensor activation. In addition, highly reflective building materials and/or finishes will not be used in the designs for proposed structures, including fencing and light poles. Vegetation selected for landscaping will be selected, placed and maintained to minimize offsite light and glare in surrounding areas as part of the landscaping plans described in Measure 4.3-4b.

Collective Measures

Construction Coordination at Irvington Portal

Measure 4.16-1a: If construction schedules of multiple WSIP projects occurring at and near Irvington Portal coincide or overlap, the SFPUC will coordinate with construction contractor(s) and neighbors to minimize disturbance of residents in the adjacent neighborhood to the extent practicable. Such coordination will need to balance the duration of construction with the magnitude of construction-related impacts on the same sensitive receptors.

6.3.3 Geology, Soils and Seismicity

Program Measures

Quantified Landslide Analysis

Measure 4.4-1: If the screening analysis conducted in accordance with SFPUC Construction Measure #2 identifies any landslide hazards, affected WSIP facilities will, to the extent feasible, be located away from known landslides, very steep hillsides, debris-flow source areas, the mouths of steep sidehill drainages, and the mouths of canyons that drain steep terrain. However, where these landslide hazard areas cannot be avoided, a more quantified analysis (including a site-specific geologic investigation and a slope stability analysis to determine the potential for landsliding) should be performed as part of the geotechnical investigation. Recommendations identified in the site-specific geotechnical report regarding the potential for landsliding, including appropriate construction measures, will be incorporated into the project designs to minimize the potential for damage to project facilities.

Subsidence Monitoring Program

Measure 4.4-4: As part of the project-specific CEQA review for the New Irvington Tunnel (SV-4) and BDPL Reliability Upgrade (BD-1), the SFPUC will analyze the potential for ground subsidence to occur during tunneling, and will identify project-specific trigger levels that would require corrective action should subsidence occur. As determined to be necessary, the tunnel contractor will implement a subsidence monitoring program during tunneling to detect subsidence, including measurements of groundwater levels, surface and subsurface settlement, ground movement and displacement, and movement in existing infrastructure as needed. The SFPUC will implement corrective actions, such as increased tunnel support, if measured displacement reaches the specified trigger levels.

Characterize Extent of Expansive and Corrosive Soil

Measure 4.4-9: If the screening analysis conducted in accordance with SFPUC Construction Measure #2 identifies a potential for expansive or corrosive soils, the site-specific geotechnical investigation will include a characterization of the presence and extent of expansive and corrosive soil at the project facility site. The results and recommendations of the investigation will be incorporated into the final project design.

6.3.4 Surface Water Hydrology and Water Quality

Program Measures

Site-Specific Groundwater Analysis and Identified Measures

Measure 4.5-2: As part of the project-specific CEQA review for the New Irvington Tunnel project (SV-4), the SFPUC will inventory springs and wells in the area of the planned tunnel and conduct a project-specific analysis of the potential for tunnel dewatering to stop or decrease spring flow, lower groundwater levels in nearby wells, or to otherwise cause adverse effects on groundwater resources and beneficial uses of the groundwater. If a significant impact is identified, then measures such as altering groundwater withdrawal

rates and/or providing an alternate water supply for affected users will be implemented to ensure that groundwater resources or beneficial uses are not adversely affected.

Flood Flow Protection Measures

Measure 4.5-4a: In construction contract specifications, the SFPUC will require the contractor(s) to include, in their erosion control measures or SWPPP prepared for the project, a measure prohibiting the stockpiling of soil, storage of hazardous materials, and stockpiling of construction materials in flood zones, where practical. Where construction would occur in large flood zones, making it impractical to implement this requirement, the erosion control measures or SWPPP will include measures for protecting stockpiled soil, sources of hazardous materials, and stockpiled construction materials from exposure to flood waters.

Site-Specific Flooding Analysis and Identified Measures

Measure 4.5-4b: As part of the project-specific CEQA review for the Alameda Creek Fishery (SV-1) and New Irvington Tunnel (SV-4) projects, the SFPUC will conduct a site-specific analysis of the potential for flooding as a result of project implementation. If a dam or concrete weir is installed in Alameda Creek under the Alameda Creek Fishery project, the analysis will include, at a minimum, the stream flow data and planned design and operation of the dam or weir to prevent flooding impacts. For the New Irvington Tunnel project, the analysis will include design measures needed to ensure that upstream water levels are not affected, bridge abutments are protected from damage due to flood flows and would not adversely redirect flood flows, and that bridge pilings are protected from scour.

Stormwater Treatment and Groundwater Monitoring

Measure 4.5-5: If treated stormwater is used to augment Lake Merced water levels, the project-level CEQA analysis for the Local Groundwater Projects (SF-2) will include measures to ensure that use of stormwater does not promote eutrophication of the lake and provisions for implementing these measures. The project-level CEQA analysis will also evaluate the potential for groundwater quality degradation due to the use of treated stormwater to augment lake levels. If necessary, the SFPUC will implement a groundwater monitoring program in the vicinity of Lake Merced to monitor for degradation of groundwater quality. Monitoring will include water quality sampling for total coliform bacteria, total nitrogen, nitrate, nitrite, total organic carbon, parameters for which drinking water quality criteria have been established, and any other potential pollutants of concern. The project-level CEQA documentation will identify corrective actions that would be implemented should groundwater quality degradation be identified, such as additional treatment of water used to augment water levels in Lake Merced.

Appropriate Source Control and Site Design Measures

Measure 4.5-6: For projects located in areas not covered by a municipal stormwater permit and disturbing less than one acre of land during construction, the SFPUC will implement appropriate source control and site design measures that 1) minimize the stormwater flow rate and quantity to prevent off-site erosion and flooding; and 2) minimize stormwater pollutant discharges to the maximum extent possible. These measures will ensure compliance with applicable water quality criteria and goals and protect the beneficial uses of the receiving water.

6.3.5 Biological Resources

Program Measures

Wetlands Assessment

Measure 4.6-1a: As part of project-specific CEQA review, a qualified wetland scientist will review project plans, airphotos, and topographic maps and conduct a site visit to determine whether wetlands are present and could be affected by the project. If the review shows that wetlands could be affected, the wetland scientist will perform a formal wetland delineation and develop mitigation as per Measure 4.6-1b, below.

Compensation for Wetlands and Other Biological Resources

Measure 4.6-1b: If the wetland delineation indicates that the WSIP project will affect jurisdictional wetlands or aquatic resources, then, in accordance with state and federal permit requirements, the SFPUC will avoid and minimize direct and indirect impacts such as erosion and sedimentation, alteration of hydrology, and degradation of water quality. As a first priority, the SFPUC will implement (1) avoidance measures. For unavoidable impacts, the SFPUC will implement (2) minimization of unavoidable impacts, (3) restoration procedures, and (4) compensatory creation or enhancement to ensure no net loss of wetland extent or function.

In addition to wetlands, the SFPUC will compensate for sensitive riparian and upland habitats and habitats which support key special-status species or other species of concern lost as a result of WSIP project construction and operation. Similar habitat will be identified, protected, restored, enhanced, created and managed off-site[3] to ensure no net loss of habitat extent or function. For each WSIP project, a qualified biologist will quantify the magnitude and extent of impacts to wetlands, sensitive habitats, and key special-status species and other species of concern, and the SFPUC will develop and implement restoration and/or compensation plans that meet the appropriate regulatory requirements and permit conditions with respect to restoration and/or compensation ratios. Compensation ratios typically range from a minimum of 1:1 for common habitats to 2:1 or higher for rare and sensitive habitats. If individual project requirements of the RWQCB, CDFG, or USFWS differ somewhat from these ratios, they are still intended to achieve the same purpose of full restoration and/or compensation, to mitigate project impacts to less-than-significant levels, and to ensure no net reduction in the populations of any species listed as threatened or endangered by the state or federal resource agencies.

The SFPUC will obtain required permits for each project and comply with applicable environmental regulations addressing sensitive habitats and species. Compensatory lands, including those restored or enhanced as well as those acquired or designated as protected as part of program or project mitigation, will be established in perpetuity with a commitment that such lands will not be used for any purpose that conflicts with the primary purpose of maintaining intact wildlife and plant habitat.

[3] Off-site means the compensatory action is located other than within the project construction footprint, but could be on lands already under SFPUC ownership. Measure 4.6-2 addresses compensatory actions to be taken within the construction footprint.

One alternative for implementing off-site habitat compensation is the Habitat Reserve Program (HRP) currently being developed by the SFPUC. The purpose of the HRP is to provide a comprehensive, coordinated approach to mitigation and related regulatory compliance for WSIP projects. This related SFPUC project is described further in Chapter 3.0, Section 3.11. Under the proposed HRP, the SFPUC would proceed as soon as possible with securing (through designation, management agreement, conservation easement, or acquisition of fee title) and improving lands to be used for habitat compensation so that mitigation is underway before or concurrent with habitat loss related to WSIP project activities, further ensuring no net loss of resources. CEQA environmental

review for the proposed HRP will commence in 2007 and is targeted for implementation as soon as possible thereafter. Once the HRP is approved and implemented, the SFPUC will use this as one vehicle or method for implementing the mitigation requirements for individual WSIP projects. Otherwise, where appropriate and necessary, the SFPUC will develop and implement appropriate habitat compensation mitigation for individual WSIP projects.

Habitat Restoration/Tree Replacement

Measure 4.6-2: If the biological screening survey identifies sensitive habitats or heritage trees, the following measures, as modified and applied to WSIP projects, will be implemented:

- Temporarily-impacted sensitive habitats (natural communities identified as sensitive by CDFG, and USFWS-designated critical habitat) would be restored to their pre-project condition.

- If specific trees to be removed are designated as heritage trees (or similar local designation), then SFPUC will replace the trees, consistent with requirements in local ordinances. If such heritage trees occur near extensive areas of sensitive habitats, locally collected, native species will be used as replacement trees where possible.

- Where possible, the loss of sensitive habitats will be minimized by coordinating WSIP projects to make repeated use of staging/construction areas and access roads. For example, tunnel spoils could be considered for borrow material for other projects.

Protection Measures During Construction for Key Special-Status Species and Other Species of Concern

Measure 4.6-3a: The following general practice measures, as modified and applied to the WSIP projects, will be implemented if the initial biological screening survey (SFPUC Construction Measure #8) indicates the potential for the presence of key special-status species and other species of concern:

- Preconstruction surveys for key special-status species and other species of concern will be conducted by a qualified biologist to verify their presence or absence. Surveys will occur during the portion of the species' life cycle when the species is most likely to be identified within the appropriate habitat. Key special-status species and other species of concern will be avoided during construction when possible.

- A worker awareness program (environmental education) will be developed and implemented to inform project workers of their responsibilities in regards to sensitive biological resources.

- An environmental inspector will be appointed to serve as a contact for issues that may arise concerning implementation of mitigation measures, and to document and report on adherence to these measures during construction.

- Loss of habitat will be minimized through the following measures: (1) the number and size of access routes and staging areas and the total area of the project activity

will be limited to the minimum necessary to achieve the project goal; (2) the introduction or spread of invasive non-native plant species and plant pathogens will be avoided or minimized by developing and implementing a weed control plan; and (3) all areas temporarily disturbed by construction will be revegetated to pre-project or native conditions, as specified in project-specific revegetation plans.

Standard Mitigation Measures for Specific Plants and Animals

Measure 4.6-3b: Table 6.1 identifies the key special-status species mitigation measures that the program analysis indicates would apply to each WSIP project. Measures listed in **Table 6.2** (listed by species) are generic measures and will be modified to fit site-specific conditions and applied to each WSIP project wherever special-status species could be affected by the projects. Surveys required under Measure 4.6-3a will refine the list of species that could be affected by a project. Table 6.1 is intended as the minimum necessary actions. In addition to adopting the generic measures, as more site-specific information is available, project-specific CEQA analysis may identify additional measures for key special-status species and additional measures for other species.

Pipeline and Water Treatment Plant Treated Water Discharge Restrictions

Measure 4.6-4: Planned discharges of regional system water from the WSIP pipelines and water treatment plants (such as crossover facilities) to creeks, rivers or other natural water bodies will be designed to minimize impacts to riparian and aquatic resources to the extent feasible. This will include dechlorination and/or pH adjustment facilities and energy dissipation structures that avoid or reduce bank erosion. In addition, the facilities should include design features to avoid or minimize temperature effects on aquatic resources; or alternatively, whenever possible, planned discharges should be scheduled to occur in the winter, when stream flows are high and temperatures low in the receiving waters to avoid or minimize temperature effects.

Collective Measures

Bioregional Habitat Restoration Measures

Measure 4.16-4a: Bioregional effects (those beyond the level of individual plants or animals and impacts not readily associated with any particular project) could result from the collective construction of WSIP facilities and the cumulative effects of implementing WSIP projects along with other proposed projects. Combined collective and cumulative bioregional effects that will need to be addressed as part of future mitigation efforts include the following:

- Compound impacts on functional units of habitat as WSIP projects simplify vegetation structure and increase “edge” (the boundary between two different habitats);
- Increased habitat impacts due to the spread of weedy, non-native plant species;
- Genetic diversity impacts on small populations that become reduced and isolated by development;

TABLE 6.1 (SEE MEASURE 4.6-3b)
MITIGATION MEASURES FOR KEY SPECIAL-STATUS SPECIES

No.	Project Name **Notes:** **1. This table is for guidance only and is not intended as a complete list of mitigations for all projects, which must be assessed individually at the project-specific level.** **2. Standard measure B.4 (general surveys for raptors and protection of raptor nests) apply to all projects.**	Suites of Key Special-Status Species						Individual Special-Status Species								
		Vernal Pool Invertebrates	Vernal Pool Plants	Riparian and Reservoir Species	Native Grassland Species	Salt Marsh Species	Fishes	Large-Flowered Fiddleneck	Foothill yellow-legged frog	California Red-Legged Frog	California Tiger Salamander	San Francisco Garter Snake	Alameda Whipsnake	Swainson's Hawk	Western Burrowing Owl	San Joaquin Kit Fox
SJ-1	Advanced Disinfection	I.2								RA.1	RA.2			B.1	B.2, B.3	M.2
SJ-2	Lawrence Livermore Supply Improvements	I.2						P.3		RA.1	RA.2			B.1	B.2, B.3	M.2
SJ-3	San Joaquin Pipeline System	I.2	P.1	I.1, P.2, B.5, M.3			F.1			RA.1	RA.2			B.1	B.2, B.3	M.2
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	I.2	P.1	I.1, P.2, B.5, M.3			F.1			RA.1	RA.2			B.1	B.2, B.3	M.2
SJ-5	Tesla Portal Disinfection Station	I.2								RA.1	RA.2			B.1	B.2, B.3	M.2
SV-1	Alameda Creek Fishery Enhancement			B.5			F.1		RA.1	RA.1	RA.2		RA.4		B.2, B.3	
SV-2	Calaveras Dam Replacement			B.5	I.3		F.1		RA.1	RA.1	RA.2		RA.4		B.2, B.3	
SV-3	Additional 40-mgd Treated Water Supply			B.5					RA.1	RA.1	RA.2		RA.4		B.2, B.3	
SV-4	New Irvington Tunnel			B.5			F.1		RA.1	RA.1	RA.2		RA.4		B.2, B.3	
SV-5	SVWTP – New Treated Water Reservoirs			B.5			F.1		RA.1	RA.1	RA.2		RA.4		B.2, B.3	
SV-6	San Antonio Backup Pipeline			B.5			F.1		RA.1	RA.1	RA.2		RA.4		B.2, B.3	
BD-1	Bay Division Pipeline Reliability Upgrade	I.2				B.6, B.7, M.1	F.1			RA.1	RA.2		RA.4		B.2, B.3	
BD-2	BDPL Nos. 3 and 4 Crossovers	I.2					F.1			RA.1	RA.2				B.2, B.3	
BD-3	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault									RA.1	RA.2				B.2, B.3	

TABLE 6-1 (SEE MEASURE 4.6-3b) (Continued)
MITIGATION MEASURES FOR KEY SPECIAL-STATUS SPECIES

No.	Project Name Notes: 1. This table is for guidance only and is not intended as a complete list of mitigations for all projects, which must be assessed individually at the project-specific level. 2. Standard measure B.4 (general surveys for raptors and protection of raptor nests) apply to all projects.	Suites of Key Special-Status Species						Individual Special-Status Species								
		Vernal Pool Invertebrates	Vernal Pool Plants	Riparian and Reservoir Species	Native Grassland Species	Salt Marsh Species	Fishes	Large-Flowered Fiddleneck	Foothill yellow-legged frog	California Red-Legged Frog	California Tiger Salamander	San Francisco Garter Snake	Alameda Whipsnake	Swainson's Hawk	Western Burrowing Owl	San Joaquin Kit Fox
PN-1	Baden and San Pedro Valve Lots Improvements									RA.1	RA.2	RA.3				
PN-2	Crystal Springs/San Andreas Transmission Upgrade			B.5						RA.1	RA.2	RA.3				
PN-3	HTWTP Long-Term Improvements															
PN-4	Lower Crystal Springs Dam Improvements			B.5	I.3, P.4		F.1			RA.1	RA.2	RA.3				
PN-5	Pulgas Balancing Reservoir Rehabilitation									RA.1	RA.2	RA.3				
SF-1	San Andreas Pipeline No. 3 Installation															
SF-2	Groundwater Projects				P.4, I.3					RA.1		RA.3				
SF-3	Recycled Water Projects				P.4, I.3					RA.1		RA.3				

Note: Project-specific CEQA documents would review recent special-status species lists relevant to the habitats present.

All codes are defined in Table 6-2.

Vernal pool invertebrates:
- Vernal pool fairy shrimp
- Conservancy fairy shrimp
- Vernal pool tadpole shrimp

Vernal pool species:
- Succulent owl's-clover
- Hoover's spurge
- Colusa grass
- San Joaquin Valley Orcutt grass
- Hairy Orcutt grass
- Greene's tuctoria

Salt marsh species:
- Western snowy plover
- California clapper rail
- California black rail
- Salt marsh harvest mouse

Riparian and Reservoir species:
- Least Bell's vireo
- Valley elderberry longhorn beetle
- Riparian woodrat
- Delta button-celery
- Bald eagle

Fishes:
- Green sturgeon (San Joaquin Valley only)
- Chinook salmon
- Central Valley DPS steelhead
- Central California Coast DPS steelhead
- Rainbow trout (Alameda watershed)

Native grassland species:
- Bay checkerspot butterfly
- Callippe silverspot butterfly
- Fountain thistle (Peninsula)
- Marin dwarf flax (Peninsula)
- San Mateo woolly sunflower (Peninsula)

TABLE 6-2 (MEASURE 4.6-3b)
STANDARD PROGRAMMATIC BIOLOGICAL RESOURCES MITIGATION MEASURES

Biological Resource Species and Status	Standard Mitigation Measures for Specific Plants and Animals
Invertebrates	
Valley Elderberry Longhorn Beetle (FT/--)	**I.1:** A biological monitor will accompany tree/brush clearing crews. The monitor will flag all elderberry shrubs in the tree clearing zone and be present during tree clearing operations in the vicinity of flagged shrubs to ensure that elderberry shrubs are not cut. If avoidance is not feasible, habitat impacts will be mitigated in accordance with the Programmatic Biological Opinion (PBO) for Valley elderberry longhorn beetle, issued by the USFWS Sacramento Field Office in 1996.
Vernal Pool Crustaceans Vernal pool fairy shrimp (FT/--) Conservancy fairy shrimp (FE/--) Vernal pool tadpole shrimp (FE/--)	**I.2:** Suitable habitat for vernal pool invertebrates will be avoided. If infeasible, impacts will be mitigated in accordance with the PBO for vernal pool invertebrates, issued by the USFWS Sacramento Field Office in 1995. Surveys may be conducted, with USFWS approval, to establish whether or not listed invertebrates are present.
Bay Checkerspot Butterfly (FT/--), Callippe Silverspot Butterfly (FE/--)	**I.3:** Suitable habitat for Bay checkerspot and Callippe silverspot butterflies will be avoided
Fishes	
Central Valley fall- and late-fall run DPSChinook salmon (FC/--) Central Valley DPS steelhead (FT/--) Green sturgeon Southern District DPS (FT/--) Central Coast DPS Steelhead (FT/--) Rainbow trout (--/--)	**F1:** For construction activity in anadromous fish-bearing streams, a biological monitor with appropriate permits will be present during all construction activities to relocate fish as necessary.
Reptiles and Amphibians	
California Red-Legged Frog (FT/CSC) Foothill yellow-legged frog (--/CSC)	**RA.1:** A PBO for construction impacts on red-legged frog was prepared by the USFWS (Federal Register, 1999). The general mitigation measures, above, and the measures listed below, are taken largely from the PBO and may be modified by a project-specific BO. The foothill yellow-legged frog has no legal protection under FESA; however, all potential FYLF habitat is also considered potential habitat for CRLF and these protection measures would be applied in any case. • The name and credentials of a biologist qualified to act as a construction monitor will be submitted to the USFWS for approval at least 15 days prior to commencement of work. • The USFWS-approved biologist will survey the site two weeks prior to the onset of work activities and immediately prior to commencing work. If frog adults, tadpoles, or eggs are found, the approved biologist will contact the USFWS to determine whether relocating any life stages is appropriate. • If worksites require dewatering, the intakes will be screened with a maximum mesh size of 5 millimeters. • The USFWS-approved biologist will remove and destroy from within the project area any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible.

TABLE 6-2 (MEASURE 4.6-3b) (Continued)
STANDARD PROGRAMMATIC BIOLOGICAL RESOURCES MITIGATION MEASURES

Biological Resource Species and Status	Standard Mitigation Measures for Specific Plants and Animals
Reptiles and Amphibians (cont.)	
California Tiger Salamander (FT/CSC)	**RA.2:** In addition to measures described for California red-legged frog, which would serve to protect California tiger salamander, the following measures will minimize adverse effects to California tiger salamander. • A preconstruction survey will be conducted at each site to identify suitable burrow aestivation areas. Aestivation habitat will be defined as the presence of two or more small mammal burrows greater than 1 inch in diameter within a 10-foot-diameter area and within 10 feet of proposed construction sites (i.e., the presence of a single isolated gopher hole would not be considered habitat). As feasible within the context of the work area, aestivation areas will be temporarily fenced and avoided. • At locations where aestivation burrows are identified and cannot be avoided, aestivation burrows will be excavated by hand prior to construction and individual animals moved to natural burrows or artificial burrows constructed of PVC pipe within 0.25 mile of the construction site. • To ensure compliance with these measures and minimize California tiger salamander take, a qualified biological monitor will be present during all construction operations at locations with suitable aestivation burrows. Construction sites where potential habitat has been identified will be surveyed by a qualified biologist for California tiger salamander. Surveys would be appropriately timed with respect to salamander activity and proposed construction activities. • Surveys would include drift fences and pitfall traps within construction sites to identify and relocate animals. Following removal of individuals, construction areas will be fenced with temporary silt fencing.
San Francisco Garter Snake (FE/CE/CP)	**RA.3:** San Francisco garter snake is a California fully protected species, and incidental taking must be avoided. Therefore, in addition to measures RA.1 and RA.2, above, for construction activities in occupied habitat the work area will be fenced with frog- and snake-proof mesh fence, or 4- x 8-foot plywood panels joined lengthwise, with escape funnels to allow egress, but not access, by San Francisco garter snake.
Alameda Whipsnake (FT/CT)	**RA.4:** Construction-related impacts on individual Alameda whipsnakes will be minimized and/or avoided through the development and implementation of an Alameda whipsnake protection and monitoring plan, to be approved by the USFWS during informal consultation under FESA. Protective measures outlined in RA.1 will apply to all areas of known or potential habitat for Alameda whipsnake. In addition, it will include: • Sites within Alameda whipsnake habitat will be hand-cleared, or a qualified biologist will do surveys and relocate the snake immediately prior to equipment clearing. • Activities that could harm or harass Alameda whipsnake will be avoided or minimized. • Upland habitats used by Alameda whipsnake will be restored as feasible, and lost habitat will be compensated according to an agreed-upon ratio.
Birds	
Swainson's Hawk (FSC/CT)	**B.1:** To avoid disrupting nesting Swainson's hawks, construction activities at known nesting locations will occur prior to the nesting season (March 1 through September 15). Alternatively, if construction activities take place during the nesting season, a qualified biologist will conduct a preconstruction survey no more than two weeks before the start of construction and report whether or not there are nesting Swainson's hawks within 1,320 feet of any project (access permitting). If there are nesting Swainson's hawks within the 1,320-foot buffer areas, construction will be delayed until the CDFG has been consulted to determine suitable avoidance measures. A potential avoidance measure may include delaying all construction activity within 1,320 feet of an active Swainson's hawk nest until the adult and/or juvenile hawks are no longer using the nest as the center of their activity.

TABLE 6-2 (MEASURE 4.6-3b) (Continued)
STANDARD PROGRAMMATIC BIOLOGICAL RESOURCES MITIGATION MEASURES

Biological Resource Species and Status	Standard Mitigation Measures for Specific Plants and Animals
Birds (cont.)	
Western Burrowing Owl (FSC/CSC)	**B.2:** No more than two weeks before construction, a survey for burrows and burrowing owls will be conducted by a qualified biologist within 500 feet of the project (access permitting). The survey will conform to the protocol described by the California Burrowing Owl Consortium (1995), which includes up to four surveys on different dates if there are suitable burrows present. **B.3:** If occupied owl burrows are found within the survey area, a determination will be made by a qualified biologist, in consultation with the CDFG, as to whether or not work will affect the occupied burrows or disrupt reproductive behavior. If it is determined that construction will not affect occupied burrows or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures. If it is determined that construction will affect occupied burrows during August through February, the subject owls will be passively relocated from the occupied burrow(s) using one-way doors. There will be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow before one-way doors are installed. Artificial burrows will be in place at least one-week before one-way doors are installed on occupied burrows. One-way doors will be in place for a minimum of 48 hours before burrows are excavated. If it is determined that construction will physically affect occupied burrows or disrupt reproductive behavior during the nesting season (March through July), then avoidance is the only mitigation available. Construction will be delayed within 300 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer using the natal burrow as their primary source of shelter.
Raptors including bald eagle (FD/CE/CFP)	**B.4: Raptor nests:** • In consultation with CDFG and USFWS trees with unoccupied raptor nests (stick nests or cavities) may only be removed prior to March 1, or following the nesting season. • A survey to identify active nests will be conducted by a qualified biologist no more than two weeks before the start of construction at project sites from February 1 through July 30. • Construction activities within 0.5 mile of an active bald eagle nest may not occur between February 1 and July 31. • Active raptor nests located within 500 feet of the project will be mapped, to the extent allowed by access. • If an active raptor nest is found within 500 feet of the project, a determination will be made by a qualified biologist, in consultation with the CDFG, as to whether or not construction work will affect the active nest or disrupt reproductive behavior. • If it is determined that construction will not affect an active nest or disrupt breeding behavior, construction will proceed without any restriction or mitigation measure. • If it is determined that construction will affect an active raptor nest or disrupt reproductive behavior, then avoidance is the only mitigation available. Construction will be delayed within 300 feet of such a nest until a qualified biologist determines that the subject raptors are not nesting or until any juvenile raptors are no longer using the nest as their primary day and night roost.
Least Bell's vireo (FE/CE)	**B.5:** Protection for least Bell's vireos depend principally on seasonal avoidance of habitat during the nesting season and protection of suitable habitat. To avoid working during the active breeding season, construction activities in suitable habitat (dense willows [*Salix* sp.], mulefat [*Baccharis glutinosa*], or California wild rose [*Rosa californica*] may not proceed until July 15 unless approved by the USFWS and CDFG, as appropriate.
California Black Rail (FE/CE), California Clapper Rail (FSC/CT/CFP)	**B.6:** When working within 100 feet of salt or brackish marshland (e.g., the BDPL Reliability Upgrade, BD-1), presume presence for either species during the period from February 1 to August 31, and schedule construction to begin no earlier than September 1 and end no later than January 31.

TABLE 6-2 (MEASURE 4.6-3b) (Continued)
STANDARD PROGRAMMATIC BIOLOGICAL RESOURCES MITIGATION MEASURES

Biological Resource Species and Status	Standard Mitigation Measures for Specific Plants and Animals
Birds (cont.)	
Western Snowy Plover (FT/CSC)	**B.7:** When project activities are in or adjacent to suitable habitat (e.g., portions of the BDPL Reliability Upgrade, BD-1) no earlier than September 1 and no later than January 31, no measures are necessary; however, between March 15 and August 31 the following will be observed: • A qualified biologist will conduct preconstruction surveys two weeks and one week before the start of work. If western snowy plovers or their nests are not observed, then the project activity may proceed; or • If a western snowy plover is observed within a 50-foot perimeter of the location of the construction activity two weeks or one week before, a qualified biologist will observe the activities of the bird(s) to determine if nesting behavior is exhibited. If either nesting behavior or a nest is observed within a 50-foot perimeter of the location of the activity, then the activity will be delayed until either nesting is abandoned or completed.
Mammals	
Salt Marsh Harvest Mouse (FE/CE/CFP)	**M.1:** When project activities are in or adjacent to suitable habitat (e.g., portions of the BDPL Reliability Upgrade, BD-1), vehicles will be confined to existing roads where possible, and disturbed areas will be revegetated with brackish marsh species. Crews will use matting, pontoon boards, or other comparable methods whenever feasible to minimize impacts on vegetation. The placement of mats will be verified by a qualified biologist before their placement to minimize habitat impacts. Crews will work exclusively from mat boards and boardwalks to minimize the trampling of vegetation. A qualified biologist will be available during the course of the maintenance work. In situations where habitat is to be permanently disturbed, project-specific take avoidance measures (such as fencing and trapping to exclude salt marsh harvest mouse) will be developed, since the mouse is a California fully protected species, and incidental taking must be avoided.
San Joaquin Kit Fox (FE/CT)	**M.2:** The following reasonable and prudent measures will be followed to avoid direct or indirect project-related disturbances and impacts on San Joaquin kit fox. Prior to the commencement of construction activities, a qualified biologist will survey for potential kit fox dens within the area to be disturbed and will photograph, mark, and map the dens. Disturbance of all known San Joaquin kit fox dens will be avoided. Limited destruction of potential dens may be allowed, provided the following procedures are implemented: • Potential dens occurring within the construction area will be monitored for three days with tracking medium or an infrared beam camera to determine current usage. If no kit fox activity is observed during this period, the den would be destroyed immediately to preclude subsequent use. If kit fox activity is observed, the den will be considered a known den. • Project-related vehicles will observe a 20-mph speed limit in habitat areas except as posted on county roads and state and federal highways. Off-road traffic outside the designated project area will be prohibited. • To prevent accidental entrapment of kit fox or other animals during construction, all excavated or deep-walled holes or trenches greater than 2 feet will be covered at the end of each workday by plywood or similar materials, or provided with escape routes constructed of earth fill or wooden planks. Before such holes are filled they will be thoroughly inspected for trapped animals. • Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at construction sites for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way.

TABLE 6-2 (MEASURE 4.6-3b) (Continued)
STANDARD PROGRAMMATIC BIOLOGICAL RESOURCES MITIGATION MEASURES

Biological Resource Species and Status	Standard Mitigation Measures for Specific Plants and Animals
Mammals (cont.)	
Riparian Woodrat (FE/CSC)	**M.3:** If construction will involve surface disturbance or vegetation removal in riparian habitat in the San Joaquin Region, a biologist will carry out a preconstruction survey to determine the presence or any signs of riparian woodrat, such as stick nests. Such areas will be avoided if feasible. If avoidance is not feasible, a protection and monitoring plan will be developed and approved by the USFWS during formal consultation under FESA.
Plants	
Vernal Pool Plants Succulent Owl's-Clover ((FE/CE) Hoover's Spurge (FT/--) Colusa Grass (FT/CE) San Joaquin Valley Orcutt grass (FT/CE) Greene's Tuctoria (FE/CR) Hairy Orcutt Grass (FE/CE)	**P.1:** The avoidance measures for vernal pool crustaceans will also apply to vernal pool special-status plants. Surveys to ascertain presence are highly recommended, and if first-year surveys occur during unusually low rainfall conditions, a second year of surveys, if possible, will help to establish whether avoidance measures are needed.
Riparian Plants Delta button-celery (FSC/CE)	**P.2:** The state endangered Delta button-celery occurs on clay soils on the sparsely vegetated margins of seasonally flooded floodplains and swales. Periodic flooding maintains the species' habitat through sustenance of seasonal wetlands and reduction of competition due to scouring. If a population of this species is located in an area proposed for construction, the preferred action is to avoid it if possible. The CDFG might allow salvage and restoration of the site, since this is a species that depends on ongoing disturbance to maintain its habitat. However, such strategies generally involve several years of treatment and post-treatment monitoring, so the simplest approach is to avoid impacts if possible.
Large-Flowered Fiddleneck (FE/CE)	**P.3:** Surveys for large-flowered fiddleneck will be carried out at an appropriate time of year for projects located within the known range of the species (Corral Hollow and hills immediately to the west). Any populations found will be avoided. An approved biological monitor will be present during all surface clearing activities.
San Mateo Woolly Sunflower (FE/CE), Marin Western Flax (FT/CT) Fountain thistle (FE/CE)	**P.4:** Surveys for San Mateo woolly sunflower, fountain thistle and Marin western flax will be carried out at an appropriate time of year for projects located within the known range of the species. Any populations found will be avoided. An approved biological monitor will be present during all construction activities. A plan will be developed to protect populations located along Crystal Springs and Polhemus Roads where project-related construction vehicle traffic will occur. Where populations cannot be avoided, salvage of plants or seed will be implemented, along with a program to compensate for losses.

Status Codes: FE-Federal Endangered; FT-Federal Threatened; FC-Federal Candidate; FSC-Federal Species of Concern. FD-Federal Delisted; CE-California Endangered; CT-California Threatened; CR-California Rare; CFP-California Fully Protected

- Impacts on wildlife movement due to habitat fragmentation;
- Suppression of natural disturbance regimes (e.g., fire, flood) as projects are constructed, operated, and maintained; and
- Reduced population recovery opportunities from stochastic events (e.g., random events such as disease).

When implementing habitat compensation mitigation required for individual WSIP facility projects, the SFPUC shall do so in a manner that addresses the above bioregional effects and includes the following conservation principles:

- The parcels are either contiguous with other areas of relatively undisturbed habitat or are themselves large enough to support most of the species associated with the habitat;
- The distribution of mitigation lands will allow movement of plants and animals between them or from them to habitats otherwise conserved (e.g. as described in The Wilderness Society, 2001); and
- Implementation of habitat compensation mitigation for individual WSIP facility projects will be combined and implemented through a coordinated program with other mitigation efforts, such as through the Habitat Reserve Program (HRP), and shall meet these standards:
    - Long-term management of these lands stipulates maintaining natural disturbance regimes (e.g., through prescribed burning);
    - Long-term control actions for non-native species are applied; and
    - Contingencies are considered which address sharing biological materials and information with other conservation land stewards.[4] This might include restoring suitable sites with plants brought from another protected area once a weed infestation has been brought under control, or animal relocation if done strictly for the purpose of genetic diversity or recovery, and with the approval of the regulatory agencies.

Coordination of Construction Staging and Access

Measure 4.16-4b: When construction schedules for WSIP projects affecting the same areas overlap, the SFPUC will coordinate construction contractor(s) to the extent practicable to minimize surface disturbance associated with access roads, laydown areas, and staging areas.

[4] For example, the California Department of Parks and Recreation (CDPR), East Bay Regional Parks District (EBRPD), and the Midpeninsula Regional Open Space District (MROSD).

6.3.6 Cultural Resources

Program Measures

Suspend Construction Work if Paleontological Resource is Identified

Measure 4.7-1: This mitigation measure builds on SFPUC Construction Measure # 9 for cultural resources, which requires that construction work will be suspended immediately if there is any indication of a paleontological resource. When a paleontological resource (fossilized invertebrate, vertebrate, plant or micro-fossil) is discovered at any of the project sites, an appointed representative of the SFPUC will notify a qualified paleontologist, who will document the discovery as needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in Section 15064.5 of the CEQA Guidelines. When a fossil is found during construction, excavations within 50 feet of the find will be temporarily halted or diverted until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards (SVP 1995, 1996). The paleontologist will notify the SFPUC to determine procedures to be followed before construction is allowed to resume at the location of the find. If the SFPUC determines that avoidance is not feasible, the paleontologist will prepare an excavation plan for mitigating the effects of the project.

Archaeological Testing, Monitoring, and Treatment of Human Remains

Measure 4.7-2a: SPFUC Construction Measure #9 for cultural resources requires that a pre-construction screening be conducted by a qualified archaeologist. Based on the results of this screening, the Environmental Review Officer (ERO) shall determine if implementation of an archaeological testing or archaeological monitoring program or both is the appropriate strategy for avoidance of potential adverse effects to significant archaeological resource. For those projects that require a federal permit and compliance with the NHPA, Section 106, the ERO will review the SHPO-approved requirements in the permit conditions and consider protective approaches that limit undue duplication of efforts.

Archaeological Testing Program. The archaeological consultant shall prepare and submit to the ERO for review and approval an archaeological testing plan (ATP). The archaeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archaeological resource(s) that potentially could be adversely affected by the proposed project, the testing method to be used, and the locations recommended for testing. The purpose of the archaeological testing program will be to determine to the extent possible the presence or absence of any expected archaeological resources and to identify and to preliminarily evaluate the integrity and significance of the resource.

At the completion of the archaeological testing program, the archaeological consultant shall submit a written report of the findings to the ERO. If based on the archaeological testing program the archaeological consultant finds that significant archaeological resources may be present, the ERO in consultation with the archaeological consultant shall determine if additional measures are warranted. Additional measures that may be undertaken include additional archaeological testing, archaeological monitoring, preparation of an archaeological research design and treatment plan, or an archaeological data recovery program.

Archaeological Monitoring Program. The archaeological consultant shall prepare and submit to the ERO for review and approval an archaeological monitoring plan (AMP). The archaeological monitoring program shall be conducted in accordance with the approved AMP. The AMP shall specify what project activities in areas sensitive for buried resources shall be archaeologically monitored. Project activities that may require monitoring may include the installation of pipelines and crossover facilities and certain soils-altering activities such as grading and access road construction associated with construction or improvement of water storage facilities. The archaeological monitoring program shall include the following:

- All project contractors shall be advised to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archaeological resource;

- The archaeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archaeological consultant and the ERO until the ERO has, in consultation with project archaeological consultant, determined that project construction activities are unlikely to have effects on significant archaeological deposits;

- The archaeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis;

- If an intact archaeological deposit is encountered, all soils-disturbing activities within the area specified in the AMP of the deposit shall cease. The archaeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction activities and equipment until the deposit is evaluated. The archaeological consultant shall immediately notify the ERO of the encountered archaeological deposit. The archaeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, and present the findings of this assessment to the ERO.

Whether or not significant archaeological resources are encountered, the archaeological consultant shall submit a written report of the findings of the monitoring program to the ERO.

Additional Requirements: the following requirements, as applicable, are requisite in implementation of either an archaeological testing or monitoring program.

Archaeological Data Recovery Program. The archaeological data recovery program shall be conducted in accord with an archaeological data recovery plan (ADRP). The archaeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archaeological consultant shall submit a draft ADRP to the ERO. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archaeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could

be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations.
- *Cataloguing and Laboratory Analysis*. Description of selected cataloguing system and artifact analysis procedures.
- *Discard and Deaccession Policy*. Description of and rationale for field and post-field discard and deaccession policies.
- *Interpretive Program*. Consideration of an on-site/off-site public interpretive program during the course of the archaeological data recovery program.
- *Security Measures*. Recommended security measures to protect the archaeological resource from vandalism, looting, and non-intentionally damaging activities.
- *Final Report*. Description of proposed report format and distribution of results.
- *Curation*. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains and Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State laws. This shall include immediate notification of the coroner of the county within which the project is located and in the event of the coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archaeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines. Sec. 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. State law allows 24 hours to reach agreement on these matters. If the MLDs do not agree on the reburial method, the Project will follow Section 5097.98(b) of the California Public resources code which states, "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance."

Final Archaeological Resources Report. The archaeological consultant shall submit a Draft Final Archaeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archaeological resource and describes the archaeological and historical research methods employed in the archaeological testing/monitoring/data

recovery program(s) undertaken. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report. Once approved by the ERO, copies of the FARR shall be distributed as follows: the relevant California Historical Resources Information System Information Center shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the Information Center. The Major Environmental Analysis division of the Planning Department (MEA) shall receive three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for evaluation under National Register of Historic Places/California Register of Historical Resources criteria. The SFPUC shall receive copies of the FARR as requested in number. In instances of high public interest in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above.

Accidental Discovery Measures

Measure 4.7-2b: SFPUC Construction Measure # 9 for cultural resources requires that construction activities be suspended immediately if there is any indication of an archaeological resource.

To avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in CEQA Guidelines Section 15064.5(a)(c), the project sponsor shall distribute the Planning Department archaeological resource “ALERT” sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soil disturbing activities within the project site. Prior to any soil disturbing activities being undertaken, each contractor is responsible for ensuring that the “ALERT” sheet is circulated to all field personnel including, machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the “ALERT” sheet.

If the ERO determines that an archaeological resource may be present within the project site, the project sponsor shall retain the services of a qualified archaeological consultant. The archaeological consultant shall advise the ERO as to whether the discovery is an archaeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archaeological resource is present, the archaeological consultant shall identify and evaluate the archaeological resource. The archaeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include: preservation in situ of the archaeological resource; an archaeological monitoring program; or an archaeological testing program. If an archaeological monitoring program or archaeological testing program is required, it shall be consistent with the MEA guidelines for such programs. The ERO may also require that the project sponsor immediately implement a site security program if the archaeological resource is at risk from vandalism, looting, or other damaging actions.

The project archaeological consultant shall submit a Final Archaeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archaeological resource and describing the archaeological and historical research methods employed in the archaeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archaeological resource shall be provided in a separate removable insert within the final report. Once approved by the ERO, copies of the FARR shall be distributed as follows: the relevant California Historical Resources Information System Information Center shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the Information Center. The MEA shall receive three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. The SFPUC shall receive copies of the FARR as requested in number. In instances of high public interest in or the high interpretive value of the resource, the ERO may require a different final report content, format, and distribution than that presented above.

Protection of Historic Districts

Measure 4.7-3: The city's water system facilities affected by WSIP facility projects will be assessed by a qualified historian for their potential contribution to an historic district, following the guidelines identified under Impact 4.7-3. To qualify as an historic district, each resource within that potential district would need to be reliant upon the other resources within the district to be historically significant. Impacts on one resource within the potential district may or may not affect the others, and this conclusion would determine the ultimate significance of the impact.

If an historic district would be affected by one or more proposed WSIP facility projects, the SFPUC, in consultation with the ERO, will develop mitigation measures for effects with attention to the potential district as a whole, with utmost effort made to maintain the district's function, appearance, cohesive site organization, and ability to convey historic significance. Appropriate measures may also include but not be limited to: refinement of facility sites to minimize effects on district appearance and site organization as well as visual screening efforts to reduce the impact of adding new facilities or otherwise modifying the landscape.

Should an historic district be identified at the project level, it should be recorded as such, using the four National/California Register criteria of significance to explain its historical importance as a cohesive group of resources. The district should be documented by completing the State of California Department of Parks and Recreation 523 forms, using a 523D (District) form as an umbrella record to unify the 523A (Primary Record) and 523B (Building, Structure, Object) forms completed for each individual resource within the potential district, and submitting them to SHPO.

Alternatives Identification and Resource Relocation

Measure 4.7-4a: If a project proposes to demolish or remove a historical resource, including individual historic resources and/or historic districts, the SFPUC will attempt to identify feasible project alternatives that eliminate or reduce the need for demolition or removal to the greatest extent possible. The SFPUC will pursue and implement these project alternatives to the extent feasible, consistent with the goals and objectives of the WSIP.

Relocation of a resource will always be preferable to demolition, although relocation might not mitigate impacts to a less-than-significant level. If preservation of the affected historical resource at the current site is determined to be infeasible, the structure shall, if feasible, be stabilized and relocated to other nearby sites appropriate to their historic setting and general environment. This may not be possible in some cases, like in the replacement of Calaveras Dam (if it were identified as a historical resource for the purposes of CEQA). After relocation, the resource shall be treated according to preservation, rehabilitation, or restoration standards, as appropriate, that follow the Secretary of the Interior's *Standards*. This will ensure that the building, structure, object, site, or district retains historic integrity and its historic significance (Measure 4.7-4c). If the affected historical resource can neither be preserved at its current site nor moved to an alternative site and is to be demolished, the SFPUC shall consult with local historical societies and governmental agencies regarding salvage of materials from the affected historical resource for public information or reuse in other locations. Demolition may proceed only after any significant historic features or materials have been identified, preserved (as feasible), and their removal completed.

Representative features such as aqueduct/pipe sections, valves subject to replacement, decorative elements, or plaques/inscriptions from buildings or other portions of structures demolished as a part of the WSIP projects could be preserved and displayed. Most of these types of structures are of sufficient size that they would form "monumental" commemorative structures. For example, an original pipeline valve replaced by modern equipment might be mounted and displayed on publicly accessible SFPUC property with informative placards. Such displays, if located in other jurisdictions, might be subject to those jurisdiction's requirements related to public art, safety, and liability considerations.

Historical Resources Documentation

Measure 4.7-4b: Documentation of a historical resource, including resources identified as contributors to a historic district or as individually significant, prior to demolition or removal is a standard mitigation measure. Such documentation is often tied to meeting the documentation standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER). The publication *Recording Historic Structures: Historic American Buildings Survey/Historic American Engineering Record* (Burns, 1989) provides four levels of documentation corresponding to the level of importance of the historic resource to be documented. For the purpose of this PEIR, the standards for photography in Documentation Levels III and IV have been modified to allow for the use of digital photographs instead of large-format negatives.

Documentation Level I:

1. Drawings: a full set of measured drawings depicting existing or historic conditions.
2. Photographs: photographs with large-format negatives of exterior and interior views; photocopies with large-format negatives of select existing drawings or historic views where available. Photographs would follow the HABS/HAER Photographic Specifications.
3. Written data: history and description.

Documentation Level II:

1. Drawings: select existing drawings, where available, should be photographed with large-format negatives or photographically reproduced on Mylar.

2. Photographs: photographs with large-format negatives of exterior and interior views, or historic views, where available. Photographs would follow the HABS/HAER Photographic Specifications.
3. Written data: history and description.

Documentation Level III:

1. Drawings: sketch plan.

2. Photographs: digital photographs of exterior and interior views.
3. Written data: architectural data form.

Documentation Level IV:

1. Drawings: sketch plan.
2. Photographs: digital photographs of exterior and interior views.
3. HABS/HAER inventory cards.

Digital photography will follow the standards in the National Register of Historic Places and National Historic Landmarks Survey, Photo Policy Expansion, March 2005 (Table VV). Digital image files would be burned to archival-quality disks, such as the eFilm Archival Gold CD-R or DVD-R; or MAM-A Mitsui Gold Archive CD-R or DVD-R.

The SFPUC will prepare, or retain a consultant to prepare, documentation of historical resources prior to any construction work associated with demolition or removal. The appropriate level of documentation will be selected by a qualified professional who meets the standards for history, architectural history, and/or architecture (as appropriate) set forth by the Secretary of the Interior (*Secretary of the Interior's Professional Qualification Standards*, 36 CFR 61) in consultation with a preservation specialist assigned by the San Francisco Planning Department and the local jurisdiction if deemed appropriate by the Planning Department. In addition to the four levels of documentation listed above, salvage and/or interpretive display may also be required if determined appropriate. The professional in history, architectural history and/or architecture (as appropriate) will prepare the documentation and submit it for review and approval by the Planning Department's preservation specialist. One set of the documentation will be archived at each of the following repositories: San Francisco Planning Department, SFPUC, the History Room of the San Francisco Public Library and the Water Resources Center Archive at the University of California Berkeley. Additional dissemination of documentation to local historical societies or historic preservation organizations may be appropriate. The San Francisco Planning Department will identify additional appropriate recipients of historical documentation during the project-level analysis.

Secretary of the Interior's Standards for Treatment of Historic Properties

Measure 4.7-4c: Compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* would reduce potential impacts associated with the alteration or modification of a historical resource (including historic districts and individually eligible resources) to a less-than-significant level. (In accordance with CEQA Section 15064.5(b)(3), a project that follows the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* or the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* is generally considered to have impacts of a less-than-significant level.)

The SFPUC will prepare materials describing and depicting the proposed project, including but not limited to plans, drawings, and photographs of existing conditions (digital, following the standards in Measure 4.7-4a as well as proposed project plans, drawings, specifications, and description). Prepared materials will be submitted to the San Francisco

Planning Department. The Planning Department will review the proposed project, for compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

If a project is determined to be inconsistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, the SFPUC will pursue and implement redesign of the project to the extent feasible, consistent with the goals and objectives of the WSIP, such that consistency with the standards is achieved.

Historic Resources Survey and Redesign

Measure 4.7-4d: The SFPUC will undertake a historic resources survey within a designated area of potential effect that encompasses the proposed project to identify and evaluate potential historical resources, including districts, which may exist within or partially within the project's study area or area of potential effect. The survey will be conducted by a qualified professional who meets the *Secretary of the Interior's Professional Qualification Standards* for architectural history, history, or architecture (36 CFR 61).

If a survey identifies one or more historical resources in the projects' study area, or area of potential effect (i.e. historically significant resources), the qualified professional will then assess the impact the project may have on those historical resources. If the project will cause a substantial adverse change to a historical resource, the SFPUC will prepare materials describing and depicting the proposed project, including but not limited to plans, drawings, and photographs of existing conditions (digital, following the standards in Measure 4.7-1a) as well proposed project plans, drawings, specifications, and description. Prepared materials will be submitted to the San Francisco Planning Department. The San Francisco Planning Department will assign a preservation specialist to review the proposed project, for compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

If a project is determined to be inconsistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, the SFPUC will pursue and implement redesign of the project to the extent feasible, consistent with the goals and objectives of the WSIP, such that consistency with the standards is achieved.

Historic Resources Protection Plan

Measure 4.7-4e: A qualified historian will prepare a plan that specifies procedures for protecting historical resources and a monitoring method to be employed by the contractor while working near these resources. At a minimum, the plan will address the operation of construction equipment near adjacent historical resources, storage of construction materials away from adjacent resources, and education/training of construction workers about the significance of the historical resources.

Preconstruction Surveys and Vibration Monitoring

Measure 4.7-4f: If vibration-related impacts could impact historical resources, one or more geotechnical investigations by a California-licensed geotechnical engineer will be included as part of the proposed project. The SFPUC and its contractors will follow the recommendations of the final geotechnical reports regarding any excavation and

construction for the project. The SFPUC will ensure that the construction contractor conducts a preconstruction survey of existing conditions and monitors the adjacent buildings for damage during construction, if recommended by the geotechnical engineer. Any preconstruction surveys and construction monitoring would include the services of a professional meeting the *Secretary of the Interior's Professional Qualification Standards* for architecture.

6.3.7 Traffic, Transportation, and Circulation

Program Measures

Traffic Control Plan Measures

Measure 4.8-1a: SFPUC Construction Measure #5 for traffic requires each contractor to prepare a traffic control plan to minimize traffic and on-street parking impacts on any streets affected by construction of the proposed program. SFPUC and construction contactor(s) will prepare and implement a traffic control plan, and coordinate with Caltrans and local jurisdictions, as appropriate, for affected roadways and intersections. Each project may require the implementation of different measures, depending on the project's site-specific construction details, the characteristics of the transportation network, and daily and peak hour vehicle, pedestrian and bicycle volumes. As applicable, elements of the traffic control plan could include, but are not necessarily limited to, the following:

- Circulation and detour plans will be developed to minimize impacts on local street circulation. Flaggers and/or signage will be used to guide vehicles through and/or around the construction zone.
- Truck routes designated by cities and counties will be identified in the traffic control plan. Haul routes that minimize truck traffic on local roadways and residential streets will be utilized to the extent possible.
- Sufficient staging areas will be provided for trucks accessing construction zones to minimize disruption of access to adjacent land uses, particularly at entries to onsite pipeline construction within residential neighborhoods.
- Access to driveways and private roads will be maintained by using steel trench plates. If access must be restricted for brief periods, property owners will be notified in advance.
- Construction vehicle movement will be controlled and monitored through the enforcement of standard construction specifications by onsite inspectors.
- Along major arterials, truck trips will be scheduled outside of the peak morning and evening commute hours to the extent possible.
- Lane closures will be limited during peak hours to the extent possible. Outside of allowed working hours or when work is not in progress, roads will be restored to normal operations, with all trenches covered with steel plates.

- Where possible, pipeline construction work in roadways will be limited to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone. Parking may be prohibited if necessary to facilitate construction activities or traffic movement. If the work zone width will not allow a 10-foot-wide paved travel lane, then the road will be closed to through-traffic (except emergency vehicles), and detour signing on alternative access roads will be used.

- Pedestrian and bicycle access and circulation will be maintained during project construction where safe to do so. If construction activities encroach on a bicycle lane, warning signs will be posted that indicate bicycles and vehicles are sharing the lane.

- Detours will be included for bicycles and pedestrians in all areas potentially affected by project construction.

- All equipment and materials will be stored in designated contractor staging areas on or adjacent to the worksite, in such a manner to minimize obstruction of traffic.

- Locations will be identified for parking by construction workers, either within the construction zone or, if necessary, at a nearby location with transport provided between the parking location and the worksite.

- Roadside safety protocols will be implemented. Advance "Road Work Ahead" warning signs and speed control (including signs informing drivers of state-legislated double fines for speed infractions in a construction zone) will be provided to achieve required speed reductions for safe traffic flow through the work zone.

- Construction will be coordinated with facility owners or administrators of sensitive land uses such as police and fire stations (including all fire protection agencies), transit stations, hospitals, and schools. Facility owners or operators will be notified in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures.

- Construction will be coordinated with local transit service providers, including temporary relocation of bus routes or bus stops in work zones as necessary.

- Roadway right-of-ways will be repaired or restored to their original conditions or better upon completion of construction.

- To the extent applicable, the traffic control plan will conform to the *California Manual on Uniform Traffic Control Devices for Streets and Highways: Part 6 Temporary Traffic Control* and *Caltrans' 2006 Standard Plans*.

Coordination of Individual Traffic Control Plans

Measure 4.8-1b: To the extent that the adopted SFPUC Construction Measure #5 does not contain such provisions already, or the provisions are not required for a project as a result of local encroachment or right-of-way permit conditions, the contract specifications for individual contracts within a single WSIP project will include the following:

- In the event that more than one construction contract is issued for work along existing or new pipelines, and where construction could occur within and/or across

multiple streets in the same vicinity, the SFPUC and construction contractor(s) will coordinate the traffic control plans in order to mitigate the impact of traffic disruption. The coordinated plan will include measures that address overlapping construction schedules and activities, truck arrivals and departures, lane closures and detours, and the adequacy of on-street staging requirements.

Accommodation of Displaced Public Parking Supply for Recreational Visitors

Measure 4.8-4: Due to the potential displacement of designated parking areas where limited parking is available for adjacent public uses, traffic control plans prepared as part of SFPUC Construction Measure #5 and Measure 4.8-1a will include an additional measure to accommodate any anticipated visitor parking demand that would be displaced by proposed projects at public recreational facilities.

Collective Measures

SFPUC WSIP Projects Construction Coordinator

Measure 4.16-6a: Due to the potential for overlapping project activities and construction vehicles to affect travel within and across the five regions, the SFPUC will identify a qualified construction coordinator responsible for coordinating the project-specific traffic control plans developed as part of Measure 4.8-1a, and for developing a public information campaign (e.g., internet website, radio and newspaper updates) to inform the public of construction activities, detour routes, and alternate routes. Throughout the seven-year construction schedule for the WSIP projects, the SFPUC construction coordinator will work with local and regional agencies to pursue additional traffic mitigation measures to minimize local and regional traffic impacts and will incorporate these measures into the project-specific traffic control plans, as appropriate.

Combined San Joaquin Traffic Control Plan

Measure 4.16-6b: Due to the potential for overlapping project schedules in the San Joaquin Region near Tesla Portal, the SFPUC will develop [or the SFPUC's construction contractor(s) will be required to develop] a San Joaquin Traffic Control Plan that coordinates the project-specific traffic control plans developed as part of Measure 4.8-1a and identifies additional measures to minimize the combined impacts of multiple WSIP project construction traffic on I-580, Chrisman Road, and Vernalis Road. As applicable, these measures will be developed consistent with the standards of San Joaquin County, Stanislaus County, and Caltrans and could include:

- Additional traffic control devices, such as traffic signals at key intersections providing access to local roadways and land uses
- Additional traffic control personnel at key locations to facilitate vehicular traffic flow during peak periods of truck activity
- Adjustments in truck arrival and departure schedules for the various facilities (e.g., staggering departures)

Combined Sunol Valley Traffic Control Plan

Measure 4.16-6c: Due to the potential for overlapping project schedules in the Sunol Valley Region as well as for construction traffic to use Calaveras Road as an access route to all projects sites, the SFPUC or its construction contractor(s) will develop a Sunol Valley Traffic Control Plan that coordinates the project-specific traffic control plans developed as part of Measure 4.8-1a and identifies additional measures to minimize the impacts of construction traffic on Calaveras Road and I-680. As applicable, these measures will be developed consistent with the standards of Alameda County and Caltrans and could include:

- Additional traffic control devices, such as traffic signals at key intersections providing access to local roadways and land uses. Traffic signals could facilitate access onto Calaveras Road at intersections and also allow for gaps in truck traffic flow to facilitate access from driveways along Calaveras Road.
- Additional traffic control personnel at key locations to facilitate vehicular traffic flow during peak periods of truck activity.
- Adjustments in truck arrival and departure schedules for the various facilities (e.g., staggering departures).
- Public information regarding periods when construction traffic on Calaveras Road would be greatest.
- Working with Caltrans to determine if warning signs, such as a “Slow Trucks” sign (California Code W51), would be appropriate to inform drivers that slow-moving trucks may interfere with the flow of traffic on I-680.

Cumulative Measures

SFPUC WSIP Projects Construction Coordinator – Other Agencies

Measure 4.17-6: As required in Measure 4.8-1, contractors will be required to submit traffic control plans to the SFPUC, and in Measure 4.16-6a, the SFPUC will be required to identify a WSIP construction coordinator who will be responsible for coordinating the project-specific traffic control plans. The SFPUC WSIP construction coordinator will also consider the effects of any traffic generated by SFPUC maintenance activities and other SFPUC projects (as listed in Tables 4.17-1 through 4.17-6). The SFPUC WSIP construction coordinator will also coordinate with Caltrans, other county agencies, and local jurisdictions responsible for reviewing and/or approving the construction of other identified private and public development projects (as listed in Tables 4.17-1 through 4.17-6) so as to minimize traffic impacts on local access roads, particularly local streets where sensitive receptors (e.g., schools, residences, or hospitals) are located.

6.3.8 Air Quality

Program Measures

SJVAPCD Dust Control Measures

Measure 4.9-1a: In the San Joaquin Region, the SJVAPCD has determined that compliance with the following Regulation VIII (Fugitive PM_{10} Prohibitions) and Regulation IX (Mobile and Indirect Sources, Rule 9510, where applicable) control measures would mitigate PM_{10} impacts to a less-than-significant level. The SFPUC will include these measures, where applicable, in contract specifications:

SJVAPCD Basic Control Measures (applies to all construction sites)

- All disturbed areas, including storage piles, that are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover, or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported offsite, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day shall prevent carryout and trackout.

SJVAPCD Enhanced Control Measures (also applies when required to mitigate significant PM_{10} impacts)

- Traffic speeds on unpaved roads shall be limited to 15 mph.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.

SJVAPCD Additional Control Measures (also applies to construction sites that are large in area, located near sensitive receptors, or which for any other reason warrant additional emissions reductions)

- Wheel washers shall be installed for all exiting trucks, or all trucks and equipment leaving the site shall be washed off.
- Wind breaks shall be installed at windward side(s) of construction areas.
- Excavation and grading activity shall be suspended when winds exceed 20 mph and, regardless of windspeed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation.
- The area subject to excavation, grading, and other construction activity at any one time shall be limited.

SJVAPCD Rule 9510, Indirect Source Review, Section 6.1, Construction Equipment Emissions (applies to any project subject to discretionary approval by a public agency that ultimately results in the construction of a new building, facility, or structure or reconstruction of a building, facility, or structure for the purpose of increasing capacity or activity and also involving 9,000 square feet of space).

- 6.1.1: The exhaust emissions for construction equipment greater than fifty (50) horsepower used or associated with the development project shall be reduced by the following amounts from the statewide average as estimated by the ARB:
  - 6.1.1.1: 20% of the total NO_x emissions, and
  - 6.1.1.2: 45% of the total PM_{10} exhaust emissions.
- 6.1.2: An applicant may reduce construction emissions on-site by using less-polluting construction equipment, which can be achieved by utilizing add-on controls cleaner fuels, or newer lower emitting equipment.
- 6.3: The requirements listed in Section 6.1 above can be met through any combination of on-site emission reduction measures or off-site fees.

SJVAPCD Exhaust Control Measures

Measure 4.9-1b: To limit exhaust emissions within the San Joaquin Region, the SJVAPCD specifies the following exhaust controls for heavy-duty equipment (scrapers, graders, trenchers, earthmovers, etc.). The SFPUC will include these measures, where applicable, in contract specifications:

- Alternative-fueled or catalyst-equipped diesel construction equipment shall be used.
- Idling time (e.g., 10-minute maximum) shall be minimized.
- The hours of operation of heavy-duty equipment and/or the amount of equipment in use shall be limited.

- Fossil-fueled equipment shall be replaced with electrically driven equivalents (provided they are not run via a portable generator set).
- Construction shall be curtailed during periods of high ambient pollutant concentrations; this may include ceasing construction activity during the peak hour of vehicular traffic on adjacent roadways.
- Activity management (e.g., rescheduling activities to reduce short-term impacts) shall be implemented.

BAAQMD Dust Control Measures

Measure 4.9-1c: In the Sunol Valley, Bay Division, Peninsula, and San Francisco Regions, the BAAQMD has determined that implementation of the following control measures would mitigate PM_{10} impacts to a less-than-significant level. The SFPUC will include these measures, where applicable, in contract specifications:

BAAQMD Basic Control Measures (applies to all construction sites)

- All active construction areas shall be watered at least twice daily.
- All trucks hauling soil, sand, and other loose debris shall be covered *or* all trucks shall be required to maintain at least 2 feet of freeboard on public roads.
- All unpaved access roads, parking areas, and staging areas at construction sites shall either be paved, watered three times daily, or nontoxic soil stabilizers shall be applied.
- All paved access roads, parking areas, and staging areas at construction sites shall be swept daily (with water sweepers).
- If visible soil material is carried onto adjacent public streets, adjacent streets shall be swept daily (with water sweepers).

BAAQMD Enhanced Control Measures (also applies to sites over four acres)

- All inactive construction areas (previously graded areas inactive for 10 days or more) shall be hydroseeded or nontoxic soil stabilizers shall be applied.
- Exposed stockpiles (dirt, sand, etc.) shall be enclosed, covered, and watered, or nontoxic soil binders shall be applied.
- As feasible, traffic speeds on unpaved roads shall be limited to 15 mph.
- Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways.
- Disturbed areas shall be replanted as quickly as possible.

BAAQMD Optional Control Measures (also applies to construction sites that are large in area, located near sensitive receptors, or which for any other reason warrant additional emissions reductions)

- Wheel washers shall be installed for all exiting trucks, or all trucks and equipment leaving the site shall be washed off.
- Wind-breaks or trees/vegetative wind-breaks shall be installed at windward side(s) of construction areas.
- Excavation and grading activity shall be suspended when winds exceed 25 mph.
- The area subject to excavation, grading, and other construction activity at any one time shall be limited.

BAAQMD Exhaust Control Measures

Measure 4.9-1d: To limit exhaust emissions within the Sunol Valley, Bay Division, Peninsula, and San Francisco Regions, the SFPUC will implement the following exhaust controls, where applicable:

- Grid power will be used instead of diesel generators at all construction sites where it is feasible to connect to grid power. While it may not be practical to connect to grid power for pipeline projects (since construction sites keep moving along the alignments), grid power shall be used for projects with fixed locations, such as tunnel entry and exit shafts/portals.
- All WSIP contracts specifications shall include Sections 2480 and 2485, Title 13, California Code of Regulations, which limit the idling of all diesel-fueled commercial vehicles (weighing over 10,000 pounds, both California- or non-California-based trucks) to 30 seconds at a school or five minutes at any location. In addition, the use of diesel auxiliary power systems and main engines shall be limited to five minutes when within 100 feet of homes or schools while the driver is resting.
- All WSIP contracts specifications shall include Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements; emission standards for operation of any stationary, diesel-fueled, compression-ignition engines; and operation restrictions within 500 feet of school grounds when school is in session.
- A schedule of low-emissions tune-ups shall be developed and such tune-ups shall be performed on all equipment, particularly for haul and delivery trucks. A log of required tune-ups shall be maintained and a copy of the log shall be submitted to the SFPUC on a monthly basis for review.
- Low-sulfur fuels shall be used in all stationary and mobile equipment.

Health Risk Screening or Use of Soot Filters

Measure 4.9-2a: If truck volumes associated with a particular project along a particular haul route exceed 40,000 truck trips over the entire construction period, a health risk screening will be completed. If a potentially significant impact is indicated, a site-specific

health risk assessment (HRA) will be completed for the project. Any subsequent project-level analysis will consider DPM emission rates at the time of construction since emission rates are expected to decline in the future. Based on the site-specific HRA, a mitigation program will be developed implementing one or more the following methods of reducing DPM emission or exposure to a less-than-significant level:

- Modify haul routes to reduce exposure.
- Require use of biodiesel fuel, which reduces DPM emissions.
- Require new construction equipment to be utilized. Newer construction equipment is far cleaner than old equipment.
- Require that the vehicle fleet include trucks with soot filters (particulate traps) within the equipment fleet.
- Temporarily vacate affected receptors.
- Any other effective means of reducing DPM emissions or exposure.

Vacate SFPUC Land Managers' Residences in Sunol Valley

Measure 4.9-2b: The two SFPUC Land Managers' residences in the Sunol Valley will be vacated during construction of the Calaveras Dam (SV-2) or Treated Water Reservoirs (SV-5) projects. Alternatively, a health risk screening could be completed to determine health risks at these residences from either of these two projects. If a potentially significant impact is indicated, a health risk assessment will be completed, and measures will be implemented, as set forth in Measure 4.9-2a.

Tunnel Gas Odor Control

Measure 4.9-3: For any projects that would require a tunnel ventilation system, if hydrogen sulfide gas or any other odorous gases (including diesel exhaust) are encountered during tunnel excavation and become a nuisance odor problem (i.e., odor complaints are received), water scrubbers will be added to the ventilation system and appropriate chemicals will be added to remove the nuisance odors.

Collective Measures

Dust and Exhaust Control Measures for All WSIP Projects

Measure 4.16-7a: Measures 4.9-1a through 4.9-1d requires specific projects to implement dust and exhaust control measures. To address collective construction-related air quality impacts, these measures will be required for all WSIP projects as applicable and required by SJVAPCD and BAAQMD.

Health Risk Screening or Use of Soot Filters for All Projects in the San Joaquin and Sunol Valley Regions

Measure 4.16-7b: Measure 4.9-2a requires specific projects to either conduct a health risk assessment or use soot filters to reduce DPM emissions associated with haul trucks. To address collective DPM impacts, this measure will be required for all WSIP projects in the

San Joaquin and Sunol Valley Regions. This measure would only apply in the Sunol Valley Region if, under Measure 4.9-2b, the SFPUC elects not to vacate the two SFPUC Land Managers' residences in the Sunol Valley. If this requirement is applied to the New Irvington Tunnel project (SV-4), it shall be applied to both the Sunol Valley and Fremont tunnel portals, taking into account truck traffic from other WSIP projects in the vicinity of both portals.

Vacate SFPUC Land Managers' Residences for All Projects in the Sunol Valley Region

Measure 4.16-7c: Measure 4.9-2b requires the two SFPUC Land Managers' residences in the Sunol Valley to be vacated during construction of the Calaveras Dam (SV-2) and Treated Water Reservoirs (SV-5) projects. Alternatively, a health risk screening could be completed to determine health risks at these residences. If a potentially significant impact is indicated, a health risk assessment will be completed. To address collective DPM impacts, this measure will be required for all WSIP projects in the Sunol Valley Region.

6.3.9 Noise and Vibration

Program Measures

Noise Controls

Measure 4.10-1a: SFPUC Construction Measure #6 for noise requires compliance with local noise ordinances to the extent feasible. Many of these ordinances restrict hours when construction can occur, but do not specify noise limits for construction noise. For most projects, the SFPUC will conduct construction activities during the daytime hours to the extent feasible. However, if nighttime construction cannot be avoided, noise generated by these activities will be required to comply with applicable noise ordinance nighttime limits or not exceed 50-dBA sleep interference criterion (with windows open at night) to the extent feasible.

To ensure that construction noise impacts are mitigated to a less-than-significant level, all WSIP projects located within 500 feet of any noise-sensitive receptors (e.g., residences, schools, childcare centers, churches, hospitals, and nursing homes) will be required to implement appropriate noise controls to reduce daytime construction noise levels to meet the 70-dBA daytime speech interference criterion to the extent feasible. For nighttime construction, all WSIP projects located within 3,000 feet of any noise-sensitive receptors will be required to implement appropriate noise controls to maintain noise levels at or below any applicable ordinance nighttime noise limits or the 50-dBA nighttime sleep interference criterion to the extent feasible. Such controls could include any of the following, as appropriate:

- Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will be used for all equipment and trucks in order to minimize construction noise impacts. If feasible, construction equipment noise will not exceed the mitigated noise levels listed in **Table 4.10-4** (see measure below for limits on impact equipment).

- If impact equipment (e.g., jack hammers, pavement breakers, and rock drills) is used during project construction, hydraulically or electric-powered equipment will be used wherever feasible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust will be used (a

- muffler can lower noise levels from the exhaust by up to about 10 dBA). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dBA. Quieter procedures, such as drilling rather than impact equipment, will be used whenever feasible.

- Pile holes will be pre-drilled wherever feasible to reduce potential noise and vibration impacts. Where feasible, sonic or vibratory pile drivers will be used instead of impact pile drivers (sonic pile drivers are only effective in some soils).

- Pile driving activities shall be prohibited during the evening and nighttime hours (7 p.m. to 7 a.m.).

- Operation of equipment requiring use of back-up beepers will be avoided near sensitive receptors to the extent feasible during nighttime hours (10 p.m. to 7 a.m.).

- Stationary noise sources will be located as far from sensitive receptors as feasible. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) will be used to ensure local noise ordinance limits are met to the extent feasible. Enclosure opening or venting will face away from sensitive receptors. If any stationary equipment (e.g., ventilation fans, generators, dewatering pumps) is operated beyond the time limits specified by the pertinent noise ordinance, this equipment will conform to the affected jurisdiction's pertinent day and night noise limits to the extent feasible.

- Material stockpiles as well as maintenance/equipment staging and parking areas will be located as far as feasible from residential and school receptors.

- Wherever feasible, pipeline alignments will be located at least 100 feet away from sensitive receptors.

- Where pipeline construction zones are within 100 feet of school classrooms or childcare facilities, pipeline construction activities (or at least the noisier phases of construction) will be scheduled on weekend or school vacation days to the extent feasible, avoiding weekday hours when schools are in session. If construction must occur when school is in session, interior noise levels in classrooms will not exceed 60 dBA if possible to avoid speech interference problems, which would allow for a maximum exterior noise level of 70 to 80 dBA, depending on whether windows are open or closed.

- Given the long duration of construction activities at tunnel shafts/portals and proposed nighttime activities, tunnel-related construction activities will be designed to comply with nighttime noise limits specified in local noise ordinances. Measures that could be implemented to comply with these limits include: using quiet ventilation fans (pure tone components of fan noise will be considered), using line power instead of generators, erection of temporary sound barriers, restricting heavy equipment operation during the nighttime hours, using nonmetallic containers in the muck removal system to prevent clanging/banging noises, limiting controlled detonations in the tunnel shaft/portal vicinities to the daytime hours, retrofitting windows/doors of affected homes, and/or prohibiting use of backup alarms on equipment during the nighttime hours.

- Where controlled detonation activities will occur, surrounding cities and residents should be notified of the blasting schedule, indicating the time range when blasting could occur (hours and duration).

- Proposed jack-and-bore pits will be located as far from sensitive receptors as technically feasible. If ventilation fans, dewatering pumps, or generators are required as part of this type of pipeline crossing, such equipment will comply with daytime and nighttime noise limits specified in pertinent noise ordinances to the extent feasible (also see Measure 4.9-1d in Section 4.9, Air Quality, for additional restrictions on generator operation).

- Wherever necessary, temporary or permanent noise barriers will be erected to maintain construction noise levels at or below the 70-dBA daytime speech interference criterion and the 50-dBA nighttime sleep interference criterion.

- A designated project liaison will be responsible for responding to noise complaints during the construction phases. The name and phone number of the liaison will be conspicuously posted at construction areas and on all advanced notifications. This person will take steps to resolve complaints, including periodic noise monitoring, if necessary. Results of noise monitoring will be presented at regular project meetings with the project contractor, and the liaison will coordinate with the contractor to modify any construction activities that generated excessive noise levels to the extent feasible.

- A reporting program will be required for each project that documents complaints received, actions taken to resolve problems, and effectiveness of these actions.

Vacate SFPUC Caretaker's Residence at Tesla Portal

Measure 4.10-1b: The SFPUC caretaker's residence at Tesla Portal will be vacated during construction of the Advanced Disinfection (SJ-1) and Tesla Portal Disinfection (SJ-5) projects as well as those portions of the SJPL System (SJ-3) and SJPL Rehabilitation (SJ-4) projects located at Tesla Portal.

Limit Hourly Truck Volumes

Measure 4.10-2a: In addition to SFPUC Construction Measure #6 for noise, which requires compliance with local noise ordinances to the extent feasible, haul and delivery truck routes for all WSIP projects will avoid local residential streets and will follow local designated truck routes to the extent feasible. Total project-related haul and delivery truck volumes on any particular haul truck route will be limited to 80 trucks per hour.

Restrict Truck Operations

Measure 4.10-2b: Haul and delivery trucks will be prohibited from operating within 200 feet of any residential uses during the nighttime hours (10 p.m. to 7 a.m.). If there are receptors, but they are beyond 200 feet from the haul route, limited truck operations will be allowed during the more sensitive nighttime hours, but noise generated by these operations cannot exceed the 50-dBA sleep interference criterion at the closest receptors. If trucks must operate during these hours and residential uses are located within 200 feet of the haul route, deliveries will be made to staging areas outside residential areas, then transferred to the construction site during daytime hours (7 a.m. to 7 p.m.).

Vacate SFPUC Land Manager's Residence

Measure 4.10-2c: To minimize nighttime noise impacts, the SFPUC Land Manager's residence adjacent to Alameda East Portal will be vacated during off-site truck operations associated with the New Irvington Tunnel project (SV-4), if truck operations occur during the nighttime hours (10 p.m. to 7 a.m.) and are estimated to exceed the 50-dBA sleep interference criterion at this residence.

Vibration Controls to Prevent Cosmetic or Structural Damage

Measure 4.10-3a: To prevent cosmetic or structural damage to adjacent or nearby structures, the SFPUC will incorporate restrictions into all contract specifications (primarily for sheetpile driving, pile driving, or tunnel construction activities), whereby surface vibration will be limited to 0.2 in/sec PPV for continuous vibration (e.g., vibratory equipment and impact pile drivers) and 0.5 in/sec PPV for controlled detonations at the closest receptors to ensure that cosmetic or structural damage does not occur.

Limit Vibration Levels at or Below Vibration Perception Threshold

Measure 4.10-3b: For nighttime construction activities, the SFPUC will maintain vibration levels at or below the vibration perception threshold (0.012 in/sec PPV) at adjacent properties (or in accordance with local ordinances) to the extent feasible. If vibration complaints are received during facility construction, operational adjustments will be made (e.g., restricting use of equipment causing vibration disturbance during the nighttime hours or slowing the pace of its operation), as necessary, to reduce vibration annoyance effects.

Limit Tunnel-Related Detonation to Daylight Hours

Measure 4.10-3c: The SFPUC will limit controlled detonation associated with tunnel construction to the daylight hours, Monday through Saturday.

Collective Measures

Limiting Hourly Truck Volumes and Restricting Truck Operations on Haul Routes for Multiple WSIP Projects

Measure 4.16-8a: Measures 4.10-2a and 4.10-2b outline restrictions and guidelines for daytime and nighttime truck operations on local roadways. To address collective truck-related noise impacts, these measures will be applied to total haul and delivery truck volumes on any particular haul truck route that are attributable to all WSIP projects, including the Tesla Portal, Irvington Portal, Lower Crystal Springs Dam vicinities as well as haul routes in San Francisco Region. Therefore, total truck volumes from all WSIP projects on a particular route will not exceed 80 trucks per hour (so as not to exceed the 70-dBA speech interference criterion during the daytime hours) and will be restricted near sensitive receptors (to meet the 50-dBA sleep interference criterion) during the nighttime hours.

Vacate Land Manager's Residence for All Projects in Sunol Valley Region

Measure 4.16-8b: Measure 4.10-2c requires the SFPUC Land Manager's residence adjacent to Alameda East Portal to be vacated during construction truck operations associated with the New Irvington Tunnel project (SV-4). To address collective noise

impacts, this residence will be vacated during construction truck operations associated with all WSIP projects in this region, if collective daytime truck volumes exceed the 70-dBA speech interference criterion (7 a.m. to 10 p.m.) or nighttime truck volumes exceed the 50-dBA sleep interference criterion (10 p.m. to 7 a.m.).

Cumulative Measures

Coordination of Truck Traffic on Local Streets

Measure 4.17-8: The SFPUC WSIP construction coordinator designated in Measure 4.17-6 will also be responsible for coordinating truck traffic generated on these same streets by SFPUC maintenance activities and other SFPUC projects (as listed in Tables 4.17-1 through 4.17-6) so that SFPUC-related truck noise increases are maintained at or below threshold levels specified in Measures 4.10-2a and 4.10-2b to the extent feasible (80 trucks per hour along a haul/delivery route and restricted nighttime truck operations).

6.3.10 Public Services and Utilities

Program Measures

Notify Neighbors of Potential Utility Service Disruption

Mitigation 4.11-1a: As part of the neighborhood notice, the SFPUC will notify residents and businesses in project area of potential utility service disruption two to four days in advance of construction.

Locate Utility Lines Prior to Excavation

Measure 4.11-1b: Prior to excavation, the SFPUC or its contractors will locate overhead and underground utility lines, such as natural gas, electricity, sewer, telephone, fuel, and water lines, that may be encountered during excavation work prior to opening an excavation.

Confirmation of Utility Line Information

Measure 4.11-1c: The SFPUC or its contractors will find the exact location of underground utilities by safe and acceptable means. Information regarding the size, color, and location of existing utilities must be confirmed before construction activities commence.

Safeguard Employees from Potential Accidents Related to Underground Utilities

Measure 4.11-1d: While any excavation is open, the SFPUC or its contractors will protect, support, or remove underground utilities as necessary to safeguard employees.

Notify Local Fire Departments

Measure 4.11-1e: The SFPUC or its contractors will notify local fire departments any time damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety.

Emergency Response Plan

Mitigation 4.11-f: The SFPUC will develop an emergency response plan in the event of a leak or explosion prior to commencing construction activities.

Prompt Reconnection of Utilities

Measure 4.11-2g: The SFPUC or its contractors will promptly reconnect any disconnected utility lines.

Coordinate Final Construction Plans with Affected Utilities

Measure 4.11-1h: The SFPUC or its contractors will coordinate final construction plans and specifications with affected utilities.

Waste Reduction Measures

Measure 4.11-2: The following requirements will be incorporated into contract specifications for each WSIP project:

The contractor(s) will obtain any necessary waste management permits prior to construction and will comply with conditions of approval attached to project implementation. As part of the waste management permit process, the contractor(s) will submit a solid waste recycling plan to the affected agencies. Elements of the plan will likely include, but are not necessarily limited to, the following:

- Identification of the types of debris that will be generated by the project and identify how all waste streams will be handled.
- Actions to reuse or recycle construction debris and clean excavated soil to the extent possible.
- Actions to divert at least 50% of inert solids (asphalt, brick, concrete, dirt, fines, rock, sand, soil, and stone) from disposal in a landfill.

6.3.11 Recreational Resources

Program Measures

Coordination with Golf Course/Recreational Facility Managers

Measure 4.12-1: Where golf courses or other recreational facilities would be directly affected by pipeline construction, the SFPUC will coordinate with facility managers to minimize adverse impacts on golfers and other recreational users.

Appropriate Siting of Proposed Facilities

Measure 4.12-2: The SFPUC will locate WSIP project facilities on park and recreation properties in consultation with park planning staff to minimize the direct loss of recreation and play space and to minimize any inconvenience to park, playground, or golf course users associated with the installation of non-recreational facilities within recreational areas.

6.3.12 Agricultural Resources

Program Measures

Supplemental Noticing and Soil Stockpiling

Measure 4.13-1a: For the San Joaquin Pipeline projects (SJPL System, SJ-3, and SJPL Rehabilitation, SJ-4), as part of the SFPUC Construction Measure #1 for neighborhood notice, advanced notification will include the name and number of an SFPUC staff person who can be contacted to discuss special needs and to work out accommodations to minimize temporary disruption to agricultural activities. The SFPUC will stockpile and replace topsoil in mapped areas of Prime and Unique Farmland and Farmland of Statewide Importance that would be temporarily disturbed by pipeline construction, unless other actions are required under specific agreements with individual land owners. (The SFPUC typically holds easements for work on its projects, but prior owners may have residual rights to use the rights-of-way for agricultural purposes. The SFPUC will work with farmers under the terms of these agreements.)

Avoidance or Soil Stockpiling

Measure 4.13-1b: The SFPUC will minimize any potential impacts on agricultural lands in the Sunol Valley by avoiding these resources wherever possible. Where this is not possible, topsoil along the pipeline right-of-way will be stockpiled, replaced, and hydroseeded to prevent erosion, unless other actions are required as a result of contracts affecting use of the property or under specific agreements with individual land owners.

Siting Facilities to Avoid Prime Farmland

Measure 4.13-2: The SFPUC will avoid areas identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance in the siting of facilities for the 40-mgd Treated Water project (SV-3), Treated Water Reservoirs project (SV-5), and ancillary power supply facilities for the SJPL System project (SJ-3). If avoidance is not feasible, the SFPUC will adopt a permanent set-aside for an equivalent acreage of similarly-valued farmland in the area.

6.3.13 Hazards

Program Measures

Site Health and Safety Plan

Measure 4.14-1a: For all projects requiring excavation where the site assessment conducted in accordance with SFPUC Construction Measure #7 indicates the potential to encounter hazardous materials in the soil or groundwater, the contractor will prepare a site health and safety plan identifying the chemicals present, potential health and safety hazards, monitoring to be performed during site activities, soils-handling methods required to minimize the potential for exposure to harmful levels of any chemicals identified in the soil, appropriate personnel protective equipment, and emergency response procedures.

Materials Disposal Plan

Measure 4.14-1b: For all projects requiring excavation where the site assessment conducted in accordance with SFPUC Construction Measure #7 indicates the potential to encounter hazardous materials in the soil, the contractor will prepare a materials disposal plan that specifies the disposal method and approved disposal site for the soil and will provide written documentation that the disposal site will accept the waste.

Coordination with Property Owners and Regulatory Agencies

Measure 4.14-1c: Based on regulatory agency file reviews conducted in accordance with SFPUC Construction Measure #7, the SFPUC will assess the potential to encounter unacceptable levels of hazardous materials at known environmental cases, for construction activities to cause groundwater plume migration or interfere with ongoing remediations at known environmental cases, and for increased water levels in reservoirs or lakes to inundate known environmental cases. Should the review indicate that the project could encounter unacceptable levels of hazardous materials or interfere with a remediation, the SFPUC will contact the site owner (or responsible SFPUC department for the Peninsula Sportsmen's Club and Pacific Rod and Gun Club) and responsible regulatory agency to determine appropriate construction modifications or remediation necessary to avoid adverse effects during construction and operation of the project. Construction modifications will be designed to reduce groundwater plume migration or interference with the remediation; alternatively, modifications will be made to the remediation activities during construction to reduce interference with remediation activities to avoid encountering unacceptable levels of hazardous materials. The SFPUC will implement the requirements of the responsible regulatory agency.

Health Risk Screening and Airborne Asbestos Monitoring Plan

Measure 4.14-2: For tunneling projects where soil or rock containing naturally occurring asbestos has been identified, the SFPUC will conduct a health risk screening assessment to identify acceptable levels of asbestos in tunnel emissions based on site conditions and proximity to receptors. Prior to operation of the tunnel exhaust system, the contractor will be required to prepare an airborne asbestos monitoring plan for approval by the BAAQMD. The plan will specify the identified asbestos criterion, monitoring that will be conducted to identify asbestos concentrations in tunnel emissions, sampling methods, analytical methods, and corrective actions that will be taken if the asbestos criterion is exceeded. Additional dust filtration will be added to the tunnel exhaust system if the criterion is exceeded.

Hazardous Building Materials Surveys and Abatement

Measure 4.14-5: For all WSIP projects involving demolition or renovation of existing facilities, the SFPUC will retain a registered environmental assessor or a registered engineer to perform a hazardous building materials survey for each structure prior to demolition or renovation activities. If any friable asbestos-containing materials, lead-containing materials, or hazardous components of building materials are identified, adequate abatement practices, such as containment and/or removal, will be implemented prior to demolition or renovation. Any PCB-containing equipment or fluorescent lights containing mercury vapors will also be removed and disposed of properly.

6.3.14 Energy Resources

Program Measures

Incorporation of Energy Efficiency Measures

Measure 4.15-2: Consistent with the Energy Action Plan II priorities for reducing energy usage, the SFPUC will ensure that energy efficient equipment is used in all WSIP projects. A repair and maintenance plan will also be prepared for each facility to minimize power use. The potential for use of renewable energy resources (such as solar power) at facility sites will be evaluated during project-specific design.

6.4 Mitigation Measures to Minimize Water Supply and System Operations Impacts

This section presents all mitigation measures for impacts described in Chapter 5. Mitigation measures for impacts identified in Sections 5.3 through 5.6 are presented under the respective geographic area (i.e., watershed or groundwater basin). In some cases, a mitigation measure would mitigate more than one impact, and the mitigation measure numbering corresponds to the first impact identified. Impact and mitigation summary tables for Section 5.3, Tuolumne River Watershed and Downstream Waterbodies; Section 5.4, Alameda Creek Watershed Streams and Reservoirs; Section 5.5, San Francisco Peninsula Streams and Reservoirs; and Section 5.6, Westside Groundwater Basin, are presented in Section 6.6.

6.4.1 Plans and Policies

System Measures

None required.

6.4.2 Tuolumne River System and Downstream Water Bodies

Stream Flow and Reservoir Water Levels

System Measures

None required.

Geomorphology

System Measures

None required.

Surface Water Quality

System Measures

None required.

Surface Water Supplies

System Measures

None required.

Groundwater

System Measures

None required.

Fisheries

System Measures

Overview of Measures 5.3.6-4a, 5.3.6-4b, and 5.3.7-6

The SFPUC will attempt to implement Measure 5.3.6-4a as described below, which could mitigate both Impacts 5.3.6-4 and 5.3.7-6 to a less than significant level. Measure 5.3.6-4a involves some uncertainty because its implementation depends on the SFPUC negotiating and reaching agreement with MID/TID and possibly other water agencies. If Measure 5.3.6-4a proves to be infeasible, the SFPUC will implement Measure 5.3.6-4b to lessen fisheries impacts and Measure 5.3.7-6 to lessen impacts on riparian vegetation.

Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water

Measure 5.3.6-4a: The SFPUC will pursue a water transfer arrangement with MID/TID and/or other water agencies such that the water acquired is developed through actions that result in reduction of demand on Don Pedro Reservoir as a result of conservation, improved delivery efficiency, inter-agency transfer of conserved water, or use of an alternative supply such as groundwater. The TID and MID would deliver less water from Don Pedro Reservoir. The consequent increase in water storage in Don Pedro Reservoir would offset the reduction in inflow to Don Pedro Reservoir attributable to the WSIP. The release pattern from La Grange Dam would be the same or similar to the existing condition thus lessening or eliminating Impacts 5.3.6-4 and 5.3.7-6. The actions necessary to reduce demand for Don Pedro Reservoir water may themselves have environmental effects. See Section 6.5 for a review of potential environmental effects associated with the expected actions of this mitigation measure. Further environmental review would be undertaken prior to approving a specific water transfer agreement.

Fishery Habitat Enhancement

Measure 5.3.6-4b: If Measure 5.3.6-4a is not implemented, then the SFPUC will mitigate potential fishery effects on the lower Tuolumne River by implementing (or funding) one of

the following two habitat enhancement actions that are designed to sustain fishery resources under the river's flow regime, which are consistent with the Habitat Restoration Plan for the Lower Tuolumne River Corridor: gravel augmentation/habitat enhancement to provide salmonid spawning and rearing habitat, or isolating or filling a captured former gravel quarry pit along the river that provides habitat for salmonid predators.

The gravel augmentation/habitat enhancement project will be implemented to increase salmonid spawning success and to improve the survival of rearing salmonids in the reach of the river downstream of La Grange Dam. Spawning success will be improved by the addition of suitable gravel to the stream channel. Other habitat features will be created to provide cover for juvenile salmonids and to increase the availability of substrate for macroinvertebrates that would be used as food by rearing juvenile salmon and steelhead. The gravel augmentation/habitat enhancement project will involve the planning, design, permitting, purchase, placement, and monitoring of suitable gravel and associated habitat enhancements at three riffle locations within the spawning reach between Basso Bridge and La Grange Dam. The three locations will meet the criteria for suitable habitat as described in the Habitat Restoration Plan for the Lower Tuolumne River Corridor. The gravel will preferentially be rounded river rock of native origin that would be sized and pre-washed before placement into the river. The gravel augmentation/habitat enhancement project will also involve the addition of large woody debris and boulders to create increased habitat complexity and diversity at each of the three enhancement sites. After construction of the gravel augmentation/habitat enhancement project, it will be surveyed to establish its baseline condition. A survey of the three sites will be made at a minimum of five-year intervals by a qualified fisheries biologist. The fisheries biologist will determine whether the three sites continue to meet established criteria for salmonid spawning and rearing habitat. If the sites do not meet the criteria, as part of its long-term operations, the SFPUC will make the improvements necessary to return it to the baseline conditions.

As an alternative to the gravel augmentation project, the SFPUC will remove from the lower river channel one of the former gravel quarry pits that has been "captured" by the river and acts as predator zones for fish such as largemouth and striped bass to prey on rearing and emigrating juvenile salmonids. Removal could be accomplished by filling the pit or installing a levee berm around the pit to isolate it permanently from the river channel. The SFPUC could implement this action directly or fund implementation by another entity involved in river restoration.

The performance standard for gravel pit removal would be an established permanent reduction in area of salmonid predator habitat. The SFPUC will monitor the pit removal project at five-year intervals. If floods have eroded the fil1 or damaged the levees in a manner that restores salmonid predator habitat, the SFPUC will make the necessary repairs. The SFPUC will continue periodic monitoring and repair as part of long-term system operations.

Terrestrial Biological Resources

System Measures

Controlled Releases to Recharge Groundwater in Streamside Meadows and Other Alluvial Deposits

Measure 5.3.7-2: To mitigate for potential WSIP effects on meadow resources along the Tuolumne River below Hetch Hetchy Reservoir, the SFPUC will manage releases from

Hetch Hetchy Reservoir during the spring to recharge groundwater in the riverside meadows in the Poopenaut Valley and streamside alluvial deposits. The goal of the release pattern will be to approximate conditions characteristic of most Sierra meadows, which are mainly wetlands or semi-wetlands supporting a cover of both emergent wetlands plants and upland vegetation (Ratliff, 1982), and which depend on precipitation and upslope flows to recharge the upper soil layers with water (Ratliff, 1985). The performance standard to be achieved by this measure is no net loss of the extent, diversity, and condition of the existing meadow and wetland vegetation types in the Poopenaut Valley.

The SFPUC will manage reservoir releases for this purpose by releasing the expected available volume of water in the reservoir in a pattern that provides flows of a magnitude that inundate the meadows and streamside alluvial deposits for as long as possible. For example, rather than making releases at a constant rate each day (e.g., releasing 1,000 cfs

for seven days), the SFPUC could release the same volume of water but with varying cfs rates, creating flow pulses to meet the objective.

As part of this measure the SFPUC will gather baseline data regarding the extent, species composition and condition of the existing meadow vegetation within the Poopenaut Valley. Some of these environmental baseline data may be available as a result of current study efforts in the Poopenaut Valley[5]. As needed, the SFPUC will augment this information by carrying out vegetation composition surveys in the meadow before implementing the WSIP and at 5 year intervals after WSIP implementation to assess the efficacy of mitigation releases in maintaining or improving the percentage cover of meadow species as described by Ratliff (1985). The basic methodology for baseline vegetation survey and subsequent mitigation monitoring will be generally accepted quantitative vegetation sampling methods to permit statistical comparison of vegetation composition over time, as well as mapping the meadow vegetation in the Poopenaut Valley. The SFPUC will retain the services of a qualified biologist to assist in shaping the releases from Hetch Hetchy Reservoir in consideration of baseline and future meadow vegetation data. If a significant decline in the extent or diversity of native meadow vegetation occurs, releases will be modified as needed to achieve the mitigating effect of sustaining the existing meadow communities.

Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water

See **Measure 5.3.6-4a** in the Fisheries section, above. This measure also addresses impact 5.3.7-6 Impacts on biological resources along the Tuolumne River below La Grange. The SFPUC will attempt to implement Measure 5.3.6-4a as described above, which could mitigate both Impacts 5.3.6-4 and 5.3.7-6 to a less than significant level. Measure 5.3.6-4a involves some uncertainty because its implementation depends on the SFPUC negotiating and reaching agreement with MID/TID and possibly other water agencies. If Measure 5.3.6-4a proves to be infeasible, the SFPUC will implement Measure 5.3.6-4b to lessen fisheries impacts and Measure 5.3.7-6 to lessen impacts on riparian vegetation.

Lower Tuolumne River Riparian Habitat Enhancement

Measure 5.3.7-6: To mitigate the WSIP effects on riparian vegetation, the SFPUC will both protect and enhance one mile of riparian vegetation along the contemporary floodplain of the lower Tuolumne River. This will include funding the acquisition of fee title to or a conservation easement over riparian land totaling one mile (consisting of one or multiple sites) in order to permanently protect that land, and also funding riparian enhancement and on-going vegetation management to maintain the enhanced riparian values in perpetuity along one mile of river. The enhancement and management may be carried out along one river mile either on the land acquired by the SFPUC as described above or on land already under the permanent management of a public agency or conservation organization.

The SFPUC will implement this measure consistent with the Habitat Restoration Plan for the Lower Tuolumne River Corridor (McBain and Trush, 2000) and in coordination with the Tuolumne River Technical Advisory Committee. The SFPUC will also strive to

5 In 2006 the SFPUC, National Park Service (and USFWS) began a collaborative study effort in the Poopenaut Valley. The effort has led to geomorphology test releases in May 2006, fieldwork in the channel in 2006 and 2007 to examine sediment transport and deposition relationships with flow. Two transects with ten recording piezometers have been installed across the meadow to measure groundwater recharge and drainage patterns. Supplementary stream staff gages have been installed to allow manual readings during high flows. Surveys have been done of the meadow to define the topography and the location and elevation of the piezometers. Infiltration of water from the stream to the meadow soils will be monitored during high flows to develop a better understanding of groundwater dynamics in the meadow so that reservoir operations, flow pulses, and minimum streamflow releases can be managed to improve meadow conditions within the constraints of water supply and facility limitations.

implement these projects in partnership with those groups currently working to restore riparian floodplains on the lower Tuolumne River.

The SFPUC may implement riparian enhancement in accordance with site locations and plans already developed as part of the Habitat Restoration Plan for the Lower Tuolumne River Corridor or on other appropriate sites along the river. For sites that haven't already had plans developed, a riparian enhancement plan will be prepared for each. The plan shall include, but not be limited to, the following:

- Clearly stated objectives and goals consistent with the Habitat Restoration Plan for the Lower Tuolumne River Corridor (McBain and Trush, 2000).
- Location, size, and type of mitigation actions proposed.
- Documentation of performance and monitoring standards.
- Performance and monitoring standards shall indicate success criteria to be met within 5 years for vegetation, removal of exotic species, etc. Adaptive management standards shall include contingency measures that shall outline clear steps to be taken if and when it is determined, through monitoring or other means, that the enhancement or restoration techniques are not meeting success criteria.
- Documentation of the necessary long-term management and maintenance requirements, and provisions for sufficient funding.

Recreational and Visual Resources

System Measures

None required.

Energy Resources

System Measures

None required.

6.4.3 Alameda Creek Watershed Streams and Reservoirs

Stream Flow and Reservoir Water Levels

System Measures

Diversion Tunnel Operation

Measure 5.4.1-2: The SFPUC will establish and implement written operational criteria for the Alameda Creek Diversion Dam that directs that the diversion dam and tunnel shall be operated to pass flows down Alameda Creek when diversion of those flows is not required to maintain desired levels in Calaveras Reservoir in order to provide the maximum possible days of winter and spring flows in Alameda Creek below the diversion dam.

This measure reinforces the way the SFPUC generally operates the diversion tunnel now: that diversion gates are closed in the spring once desired Calaveras Reservoir storage have been reached. However, at times additional flows have been diverted from Alameda Creek after reservoir storage levels have been achieved such that the "excess" water has subsequently been released from the reservoir to maintain the appropriate water level. This measure would formalize Alameda Creek diversion procedures to maintain flows in Alameda Creek to the extent they are not needed to achieve required reservoir storage. This measure would reduce the flow reduction impact but not to a level that is less than significant.

Geomorphology

System Measures

None required.

Surface Water Quality

System Measures

None required.

Groundwater

System Measures

None required.

Fisheries

System Measures

Minimum Flows for Resident Trout on Alameda Creek

Measure 5.4.5-3a: The SFPUC shall develop and carry out as part of the implementation of the Calaveras Dam Replacement (SV-2) project, an operational plan to implement minimum bypass flows when precipitation generates runoff into the creek below the diversion dam to the Calaveras Creek confluence from December 1 through April 30 to support spawning and egg incubation for resident trout as well as breeding habitat for other native stream-dependent amphibians. This is the period when winter precipitation typically would produce flows for spawning and egg incubation and breeding habitat for other native stream-dependent species. The operational plan will identify the specific minimum flow requirements to support resident trout spawning and egg incubation, and a detailed monitoring plan to survey and document trout spawning and egg incubation and any diversion facility modifications that are needed to implement the minimum stream flows. This measure will be implemented in conjunction with the proposed bypass flows at the diversion dam to meet the 1997 CDFG MOU flow requirements.

Minimum flow requirements to support resident trout spawning and egg incubation vary depending on stream reach conditions. Although site-specific studies are needed to determine an appropriate minimum flow requirement for each specific creek reach, based on the general size and characteristics of the Alameda Creek channel immediately downstream of the diversion structure it has been suggested that a minimum flow on the

order of 10 cfs may be needed to support trout spawning and egg incubation. The SFPUC's Natural Resources Division will complete the site-specific studies needed to determine the appropriate minimum stream flow for this reach of the creek; studies may show that the minimum flow requirement is more or less than 10 cfs. This minimum flow requirement would be met when precipitation would naturally generate runoff in the creek (below the diversion dam) under unimpaired conditions between December 1 and April 30. When precipitation generates runoff in the creek, the SFPUC shall provide for bypass of flow up to the required minimum flow amount. The operational plan will allow for adapting minimum flow amounts to support resident trout spawning and egg incubation and other native stream-dependent species based on the monitoring results and best available scientific information.

The monitoring plan will be provided to appropriate resource agencies for review and comment and will subsequently be implemented by the SFPUC's Natural Resources Division staff. Monitoring results shall be provided to the resource agencies as requested. Monitoring shall occur for a minimum of five years and a maximum of ten years following completion of the Calaveras Dam Replacement project. At the completion of the monitoring period the SFPUC shall produce a draft comprehensive report describing the methods, data collected, and results used to assess the performance of the minimum streamflow in providing suitable habitat for resident trout spawning and egg incubation.

The Alameda Creek Fisheries Restoration Workgroup is currently overseeing collaborative studies to better characterize the flow-habitat relationships for trout spawning within Alameda Creek, and the SFPUC is providing staff and funding to support this effort. Information from these studies will also be used in developing the specific range of minimum stream flows needed to support suitable habitat within the reach below the diversion dam to the Calaveras Creek confluence.

This measure addresses two areas of impact to the resident trout fishery in Alameda Creek below the diversion dam. First, it addresses the decrease in flow below the diversion dam that would occur under the WSIP as a result of re-instituting flow diversions to Calaveras Reservoir once the dam is replaced (WSIP Project SV-2) and current DSOD storage capacity restrictions are removed. Second, it addresses the loss of fish from the lower creek system that would result from fish entrainment through the unscreened diversion tunnel to Calaveras Reservoir. Providing for minimum stream flows in Alameda Creek below the diversion dam, as required by the mitigation measure, would support resident trout spawning and egg incubation and it is expected that this measure would be sufficient to sustain the trout population in this reach of the creek. This would fully address/mitigate for both areas of WSIP impact to the resident trout fishery below the diversion dam. If monitoring indicates that this measure is adequate to sustain the resident trout population below the diversion dam, then no additional mitigation action would be required. If monitoring indicates that this measure does not sustain the resident trout fishery in this reach, then the SFPUC shall either modify the minimum stream flow to enhance downstream habitat conditions to fully meet the mitigation requirement or also implement Measure 5.4.5-3b Diversion Restrictions or Fish Screens.

Alameda Diversion Dam Diversion Restrictions or Fish Screens

Measure 5.4.5-3b: If, after 10 years of monitoring results for Measure 5.4.5-3a, Minimum Flows for Resident Trout in Alameda Creek, indicate that the measure does not sustain the resident trout population in Alameda Creek below the diversion dam, then the SFPUC shall also implement additional measures as follows: either implement seasonal restrictions on Alameda Creek diversions to Calaveras Reservoir to protect the downstream resident trout fishery during the critical spawning period (December 1 through April 30) or install and operate a fish passage barrier to "screen" the diversion facility (screening could consist of a behavioral barrier, such as electrical or sound barrier that deters fish, or a physical barrier – such as a screen facility).

SFPUC shall consult with the appropriate resource agencies, including CDFG, to first review the monitoring results for Measure 5.4.5-3a and determine the need for any further mitigation actions. If needed, SFPUC will consult with the appropriate resource agencies to develop appropriate seasonal restrictions on diversions. This could involve establishing a set annual time period for diversion restrictions or annual monitoring of fishery conditions that would then trigger implementation of diversion restrictions.

Alternatively, the SFPUC will implement a fish passage barrier if determined to be feasible. During the 10-year monitoring and evaluation period for Measure 5.4.5-3a, the SFPUC will evaluate the feasibility of installing and operating a fish passage barrier. The feasibility study will include an engineering evaluation of the existing site and diversion structure, access for construction and power supplies to the site, the application of various alternative designs, and identification of a preferred design if determined to be feasible. If it is determined that a fish passage barrier is needed to protect resident trout at the diversion structure then engineering design will be completed and be sufficiently detailed to allow permitting and completion of construction within a period of 24 months after the date that the additional mitigation is determined to be required.

Terrestrial Biological Resources

System Measures

Compensation for Impacts on Terrestrial Biological Resources

Measure 5.4.6-1: This measure mitigates for water supply and systemwide operation effects on resources within the Alameda Creek watershed. These impacts would occur primarily through operation of the Calaveras Dam Replacement project (SV-2).

The SFPUC will compensate for sensitive wetland, riparian and upland habitats and habitats which support key special-status species or other species of concern lost as a result of WSIP system operation. Similar habitat will be identified, protected, restored, enhanced, created and managed off-site[6] to ensure no net loss of habitat extent or function. A qualified biologist will quantify the magnitude and extent of impacts to wetlands, sensitive habitats, and key special-status species and other species of concern, and the SFPUC will develop and implement mitigation and compensation plans that meet the appropriate regulatory requirements and permit conditions with respect to compensation ratios, other

6 Off-site means the compensatory action is located other than within the project construction footprint, but could be on lands already under SFPUC ownership. Measure 4.6-2 addresses compensatory actions to be taken within the construction footprint.

conservation measures and management requirements to mitigate project impacts to less than significant levels.

The SFPUC will obtain required permits and comply with applicable environmental regulations addressing sensitive habitats and species. Compensatory lands—including those restored or enhanced as well as those acquired or designated as protected as part of program mitigation--will be established in perpetuity with a commitment that such lands will not be used for any purpose that conflicts with the primary purpose of maintaining intact wildlife and plant habitat.

One alternative for implementing such habitat compensation is the Habitat Reserve Program (HRP) currently being developed by the SFPUC. The purpose of the HRP is to provide a comprehensive, coordinated approach to mitigation and related regulatory compliance for WSIP projects and operations. This related SFPUC project is described further in Chapter 3.0, Section 3.12.3. Under the proposed HRP, the SFPUC would proceed as soon as possible with identifying, securing (through designation, management agreement, conservation easement, or acquisition of fee title) and improving lands to be used for habitat compensation so that mitigation is underway concurrent with habitat loss related to WSIP program activities, further ensuring no net loss of resources. The proposed HRP is scheduled for CEQA environmental review in 2007 and is targeted for implementation as soon as possible thereafter. Once the HRP is approved and implemented, the SFPUC will use this as one vehicle or method for implementing the mitigation requirements for individual WSIP projects. Otherwise, where appropriate and necessary, the SFPUC will develop and implement appropriate habitat compensation mitigation for individual WSIP projects and their associated operational impacts.

Operational Procedures for Calaveras Dam Releases

Measure 5.4.6-3: During project-level CEQA review on the Calaveras Dam Replacement project (SV-2), the SFPUC will develop operational procedures for managing planned releases from Calaveras Dam to minimize habitat impacts on amphibians, their egg masses, and tadpoles. The goal of such releases, apart from benefits to fish, is to mimic a more natural pattern of hydrology regime as much as possible. The procedures will specify the minimum amount and frequency of planned releases and the rate of the increase and decrease of any individual release event. One of the specific goals of such releases would be to reduce the risk of mortality to breeding amphibians. Such operational procedures will be developed prior to completion of construction of the Calaveras Dam Replacement project. In addition, instream flow releases required under CDFG agreement with SFPUC (see Table 5.4.1-9) would begin upon completion of construction.

Recreational and Visual Resources

System Measures

None required.

6.4.4 San Francisco Peninsula Streams and Reservoirs

Stream Flow and Reservoir Water Levels

System Measures

None identified.

Geomorphology

System Measures

None required.

Surface Water Quality

System Measures

Low-head Pumping Station at Pilarcitos Reservoir

Measure 5.5.3-2a: The SFPUC shall install a permanent low-head pumping station at Pilarcitos Reservoir which would enable the SFPUC to access and use an additional 350 acre-feet of water from Pilarcitos Reservoir. In years when the WSIP would cause releases from Pilarcitos Reservoir to Pilarcitos Creek to be reduced to reservoir inflow earlier in the summer than under the existing condition (about 25 percent of years in the hydrologic record), the SFPUC will use the pumping station to augment flow in Pilarcitos Creek with water from the reservoir. The pumping station will draw water from the cool pool of water below the thermocline during times when the reservoir is stratified. The pumping station outlet will be designed to ensure that water discharged to the creek is adequately aerated.

Aeration System at Pilarcitos Reservoir

Measure 5.5.3-2b: The SFPUC shall install a permanent aeration system at Pilarcitos Reservoir. The SFPUC will operate the aeration system as necessary to avoid anoxic conditions and maintain good water quality conditions at the reservoir.

Groundwater

System Measures

None required.

Fisheries

System Measures

Create New Spawning Habitat Above Crystal Springs Reservoir

Measure 5.5.5-1: The SFPUC will survey the extent and quality of fish spawning habitat that could potentially be lost due to inundation and, if feasible, create new spawning habitat at a higher elevations. The specifics of this mitigation measure will be determined as part of project-level CEQA review for the Lower Crystal Springs Dam Improvements project (PN-4).

Establish Flow Criteria, Monitor and Augment Flow

Measure 5.5.5-5: The SFPUC shall develop a monitoring and operations plan for Stone Dam to ensure WSIP-related flow reductions downstream of Stone Dam do not impair steelhead passage and spawning during the winter months of normal and wetter hydrologic years. This operational plan will provide for minimum stream flows to support existing adult steelhead passage and spawning downstream of Stone Dam, in the reach between Stone Dam and the confluence with the tributary at Albert Canyon, approximately 3.5 miles downstream. Downstream of Albert Canyon, WSIP flow reductions are unlikely to cause a significant impact to steelhead migration and spawning due to contributing flows from numerous downstream tributaries being sufficient to maintain adult upstream passage and spawning conditions within the creek. Monitoring and implementation of the operational plan will occur when precipitation generates runoff into Pilarcitos Creek below Stone Dam from December 1 through April 30 of normal and wetter years. This monitoring and operations plan will be established within five years of the approval of the PEIR.

Specific instream flows needed to support anadromous steelhead downstream of Stone Dam have not yet been identified. Suitable instream flows for steelhead passage on Pilarcitos Creek may be defined as providing a water depth of at least 0.6 feet over 25 percent of the total wetted channel cross-sectional area with 10 percent being contiguous. In cooperation with CDFG and NMFS, the SFPUC will identify up to five critical riffles, downstream of Stone Dam and upstream of Albert Canyon that may cause a passage impediment/barrier to steelhead migration at reduced flows as defined by the water depth criterion above. Such habitat types will be selected for survey because they represent the shallowest habitat type and thus would most likely represent low flow passage barriers under WSIP-related reduced flow scenarios. This monitoring plan will survey and document the critical riffles identified to determine physical conditions (e.g., depth, velocity, and top width of the channel) present at various flow levels. The SFPUC will measure the stage-discharge relationship at each of the five critical riffles and identify the minimum stream flow that meets the steelhead passage criterion at the most restrictive of the five riffle locations.

The SFPUC will calibrate and validate the flow measurements made at the existing flow monitoring gage (USGS Gage 11162620) located immediately downstream of Stone Dam. The SFPUC will then develop a statistical relationship between the flow measurements at the existing gage and the flow at the most restrictive critical riffle downstream of Stone Dam to establish minimum average daily flows necessary to meet steelhead passage criterion. The SFPUC will monitor average daily flows at the stream flow gage during the period from December 1 through April 30 each year. If average daily flow, as measured at the gage, indicates that the minimum stream flow at the downstream critical riffle is not met, the SFPUC will release bypass flows from Stone Dam at a rate sufficient to meet the minimum stream flow for steelhead passage at a release rate up to, but not exceeding, the average daily inflow into Pilarcitos Reservoir as determined by SFPUC operators.

The SFPUC's Natural Resources Division will complete the site-specific studies needed to determine the appropriate minimum stream flow for the most restrictive critical riffle identified during monitoring. This minimum flow criterion will be met when WSIP diversions occur between December 1 and April 30 of normal and wetter hydrologic years. The operational plan will allow for adapting minimum flow amounts to support steelhead migration based on the monitoring results and best available scientific information.

Monitoring and flow management will be continued for a minimum period of five years and a maximum period of ten years, at which time the SFPUC will prepare a technical report describing results of the stream flow monitoring, identifying whether or not operation of Stone Dam reduced passage flows below the minimum criteria, and identifying, if needed, an appropriate bypass flow for future operations at Stone Dam (a minimum flow below which water could not be diverted to storage between December and April 30). The technical report will be provided to CDFG and NMFS.

Terrestrial Biological Resources

System Measures

Habitat Monitoring and Compensation

Measure 5.5.3-2c The SFPUC shall compensate for reduced productivity and diversity of San Francisco garter snake (SFGS) and California red-legged frog (CRLF) wetland habitat which could occur as a result of greater variability, extent and duration in drawdowns at Pilarcitos Reservoir as a result of implementation of Revised Measure 5.5.3-2a (Low-head Pumping Station at Pilarcitos Reservoir). To offset the potential loss of habitat quality, the SFPUC will develop an adaptive management plan for managing and maintaining freshwater marsh and other wetlands around the periphery of Pilarcitos Reservoir. This adaptive management plan would include pre- implementation monitoring and post-implementation monitoring for up to 10 years to ensure that habitat is sustained at Pilarcitos Reservoir, to achieve no net loss of habitat and value for SFGS and CRLF habitat and document changes (if any) in extent or quality of the habitat attributable to operation of the low-head pumping station.

In the event that habitat is reduced, one alternative for implementing such habitat compensation is the Habitat Reserve Program (HRP) currently being developed by the SFPUC. The purpose of the HRP is to provide a comprehensive, coordinated approach to mitigation and related regulatory compliance for WSIP projects and operations. The HRP is described further in the PEIR, Chapter 3.0, Section 3.12.3. Under the proposed HRP, the SFPUC would proceed as soon as possible with identifying, securing (through designation, management agreement, conservation easement, or acquisition of fee title) and improving lands to be used for habitat compensation so that mitigation is underway concurrent with habitat loss related to WSIP program activities, further ensuring no net loss of resources. The proposed HRP is undergoing CEQA environmental review in 2008 and 2009 and is targeted for implementation as soon as possible thereafter. Once the HRP is approved and implemented, the SFPUC will use this as one vehicle or method for implementing the mitigation requirements for WSIP-related activities. Otherwise, where appropriate and necessary, the SFPUC will develop and implement appropriate habitat compensation mitigation for WSIP system operational effects on Pilarcitos Reservoir, independent of the HRP.

Adaptive Management of Freshwater Marsh and Wetlands at Upper and Lower Crystal Springs Reservoirs

Measure 5.5.6-1a: To offset the loss of wetlands, a qualified professional will develop an adaptive management plan for managing and maintaining freshwater marsh and other wetlands around the periphery of Upper Crystal Springs, and Lower Crystal Springs Reservoirs. This adaptive management plan may include the following:

- Gradually raise the reservoir elevations at appropriate times of year to maintain continuous freshwater marsh and riparian habitat along the shorelines to reduce potentially adverse effects to San Francisco garter snakes and California red-legged frogs.

- Identify feasible measures to help to moderate the effects of reservoir drawdown, increase the extent of reservoir margins with the potential to support freshwater

marsh vegetation, and investigate the effectiveness for the management and control of predatory aquatic species such as largemouth bass and bullfrogs.

- Perform monitoring and review to ensure that habitat is sustained at Upper and Lower Crystal Springs Reservoirs and elsewhere, as appropriate, to achieve no net loss of habitat and value for freshwater marsh, wetlands, and special-status species.

- Observe all appropriate protective measures to avoid "take" of San Francisco garter snake. In the event that the mitigation measures above cannot be followed, the SFPUC will prepare a sensitive species relocation plan, which would be approved by both the CDFG and USFWS. Such a plan would detail how underground refugia would be excavated, identify suitable relocation areas, etc.

Compensation for Impacts on Terrestrial Biological Resources

Measure 5.5.6-1b: This measure mitigates for water supply and systemwide operation effects on resources within the Peninsula watershed. These impacts would occur primarily through operation of the Upper and Lower Crystal Springs Reservoir facilitated by the Crystal Springs Dam Improvements project (PN-9).

The SFPUC will compensate for sensitive wetland, riparian and upland habitats and habitats which support key special-status species or other species of concern lost as a result of WSIP system operation. Similar habitat will be identified, protected, restored, enhanced, created and managed off-site[7] to ensure no net loss of habitat extent or function. Similarly, in the event of the loss of large, mature oaks and oak woodland, creation and/or restoration of oak woodland elsewhere will be implemented to compensate for the loss of these common upland habitats. A qualified biologist will quantify the magnitude and extent of impacts to wetlands, sensitive habitats, other upland habitats, and key special-status species and other species of concern, and the SFPUC will develop and implement mitigation and compensation plans that meet the appropriate regulatory requirements and permit

[7] Off-site means the compensatory action is located other than within the project construction footprint, but could be on lands already under SFPUC ownership. Measure 4.6-2 addresses compensatory actions to be taken within the construction footprint.

conditions with respect to compensation ratios, other conservation measures and management requirements to mitigate project impacts to less than significant levels.

The SFPUC will obtain required permits and comply with applicable environmental regulations addressing sensitive habitats and species. Compensatory lands—including those restored or enhanced as well as those acquired or designated as protected as part of program mitigation--will be established in perpetuity with a commitment that such lands will not be used for any purpose that conflicts with the primary purpose of maintaining intact wildlife and plant habitat.

One alternative for implementing such habitat compensation is a Habitat Reserve Program (HRP) currently being developed by the SFPUC. The purpose of the HRP is to provide a comprehensive, coordinated approach to mitigation and related regulatory compliance for WSIP projects and operations. This related SFPUC project is described further in Chapter 3.0, Section 3.11. Under the proposed HRP, the SFPUC would proceed as soon as possible with identifying, securing (through designation, management agreement, conservation easement, or acquisition of fee title) and improving lands to be used for habitat compensation so that mitigation is underway concurrent with habitat loss related to WSIP program activities, further ensuring no net loss of resources. The proposed HRP is scheduled for CEQA environmental review in 2007 and targeted for implementation as soon as possible thereafter. Once the HRP is approved and implemented, the SFPUC will use this as one vehicle or method for implementing the mitigation requirements for individual WSIP projects. Otherwise, where appropriate and necessary, the SFPUC will develop and implement appropriate habitat compensation mitigation for individual WSIP projects and operational effects.

Compensation for Serpentine Seep-Related Special Status Plants

Measure 5.5.6-1c: The SFPUC will develop and implement a plan to protect, create, and restore habitat for plant species adapted to serpentine seeps, particularly fountain thistle, around Upper and Lower Crystal Springs Reservoirs. The plan will also include control of pampas grass and any other invasive plant species within the serpentine seep habitat.

Recreational and Visual Resources

System Measures

None required.

6.4.5 Westside Groundwater Basin Resources

System Measures

Groundwater Monitoring to Determine Basin Safe Yield

Measure 5.6-1: The SFPUC will continue ongoing studies, including the existing groundwater and lake level monitoring programs, to determine the safe yield of the North Westside Groundwater Basin in order to avoid overdraft and associated effects including adverse effects on surface water features and seawater intrusion. Using this data, the SFPUC will develop and implement a plan identifying appropriate pumping patterns to avoid overdraft and the undesirable effects associated with overdraft. The plan will

establish both a regular (average annual) and an intermittent (dry year or emergency) yield as well as a strategy for modifying pumping patterns such that the pumping levels can be sustained as an ongoing reliable water supply without depletion of groundwater storage or degradation of water quality.

Implementation of a Lake Level Management Plan

Measure 5.6-2: The SFPUC will develop and implement a lake level management plan identifying strategies for altering pumping patterns or lake augmentation to maintain Lake Merced water levels within the desired long-term range should monitoring conducted under Measure 5.6-1 indicate the potential for adverse effects on lake levels due to groundwater pumping. The SFPUC will coordinate the implementation of this measure with Measure 5.6-1.

Drinking Water Source Assessments for Groundwater Wells

Measure 5.6-5: As required by the California Department of Health Services and incorporated as part of the WSIP, the SFPUC will prepare drinking water source assessments for groundwater wells constructed under the Local and Regional Groundwater Projects (SF-2) and will update these assessments every five years. If the assessment indicates no potential for contamination, then no mitigation is required. However, for wells that are considered vulnerable to contamination on the basis of the drinking water source assessment, the SFPUC will develop and implement a source water protection program specifying actions and a program to be implemented to prevent contamination of the drinking water source.

The source water protection program could include nonregulatory components such as watershed restoration, stormwater monitoring, groundwater monitoring, and public education to protect drinking water quality. Land use planning, permitting, and possibly more restrictive regulatory methods may also be implemented by the local municipality where a threat to drinking water quality is indicated, and management of potential sources of microbiological or direct chemical contamination to eliminate or reduce the risk of contamination of the water supply may be considered. The SFPUC will encourage public participation in the development of the program and will update the program every five years along with the drinking water source assessments.

6.4.6 Cumulative Projects and Impacts Related to WSIP Water Supply and System Operations

System Measures

None required.

6.5 Impacts of Mitigation Measures

CEQA Section 15126.4 states that "if a mitigation measure would cause one or more significant effect in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed." This section identifies which mitigation measures described in Sections 6.3 and 6.4 above may result in significant effects independent of the identified WSIP impacts, and describes the general nature of those effects. This discussion includes the following categories of mitigation measures:

- Measures that would involve designated long-term use of lands for mitigation purposes. This includes mitigation measures requiring habitat compensation through creation, restoration, and enhancement of habitat as well as permanent set-aside for farmlands
- Measures that would involve construction or operation in sensitive habitats
- Measures that would affect SFPUC regional system water supply sources, potentially reducing overall supply available for customers. This includes mitigation measures requiring increased streamflow releases from storage reservoirs, reduced diversions to storage reservoirs, or reduced groundwater pumping.
- Measures that would involve water transfers from other agencies, with potential to affect other water sources and associated resources or other water users.

Prior to implementation of these types of measures, project-level CEQA review would be conducted as necessary to identify if and what impacts would be associated with these measures in and of themselves. Even though the objective of these measures is to reduce environmental impacts, additional mitigation actions may be necessary during the construction and/or operation of these measures depending on the specific design and location. However, the mitigation measures described in this section and the associated CEQA review are not integral to the approval and adoption of the overall WSIP as a comprehensive program and policy. In some cases, CEQA review of these measures may be incorporated as part of the subsequent project-level environmental review of individual facility improvement projects, while in other cases, as described above for those measures, the measures are optional approaches to avoiding or reducing significant impacts and the SFPUC may elect to implement the alternative approach such that CEQA review would be superfluous.

6.5.1 Measures that Designate Land for Mitigation Purposes

Depending on the actual design of the measure, the following PEIR mitigation measures could be in this category: Measure 4.6-1b (Compensation for Wetlands and Other Biological Resources); Measure 4.13-2 (Siting Facilities to Avoid Prime Farmland); Measure 4.16-4a (Bioregional Habitat Restoration Measures); Measure 5.3.7-6 (Lower Tuolumne River Riparian Habitat Enhancement); Measure 5.4.6-1 (Compensation for Impacts on Terrestrial Biological Resources); Measure 5.5.6-1b (Compensation for Impacts on Terrestrial Biological Resources); and Measure 5.5.6-1c (Compensation for Serpentine Seep-Related Special Status Plants). In

general, the types of potential impacts associated with long-term designation of lands for mitigation purposes include:

- *Land use*: change existing character of the land; result in short-term disruption to nearby land uses during construction; and displace existing land uses (similar to Impacts 4.3-1 and 4.3-2, which could be mitigated through siting measures similar to Measure 4.3-2). In particular, habitat compensation could affect existing agricultural uses (similar to Impact 4.13-2, which could be mitigated through measures similar to Measure 4.13-2, avoidance of Prime Farmland)

- *Biological resources*: convert existing habitat types to other types, although habitat compensation would be expected to result in long-term benefit to biological resources; result in short-term disruption to existing biological resources during construction (similar to Impact 4.6-2, which could be mitigated through habitat protection/restoration measures similar to Measure 4.6-2, including construction timing restrictions to avoid impacts on sensitive species)

- *Geology*: change the topography or physical features of a site (which could be mitigated through standard engineering and design measures to avoid substantial changes to unique geologic or physical features)

- *Water quality and hydrology*: alter drainage patterns due to changes in grading and vegetation; result in erosion and sedimentation during construction (similar to Impacts 4.5-1 and 4.5-6, which could be mitigated through standard construction measures for erosion and sedimentation control as well as through compliance with water quality regulations)

- *Traffic, air quality, noise*: temporary construction impacts related to increased truck traffic on local streets, increased dust, and construction noise (similar to Impacts 4.8-1, 4.8-2, 4.8-3, 4.9-1, 4.9-2, 4.10-1 and 4.10-2, which could be mitigated through standard construction measures, compliance with air quality regulations, and traffic, dust and noise control measures similar to Measures 4.8-1a, 4.9-1a, 4.9-1b, 4.9-1c, 4.9-1c, 4.9-1d, 4.10-1a, 4.10-2a, and 4.10-2b)

- *Agricultural resources*: convert prime farmland to non-agricultural uses (similar to Impact 4.13-2, which could be mitigated through measures similar to Measure 4.13-2, avoidance with Prime Farmland); conflict with existing zoning for agricultural uses

As indicated above, standard mitigation approaches are available, and implementation of those measures as well as any applicable water quality or biological resource permit conditions could reduce these impacts to less than significant.

6.5.2 Measures that Involve Sensitive Habitats or Cultural Resources

Depending on the actual design of the measure, the following PEIR mitigation measures could be in this category: Measure 5.3.6-4b (Fishery Habitat Enhancement Projects); Measure 5.3.7-6 (Lower Tuolumne River Riparian Habitat Enhancement); Measure 5.4.5-3a (Minimum Flows for Resident Trout on Alameda Creek, which would requiring modifying the Alameda Creek Diversion Dam to allow bypass flows); Measure 5.4.5-3b (Alameda Diversion Dam Diversion Restrictions or Fish Screens, but only the fish passage barrier or screening option); and

Measure 5.5.5-1 (Create New Spawning Habitat Above Crystal Springs Reservoir). In general, the types of potential impacts associated with measures that involve construction or operation in sensitive habitats include:

- *Biological resources*: convert existing habitat types to other types, although habitat compensation would be expected to result in long-term benefit to biological resources; result in short-term disruption to existing biological resources during construction (similar to Impacts 4.6-1 and 4.6-2, which could be mitigated through habitat protection/restoration measures similar to Measures 4.6-1a, 4.6-1b, and 4.6-2, including construction timing restrictions to avoid impacts on sensitive species)

- *Cultural resources*: alteration of existing structures with potential historic significance such as the Alameda Creek Diversion Dam (similar to Impact 4.7-4 which could be mitigated through historic protection and documentation measures similar to Measures 4.7-4a, 4.7-4b, 4.7-4c, 4.7-4d, and 4.7-4e) or the accidental discovery of cultural resources (similar to Impacts 4.7-1 and 4.7-2, which could be mitigated through paleontological and archaeological measures similar to Measures 4.7-1, 4.7-2a, and 4.7-2b)

- *Geology*: change the topography or physical features of a site (which could be mitigated through standard engineering and design measures to avoid substantial changes to unique geologic or physical features)

- *Water quality and hydrology*: alter drainage patterns due to changes in grading and vegetation; result in erosion and sedimentation during construction; place structures within a 100-year flood hazard area (similar to Impacts 4.5-1 and 4.5-6, which could be mitigated through standard construction measures for erosion and sedimentation control and implementation of water quality and flood protection measures required under applicable permit conditions)

- *Traffic, air quality, noise*: temporary construction impacts related to increased truck traffic on local streets, increased dust, and construction noise (similar to Impacts 4.8-1, 4.8-2, 4.8-3, 4.9-1, 4.9-2, 4.10-1 and 4.10-2, which could be mitigated through standard construction measures, compliance with air quality regulations, and traffic, dust and noise control measures similar to Measures 4.8-1a, 4.9-1a, 4.9-1b, 4.9-1c, 4.9-1c, 4.9-1d, 4.10-1a, 4.10-2a, and 4.10-2b)

As indicated above, standard mitigation approaches are available, and implementation of those measures as well as any applicable water quality or biological resource permit conditions could reduce these impacts to less than significant.

6.5.3 Measures that Affect SFPUC Supply Sources

The following PEIR mitigation measures would be in this category: Measure 5.4.5-3a (Minimum Flows for Resident Trout on Alameda Creek); Measure 5.4.6-3 (Operational Procedures for Calaveras Dam Releases); Measure 5.5.3-2 (Revised Operations Plan for Pilarcitos Watershed Facilities); Measure 5.6-1 (Groundwater Monitoring to Determine Basin Safe Yield); and Measure 5.6-2 (Implementation of Lake Level Management Plan). These measures could have the effect of reducing available local water supply sources needed to meet customer demands and to achieve WSIP goals, objectives, and levels of service. Measures 5.4.5-3a and 5.4.6-3 could reduce storage in Calaveras Reservoir; Measure 5.5.3-2 would limit use of Pilarcitos watershed

supplies to current levels and, in turn, may require additional supply from other regional system sources; and Measure 5.6-1 could result in reduced levels of groundwater pumping from the North Westside Groundwater Basin. Depending on the magnitude of these measures, the SFPUC may need to increase use of other water supply sources in order to serve the 300 mgd average annual customer purchase requests in 2030 and to meet the water supply level of service performance objectives of the WSIP.

One possibility could be increased use of water supplies from Hetch Hetchy Reservoir, resulting in potential impacts on the Tuolumne River similar to those discussed in Chapter 5 and Chapter 8 (under Variant 1, All Tuolumne). Other possible alternative water sources and their potential impacts are discussed in Chapters 8 and 9. These include potable water from desalination, increased levels of conservation and water recycling, or other water sources. However, at this time, the timing as well as the magnitude of the potential effects of these measures are unknown, and the actual impact on other SFPUC supply sources could be less than significant if the change is within the typical inter-annual variation of SFPUC customer water deliveries. Other intervening factors, such as results of groundwater monitoring under Measure 5.6-1 or the planned Habitat Conservation Plan for fish in Alameda Creek, could reduce the estimated severity of the potential impacts and obviate or override the need for these measures.

6.5.4 Measures that Affect Other Water Sources

The following PEIR mitigation measure would be in this category: Measure 5.3.6-4a (Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water). At this time, it is unknown what sources of water or water users could be affected by a water transfer arrangement with TID, MID, or other agency or agencies that involves use only of conserved water. Supplemental water could be made available as a result of:

- Water use efficiency and conservation for agricultural, residential and commercial users
- Land use changes, either agricultural to urban, or more water intensive (e.g., pasture) to less intensive (e.g., orchard)
- Conjunctive use of groundwater
- Recycled water
- Tiered water pricing
- Land fallowing of agricultural lands.

In general, the types of potential environmental impacts associated with water transfers from these types of sources include:

- *Land use*: reduced agricultural activity (similar or related to Impact 4.3-2 which could be mitigated through siting measures similar to Measure 4.3-2)
- *Biological resources*: indirect effects on aquatic and/or terrestrial biological resources due to possible reductions in irrigation/drainage system return flows, reductions in discharges

of treated wastewater, changes in land use from more water intensive uses to less water intensive uses, or lowered groundwater tables (similar to Impacts 4.6-1, 4.6-2, 4.6-3, and 4.6-4 which could be mitigated through habitat protection/restoration measures similar to Measures 4.6-1a, 4.6-1b, 4.6-2, 4.6-3a, 4.6-3b, and 4.6-4)

- *Water quality and hydrology*: reduced groundwater recharge due to agricultural water conservation practices such as lining irrigation canals or conversion to drip irrigation, or land use changes (similar to Impact 4.5-2 which could be mitigated through groundwater protection measures similar to Measure 4.5-2)

- *Agricultural resources*: reduced agricultural activity due to farming; potential conversion of idle agricultural land to other uses (similar to Impact 4.13-2, which could be mitigated through measures similar to Measure 4.13-2, avoidance of Prime Farmland)

- *Noise*: increased noise from use of pumps for conjunctive-use groundwater program (similar to Impact 4.10-4, which could be mitigated through standard construction measures for noise controls)

- *Energy*: increased use of energy for conjunctive-use groundwater or recycled water programs (similar to Impact 4.15-2 for the Groundwater Projects, SF-2) and Recycled Water Projects, SF-3, which could be mitigated through energy efficiency measures similar to Measure 4.15-2)

- *Air Quality*: increased particulate emissions from on-farm efficiency measures like land leveling (which could be mitigated through standard dust control measures similar to those listed in Measure 4.9-1a)

As indicated above, standard mitigation approaches are available, and implementation of those measures as well as any applicable water quality or biological resource permit conditions could reduce these impacts to less than significant.

6.6 Summary Tables of All Impacts and Mitigation Measures

TABLE 6.3
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
4.3 Land Use and Visual Quality					
Impact 4.3-1: Temporary disruption or displacement of existing land uses during construction	LS	LS	PSM	PSM	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	N/A	N/A	X	X	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	N/A	X	X	N/A
No. 5: Traffic	N/A	N/A	X	X	N/A
No. 6: Noise	N/A	N/A	X	X	N/A
No. 10: Project Site	N/A	N/A	X	X	N/A
PEIR Mitigation Measures					
Traffic, Transportation, and Circulation Measures (4.8-1a and 4.8-1b); Air Quality Measures (4.9-1a thru 4.9-1d, 4.9-2a and 4.9-2b); Noise Measures (4.10-1a, 4.10-1b, 4.10-2a thru 4.10-2c, 4.10-3a thru 4.10-3c); and Recreational Resources Measure (4.12-1)	N/A	N/A	X	X	N/A
Impact 4.3-2: Permanent displacement or long-term disruption of existing land uses	LS	N/A	PSU	N/A	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-2: Facility Siting Studies	N/A	N/A	X	N/A	N/A
Impact 4.3-3: Temporary construction impacts on scenic vistas or visual character	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
None required.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Impact 4.3-4: Permanent adverse impacts on scenic vistas or visual character	PSM	LS	LS	N/A	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-4a: Architectural Design	X	N/A	N/A	N/A	X
4.3-4b: Landscaping Plans	X	N/A	N/A	N/A	X
4.3-4c: Landscape Screens	X	N/A	N/A	N/A	X
4.3-4d: Minimize Tree Removal	X	N/A	N/A	N/A	X
Impact 4.3-5: New permanent sources of light glare	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-5: Reduce Lighting Effects	X	X	X	X	X
4.4 Geology, Soils, and Seismicity					
Impact 4.4-1: Slope instability during construction	LS	PSM	N/A	N/A	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	N/A	N/A	X
PEIR Mitigation Measures					
4.4-1: Quantified Landslide Analysis	N/A	X	N/A	N/A	N/A
Impact 4.4-2: Erosion during construction	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
PEIR Mitigation Measures					
None required.					
Impact 4.4-3: Substantial alteration of topography	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-4: Squeezing ground and subsidence during tunneling	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.4-4: Subsidence Monitoring Program	N/A	N/A	N/A	N/A	N/A
Impact 4.4-5: Surface fault rupture	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required					
Impact 4.4-6: Seismically induced groundshaking	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Impact 4.4-7: Seismically induced ground failure, including liquefaction and settlement	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-8: Seismically induced landslides or other slope failures	LS	LS	N/A	N/A	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	N/A	N/A	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	N/A	N/A	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-9: Expansive or corrosive soils	PSM	PSM	PSM	PSM	PSM
Regulations					
California Building Code	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
4.4-9: Characterize Extent of Expansive and Corrosive Soil	X	X	X	X	X
4.5 Surface Water Hydrology and Water Quality					
Impact 4.5-1: Degradation of water bodies as a result of erosion and sedimentation or a hazardous materials release during construction	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
Encroachment permitting requirements	N/A	N/A	X	N/A	N/A
SFPUC Construction Measures					
No. 3: On-Site Air and Water Quality Measures During Construction	X	X	X	X	X

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
PEIR Mitigation Measures					
None required.					
Impact 4.5-2: Depletion of groundwater resources	LS	N/A	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-2: Site-Specific Groundwater Analysis and Identified Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.5-3a: Degradation of water quality due to construction dewatering discharges	LS	N/A	LS	LS	LS
Regulations					
NPDES discharge requirements	X	N/A	X	X	X
Waste Discharge Requirements	X	N/A	X	X	X
SFPUC Construction Measures					
No. 4: Groundwater	X	N/A	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.5-3b: Degradation of water quality due to construction-related discharges of treated water	LS	LS	LS	LS	LS
Regulations					
NPDES discharge requirements	X	X	X	X	X
Waste Discharge Requirements	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.5-4: Flooding and water quality impacts associated with impeding or redirecting flood flows	N/A	N/A	PSM	PSM	N/A
Regulations					
None applicable.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-4a: Flood Flow Protection Measures	N/A	N/A	X	X	N/A
4.5-4b: Site-Specific Flooding Analysis and Identified Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.5-5: Degradation of water quality and increased flows due to discharges to surface water during operation	N/A	N/A	LS	N/A	N/A
Regulations					
NDPES discharge requirements	N/A	N/A	X	N/A	N/A
Waste Discharge Requirements	N/A	N/A	X	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-5: Stormwater Treatment and Groundwater Monitoring	N/A	N/A	N/A	N/A	N/A
Impact 4.5-6: Degradation of water quality as a result of alteration of drainage patterns or an increase in impervious surfaces	LS	PSM	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
4.5-6: Appropriate Source Controls and Site Design Measures	N/A	X	N/A	N/A	N/A
4.6 Biological Resources					
Impact 4.6-1: Impacts on wetlands and aquatic resources	PSM	PSM	PSM	PSM	PSM
Regulations					
Clean Water Act - Section 404	X	X	X	X	X
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-1a: Wetlands Assessment	X	X	X	X	X
4.6-1b: Compensation for Wetlands and Other Biological Resources	X	X	X	X	X

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Impact 4.6-2: Impact to sensitive habitats, common habitats, and heritage trees	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-2: Habitat Restoration/Tree Replacement	X	X	X	X	X
Biological Resources Measure 4.6-1b	X	X	X	X	X
Impact 4.6-3: Impact on key special-status species – direct mortality and/or habitat effects	PSM	PSM	PSM	PSM	PSM
Regulations					
Federal Endangered Species Act	X	X	X	X	X
California Endangered Species Act	X	X	X	X	X
California Native Plant Protection Act	X	X	X	X	X
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-3a: Protection Measures During Construction for Key Special-Status Species and Other Species of Concern	X	X	X	X	X
4.6-3b: Standard Mitigation Measures for Key Special Status Plants and Animals	X	X	X	X	X
Biological Resources Measure 4.6-1b	X	X	X	X	X
Impact 4.6-4: Water discharge effects on riparian and/or aquatic resources	LS	LS	PSM	PSM	LS
Regulations					
Waste Discharge Requirements	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.6-4 Pipeline and Water Treatment Plant Treated Water Discharge Restrictions	N/A	N/A	X	X	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Impact 4.6-5: Conflict with adopted conservation plans or other approved biological resources plans	N/A	N/A	PSM	PSM	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
Biological Resources Measures 4.6-1a, 4.6-1b, 4.6-2, 4.6-3a, and 4.6-3b	N/A	N/A	X	X	N/A
4.7 Cultural Resources					
Impact 4.7-1: Impacts on paleontological resources	PSM	LS	PSM	PSM	PSM
Regulations					
Paleontological Resources Preservation Act	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.7-1: Suspend Construction Work if Paleontological Resource is Identified	X	N/A	X	X	X
Impact 4.7-2: Impacts on archaeological resources	PSM	PSM	PSM	PSM	PSM
Regulations					
California Health and Safety Code	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.7-2a: Archaeological Testing, Monitoring, and Treatment of Human Remains	X	X	X	X	X
4.7-2b: Accidental Discovery Measures	X	X	X	X	X
Impact 4.7-3: Impacts on historical significance of a historic district or a contributor to a historic district	PSM	N/A	PSM	PSM	N/A
Regulations					
National Historic Preservation Act	X	N/A	X	X	N/A
SFPUC Construction Measures					
None applicable.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
PEIR Mitigation Measures					
4.7-3: Protection of Historic Districts	X	N/A	X	X	N/A
Cultural Resources Measures 4.7-4a thru 4.7-4f	X	N/A	X	X	N/A
Impact 4.7-4: Impacts on the historical significance of individual facilities resulting from demolition or alteration	PSM	N/A	PSM	PSM	N/A
Regulations					
National Historic Preservation Act	X	N/A	X	X	N/A
SFPUC Construction Measures					
No. 9: Cultural Resources	X	N/A	X	X	N/A
PEIR Mitigation Measures					
4.7-4a: Alternatives Identification and Resource Relocation	X	N/A	X	X	N/A
4.7-4b: Historical Resources Documentation	X	N/A	X	X	N/A
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	N/A	X	X	N/A
4.7-4d: Historic Resources Survey and Redesign	X	N/A	X	X	N/A
4.7-4e: Historic Resources Protection Plan	X	N/A	X	X	N/A
4.7-4f: Pre-construction Surveys and Vibration Monitoring	X	N/A	X	X	N/A
Impact 4.7-5: Impacts on adjacent historic architectural resources	LS	LS	PSM	PSM	PSM
Regulations					
National Historic Preservation Act	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
Cultural Resources Measures 4.7-4a thru 4.7-4f	N/A	N/A	X	X	X
4.8 Traffic, Transportation, and Circulation					
Impact 4.8-1: Temporary reduction in roadway capacity and increased traffic delays	LS	LS	PSM	PSM	LS
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
4.8-1a: Traffic Control Plan Measures	N/A	N/A	X	X	N/A
4.8-1b: Coordination of Individual Traffic Control Plans	N/A	N/A	N/A	N/A	N/A
Impact 4.8-2: Short-term traffic increases on roadways	PSM	PSM	PSM	PSM	PSM
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
Traffic, Trasportation, and Circulation Measure 4.8-1a	X	X	X	X	X
Traffic, Transportation, and Circulation Measure 4.8-1b	N/A	N/A	X	X	N/A
Impact 4.8-3: Impaired access to adjacent roadways and land uses	LS	LS	PSM	PSM	LS
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
Traffic, Transportation, and Circulation Measure 4.8-1a	N/A	N/A	X	X	N/A
Impact 4.8-4: Temporary displacement of on-street parking	LS	LS	LS	PSM	LS
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
4.8-4: Accommodation of Displaced Public Parking Supply for Recreational Visitors	N/A	N/A	N/A	N/A	N/A
Traffic, Trasportation, and Circulation Measure 4.8-1a	N/A	N/A	N/A	X	N/A
Impact 4.8-5: Increased traffic safety hazards during construction	PSM	PSM	PSM	PSM	PSM
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
PEIR Mitigation Measures					
Traffic, Trasportation, and Circulation Measure 4.8-1a	X	X	X	X	X
Impact 4.8-6: Long-term traffic increases during facility operation	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
4.9 Air Quality					
Impact 4.9-1: Construction emissions of criteria pollutants	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X
PEIR Mitigation Measures					
4.9-1a: SJVAPCD Dust Control Measures	X	X	X	X	X
4.9-1b: SJVAPCD Exhaust Control Measures	X	X	X	X	X
4.9-1c: BAAQMD Dust Control Measures	N/A	N/A	N/A	N/A	N/A
4.9-1d: BAAQMD Exhaust Control Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.9-2: Exposure to diesel particulate matter during construction	LS	N/A	LS	LS	LS
Regulations					
California Health and Safety Code, Section 2485 – reduces emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles	X	N/A	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.9-2a: Health Risk Screening or Use of Soot Filters	N/A	N/A	N/A	N/A	N/A
4.9-2b: Vacate SFPUC Land Managers' Residences in Sunol Valley	N/A	N/A	N/A	N/A	N/A
Impact 4.9-3: Exposure to emissions (possibly including asbestos) from tunneling	N/A	N/A	PSM	PSM	N/A
Regulations					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
OSHA standards for worker safety during tunneling	N/A	N/A	X	X	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.9-3: Tunnel gas odor control	N/A	N/A	X	X	N/A
Impact 4.9-4: Air pollutant emissions during project operation	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.9-5: Odors generated during project operation	LS	LS	N/A	N/A	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.9-6: Secondary emissions at power plants	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.9-7: Conflict with implementation of applicable regional air quality plans addressing criteria air pollutants and state goals for reducing GHG emissions.	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
4.10 Noise and Vibration					
Impact 4.10-1: Disturbance from temporary construction-related noise increases	PSU	PSU	PSU	PSU	PSU
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 6: Noise	X	N/A	X	X	X
PEIR Mitigation Measures					
4.10-1a: Noise Controls	X	N/A	X	X	X
4.10-1b: Vacate SFPUC Caretaker's Residence at Tesla Portal	X	N/A	N/A	N/A	X
Impact 4.10-2: Temporary noise disturbance along construction haul routes	PSU	N/A	PSU	PSU	PSU
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.10-2a: Limit Hourly Truck Volumes	X	N/A	X	X	X
4.10-2b: Restrict Truck Operations	X	N/A	X	X	X
4.10-2c: Vacate SFPUC Land Manager's Residence	N/A	N/A	N/A	N/A	N/A
Impact 4.10-3: Disturbance due to construction-related vibration	LS	LS	PSU	PSU	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.10-3a: Vibration Controls to Prevent Cosmetic or Structural Damage	N/A	N/A	X	X	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
4.10-3b: Limit Vibration Levels at or Below Vibration Perception Threshold	N/A	N/A	X	X	N/A
4.10-3c: Limit Tunnel-Related Detonation to Daylight Hours	N/A	N/A	N/A	N/A	N/A
Impact 4.10-4: Disturbance due to long-term noise increases	LS	LS	LS	N/A	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 6: Noise	X	N/A	X	N/A	X
PEIR Mitigation Measures					
None required.					
4.11 Public Services and Utilities					
Impact 4.11-1: Potential temporary damage to or disruption of existing regional or local public utilities	LS	LS	PSM	LS	LS
Regulations					
OSHA Construction Safety Orders	X	X	X	X	X
DHS separation standards	X	X	X	X	X
SFPUC Construction Measures					
No. 1: Neighborhood Notice	X	X	X	X	X
PEIR Mitigation Measures					
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	N/A	N/A	X	N/A	N/A
4.11-1b: Locate Utility Lines Prior to Excavation	N/A	N/A	X	N/A	N/A
4.11-1c: Confirmation of Utility Line Information	N/A	N/A	X	N/A	N/A
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	N/A	N/A	X	N/A	N/A
4.11-1e: Notify Local Fire Departments	N/A	N/A	X	N/A	N/A
4.11-1f: Emergency Response Plan	N/A	N/A	X	N/A	N/A
4.11-1g: Prompt Reconnection of Utilities	N/A	N/A	X	N/A	N/A
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	N/A	N/A	X	N/A	N/A
Impact 4.11-2: Temporary adverse effects on solid waste landfill capacity	PSM	PSM	PSM	PSM	PSM
Regulations					
California Integrated Waste Management Act of 1989	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
PEIR Mitigation Measures					
4.11-2: Waste Reduction Measures	X	X	X	X	X
Impact 4.11-3: Impacts related to compliance with statutes and regulations related to solid waste	PSM	PSM	PSM	PSM	PSM
Regulations					
California Integrated Waste Management Act of 1989	X	X	X	X	X
SFPUC Construction Measures					
None applicable.	X	X	X	X	X
PEIR Mitigation Measures					
Public Services and Utilities Measure 4.11-2	X	X	X	X	X
Impact 4.11-4: Impacts related to the relocation of utilities	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	X	X	X	X	X
PEIR Mitigation Measures					
Public Services and Utilities Measures 4.11-1a thru 4.11-1h	X	X	X	X	X
4.12 Recreational Resources					
Impact 4.12-1: Temporary conflicts with established recreational uses during construction	N/A	N/A	PSM	PSM	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	N/A	N/A	X	X	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	N/A	X	X	N/A
No. 5: Traffic	N/A	N/A	X	X	N/A
No. 6: Noise	N/A	N/A	X	X	N/A
No. 10: Project Site	N/A	N/A	X	X	N/A
PEIR Mitigation Measures					
4.12-1: Coordination with Golf Course/Recreational Facility Managers	N/A	N/A	X	X	N/A
Traffic, Transportation, and Circulation Measures (4.8-1a and 4.8-1b); Air Quality Measures (4.9-1a, 4.9-1b, 4.9-2a, 4.9-2b); and Noise Measures (4.10-1a, 4.10-1b, 4.10-2a thru 4.10-2c, and 4.10-3a thru 4.10-3b)	N/A	N/A	X	X	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Impact 4.12-2: Conflicts with established recreational uses due to facility siting and project operation	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.12-2: Appropriate Siting of Proposed Facilities	N/A	N/A	N/A	N/A	N/A
4.13 Agricultural Resources					
Impact 4.13-1: Temporary conflicts with established agricultural resources	N/A	N/A	PSM	PSM	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	N/A	N/A	X	X	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	N/A	X	X	N/A
No. 5: Traffic	N/A	N/A	X	X	N/A
No. 6: Noise	N/A	N/A	X	X	N/A
PEIR Mitigation Measures					
4.13-1a: Supplemental Noticing and Soil Stockpiling	N/A	N/A	X	X	N/A
4.13-1b: Avoidance or Soil Stockpiling	N/A	N/A	N/A	N/A	N/A
Traffic, Transportation, and Circulation Measures (4.8-1a and 4.8-1b); Air Quality Measures (4.9-1a thru 4.9-1d, and 4.9-2a and 4.9-2b); and Noise Measures (4.10-1a, 4.10-b, 4.10-2a thru 4.10-2c, and 4.10-3a thru 4.10-3c)	N/A	N/A	X	X	N/A
Impact 4.13-2: Conversion of farmlands to non-agricultural uses	N/A	N/A	PSM	N/A	N/A
Regulations					
California Land Conservation Act of 1965 (Williamson Act)	N/A	N/A	X	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.13-2: Siting Facilities to Avoid Prime Farmland	N/A	N/A	X	N/A	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
4.14 Hazards					
Impact 4.14-1: Potential to encounter hazardous materials in soil and groundwater	LS	LS	LS	PSM	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 4: Groundwater	X	N/A	X	X	X
No. 7: Hazardous Materials	X	X	X	X	X
PEIR Mitigation Measures					
4.14-1a: Site Health and Safety Plan	N/A	N/A	N/A	X	N/A
4.14-1b: Materials Disposal Plan	N/A	N/A	N/A	X	N/A
4.14-1c: Coordination with Property Owners and Regulatory Agencies	N/A	N/A	N/A	X	N/A
Impact 4.14-2: Exposure to naturally occurring asbestos	N/A	N/A	N/A	N/A	N/A
Regulations					
Asbestos Airborne Toxic Control Measure					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.14-2: Health Risk Screening and Airborne Asbestos Monitoring Plan	N/A	N/A	N/A	N/A	N/A
Impact 4.14-3: Risk of fires during construction	LS	LS	LS	LS	LS
Regulations					
Public Resources Code fire safety regulations	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-4: Gassy conditions in tunnels	N/A	N/A	LS	LS	N/A
Regulations					
Tunnel Safety Orders	N/A	N/A	X	X	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-5: Exposure to hazardous building materials	N/A	N/A	PSM	PSM	PSM
Regulations					
California Code of Regulations, Title 8 – asbestos abatement	N/A	N/A	X	X	X
California Code of Regulations Title 17 – lead-based paint regulations	N/A	N/A	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.14-5: Hazardous Building Materials Surveys and Abatement	N/A	N/A	X	X	X
Impact 4.14-6: Accidental hazardous materials release from construction equipment	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 3: On-site Air and Water Quality Measures During Construction	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.14-7: Increased use of hazardous materials during operation	LS	LS	LS	N/A	LS
Regulations					
Risk Management regulations (HMBP)	X	X	X	N/A	X
Risk Management regulations (RMP)	N/A	N/A	N/A	N/A	N/A
Aboveground storage tank regulations	X	X	X	N/A	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-8: Emission or use of hazardous materials within ¼ mile of a school	N/A	N/A	N/A	N/A	N/A

TABLE 6.3 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN JOAQUIN REGION PROJECTS (SJ-1 through SJ-5)

IMPACT	Advanced Disinfection SJ-1	Lawrence Livermore Supply Improvements SJ-2	San Joaquin Pipeline System SJ-3	Rehabilitation of Existing San Joaquin Pipelines SJ-4	Tesla Portal Disinfection Station SJ-5
Regulations					
Risk Management regulations (HMBP)	N/A	N/A	N/A	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
4.15 Energy					
Impact 4.15-1: Construction-related energy use	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
Air Quality Measures 4.9-1b and 4.9-1d	X	X	X	X	X
Impact 4.15-2: Long-term energy use during operation	PSM	PSM	PSM	LS	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.15-2: Incorporation of Energy Efficiency Measures	X	X	X	N/A	X

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.4
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
4.3 Land Use and Visual Quality						
Impact 4.3-1: Temporary disruption or displacement of existing land uses during construction	LS	LS	LS	PSU	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 1: Neighborhood Notice	N/A	N/A	N/A	X	N/A	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	N/A	N/A	X	N/A	N/A
No. 5: Traffic	N/A	N/A	N/A	X	N/A	N/A
No. 6: Noise	N/A	N/A	N/A	X	N/A	N/A
No. 10: Project Site	N/A	N/A	N/A	X	N/A	N/A
PEIR Mitigation Measures						
See Traffic Measure (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), Noise Measures (4.10-1 through 4.10-3).	N/A	N/A	N/A	X	N/A	N/A
Impact 4.3-2: Permanent displacement or long-term disruption of existing land uses	N/A	N/A	PSU	LS	N/A	PSU
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.3-2: Facility Siting Studies	N/A	N/A	X	N/A	N/A	X
Impact 4.3-3: Temporary construction impacts on scenic vistas or visual character	LS	LS	LS	LS	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 10: Project Site	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.3-4: Permanent adverse impacts on scenic vistas or visual character	PSM	PSU	LS	PSM	LS	PSM
Regulations						
Watershed Management Plans and Actions						
Des5: Design Guidelines	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.3-4a: Architectural Design	X	X	N/A	X	N/A	X
4.3-4b: Landscaping Plans	X	X	N/A	X	N/A	X
4.3-4c: Landscape Screens	X	X	N/A	X	N/A	X
4.3-4d: Minimize Tree Removal	X	X	N/A	X	N/A	X
Impact 4.3-5: New permanent sources of light glare	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.3-5: Reduce Lighting Effects	X	X	X	X	X	X
4.4 Geology, Soils, and Seismicity						
Impact 4.4-1: Slope instability during construction	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
Watershed Management Plan Policies and Actions:						
No. S5: avoid landslides and slopes greater than 30%	X	X	X	X	X	X
No. S6: conduct inspections	X	X	X	X	X	X
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
4.4-1: Quantified Landslide Analysis	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.4-2: Erosion during construction	LS	LS	LS	LS	LS	LS
Regulations						
NPDES stormwater requirements	X	X	X	X	X	X
SFPUC Construction Measures						
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.4-3: Substantial alteration of topography	LS	LS	LS	LS	LS	LS
Regulations						
Watershed Management Plan Policies and Actions:						
No. des5: follow design guidelines	N/A	X	N/A	N/A	N/A	N/A
SFPUC Construction Measures						
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	X	N/A	X	N/A	N/A
No. 10: Project Site	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.4-4: Squeezing ground and subsidence during tunneling	N/A	N/A	N/A	PSM	N/A	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.4-4: Subsidence Monitoring Program	N/A	N/A	N/A	X	N/A	N/A
Impact 4.4-5: Surface fault rupture	LS	LS	LS	LS	LS	LS
Regulations						
SFPUC General Seismic Design Requirements	X	X	X	X	X	X
Watershed Management Plan Policies and Actions:						
No. S4: avoid active fault zones and traces	X	X	X	X	X	X
No. S6: conduct inspections	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.4-6: Seismically induced groundshaking	LS	LS	LS	LS	LS	LS
Regulations						
SFPUC General Seismic Design Requirements	X	X	X	X	X	X
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.4-7: Seismically induced ground failure, including liquefaction and settlement	LS	LS	LS	LS	LS	LS
Regulations						
SFPUC General Seismic Design Requirements	X	X	X	X	X	X
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.4-8: Seismically induced landslides or other slope failures	LS	LS	LS	LS	LS	LS
Regulations						
SFPUC General Seismic Design Requirements	X	X	X	X	X	X
Watershed Management Plan Policies and Actions:						
No. S5: avoid landslides and slopes greater than 30%	X	X	X	X	X	X
No. S6: conduct inspections	X	X	X	X	X	X
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.4-9: Expansive or corrosive soils	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
California Building Code	X	X	X	X	X	X
SFPUC Construction Measures						
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X	X
PEIR Mitigation Measures						
4.4-9: Characterize Extent of Expansive and Corrosive Soil	X	X	X	X	X	X
4.5 Surface Water Hydrology and Water Quality						
Impact 4.5-1: Degradation of water bodies as a result of erosion and sedimentation or a hazardous materials release during construction	LS	LS	LS	LS	LS	LS
Regulations						
NPDES stormwater requirements	X	X	X	X	X	X
Encroachment permitting requirements	X	N/A	X	N/A	N/A	X
Watershed Management Plans and Actions:						
Aqu1: locate outside of high water quality vulnerability zone if possible	X	X	X	X	X	X
Aqu5: rehabilitate shoreline area	X	X	X	N/A	N/A	X
Veg4: grading plan	X	X	X	X	X	X
Veg7: follow erosion control BMPs	X	X	X	X	X	X
Veg13: minimize disturbance of serpentine bedrock	N/A	X	N/A	N/A	N/A	N/A
SFPUC Construction Measures						
No. 3: On-site Air and Water Quality Measures During Construction	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.5-2: Depletion of groundwater resources	LS	LS	N/A	PSM	N/A	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.5-2: Site-Specific Groundwater Analysis and Identified Measures	N/A	N/A	N/A	X	N/A	N/A

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.5-3a: Degradation of water quality due to construction dewatering discharges	LS	LS	N/A	LS	N/A	LS
Regulations						
NPDES discharge requirements	X	X	N/A	X	N/A	X
SFPUC Construction Measures						
No.4: Groundwater	X	X	N/A	X	N/A	X
PEIR Mitigation Measures						
None required.						
Impact 4.5-3b: Degradation of water quality due to construction-related discharges of treated water	N/A	N/A	LS	LS	LS	LS
Regulations						
NPDES discharge requirements	N/A	N/A	X	X	X	X
Watershed Management Plans and Actions:						
Fis6: dechlorinate water before discharge	N/A	N/A	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.5-4: Flooding and water quality impacts associated with impeding or redirected flood flows.	PSM	N/A	N/A	PSM	N/A	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.5-4a: Flood Flow Protection Measures	X	N/A	N/A	X	N/A	X
4.5-4b: Site Specific Flooding Analysis and Identified Measures	X	N/A	N/A	X	N/A	N/A
Impact 4.5-5: Degradation of water quality and increased flows due to discharges to surface water during operation	N/A	N/A	LS	N/A	LS	LS
Regulations						
NPDES discharge requirements	N/A	N/A	X	N/A	X	X
Watershed Management Plans and Actions:						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Fis6: dechlorinate water before discharge	N/A	N/A	X	N/A	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.5-5: Stormwater Treatment and Groundwater Monitoring	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.5-6: Degradation of water quality as a result of alteration of drainage patterns or an increase in impervious surfaces	LS	LS	LS	LS	LS	LS
Regulations						
NPDES stormwater requirements	X	X	X	X	X	X
Watershed Management Plans and Actions:						
Sto1: stormwater drainage and collection	X	X	X	X	X	N/A
SFPUC Construction Measures						
No. 10: Project Site	X	X	X	X	X	X
PEIR Mitigation Measures						
4.5-6: Appropriate Source Control and Site Design Measures	N/A	N/A	N/A	N/A	N/A	N/A
4.6 Biological Resources						
Impact 4.6-1: Impacts on wetlands and aquatic resources	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
Clean Water Act – Section 404	X	X	X	X	X	X
SFPUC Construction Measures						
No. 8: Biological Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
4.6-1a: Wetlands Assessment	X	X	X	X	X	X
4.6-1b: Compensation for Wetlands and Other Biological Resources	X	X	X	X	X	X
Impact 4.6-2: Impact to sensitive habitats, common habitats, and heritage trees	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 8: Biological Resources	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
PEIR Mitigation Measures						
4.6-2: Habitat Restoration/Tree Replacement	X	X	X	X	X	X
See Biological Resources Measure 4.6-1b.	X	X	X	X	X	X
Impact 4.6-3: Impact on key special-status species – direct mortality and/or habitat effects	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
Federal Endangered Species Act	X	X	X	X	X	X
California Endangered Species Act	X	X	X	X	X	X
California Native Plant Protection Act	X	X	X	X	X	X
SFPUC Construction Measures						
No. 8: Biological Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
4.6-3a: Protection Measures During Construction for Key Special-Status Species and Other Species of Concern	X	X	X	X	X	X
4.6-3b: Standard Mitigation Measures for Specific Plants and Animals	X	X	X	X	X	X
See Biological Resources Measure 4.6-1b.	X	X	X	X	X	X
Impact 4.6-4: Water discharge effects on riparian and/or aquatic resources	LS	LS	LS	PSM	LS	LS
Regulations						
Waste Discharge Requirements	N/A	N/A	X	X	X	X
Watershed Management Plans and Actions:						
Fis 6: Identify and adopt alternative nontoxic management practices for the protection of aquatic resources	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.6-4: Pipeline and Water Treatment Plant Water Discharge Restoration	N/A	N/A	N/A	X	N/A	N/A
Impact 4.6-5: Conflict with adopted conservation plans or other approved biological resources plans	LS	LS	LS	LS	LS	LS
Regulations						
None applicable.						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
SFPUC Construction Measures						
No. 8 Biological Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
See Biological Resources Measures 4.6-1a, 4.6-1b, 4.6-2, and 4.6-3a, 4.6-3b	X	X	X	X	X	X
4.7 Cultural Resources						
Impact 4.7-1: Impacts on paleontological resources	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
Paleontological Resources Preservation Act	X	X	X	X	X	X
SFPUC Construction Measures						
No. 9: Cultural Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
4.7-1: Suspend Construction Work if Paleontological Resource is Identified	X	X	X	X	X	X
Impact 4.7-2: Impacts on archaeological resources	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
California Health and Safety Code	X	X	X	X	X	X
SFPUC Construction Measures						
No. 9: Cultural Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
4.7-2a: Archaeological Testing, Monitoring, and Treatment of Human Remains	X	X	X	X	X	X
4.7-2b: Accidental Discovery Measures	X	X	X	X	X	X
Impact 4.7-3: Impacts on historical significance of a historic district or a contributor to a historic district	N/A	PSU	N/A	PSM	N/A	PSM
Regulations						
National Historic Preservation Act	N/A	X	N/A	X	N/A	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.7-3: Protection of Historic Districts	N/A	X	N/A	X	N/A	X
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	N/A	X
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	N/A	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	N/A	X
4.7-4d: Historic Resources Survey and Redesign	N/A	X	N/A	X	N/A	X
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	N/A	X
4.7-4f: Pre-construction Surveys and Vibration Monitoring	N/A	X	N/A	X	N/A	X
Impact 4.7-4: Impacts on the historical significance of individual facilities resulting from demolition or alteration	N/A	PSU	N/A	PSU	N/A	PSM
Regulations						
National Historic Preservation Act	N/A	X	N/A	X	N/A	X
SFPUC Construction Measures						
No. 9: Cultural Resources	N/A	X	N/A	X	N/A	X
PEIR Mitigation Measures						
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	N/A	X
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	N/A	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	N/A	X
4.7-4d: Historic Resources Survey and Redesign	N/A	X	N/A	X	N/A	X
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	N/A	X
4.7-4f: Pre-construction Surveys and Vibration Monitoring	N/A	X	N/A	X	N/A	X
Impact 4.7-5: Impacts on adjacent historic architectural resources	LS	PSM	LS	PSM	LS	PSM
Regulations						
National Historic Preservation Act	X	X	X	X	X	X
SFPUC Construction Measures						
No. 9: Cultural Resources	X	X	X	X	X	X
PEIR Mitigation Measures						
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	N/A	X
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	N/A	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	N/A	X
4.7-4d: Historical Resources Survey and Redesign	N/A	X	N/A	X	N/A	X
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	N/A	X
4.7-4f: Preconstruction Surveys and Vibration Monitoring	N/A	X	N/A	X	N/A	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
4.8 Traffic, Transportation, and Circulation						
Impact 4.8-1: Temporary reduction in roadway capacity and increased traffic delays	LS	PSM	LS	LS	LS	PSM
Regulations						
City and county encroachment permits.	X	X	X	X	X	X
SFPUC Construction Measures						
No. 5: Traffic	X	X	X	X	X	X
PEIR Mitigation Measures						
4.8-1a: Traffic Control Plan Measures	N/A	X	N/A	N/A	N/A	X
4.8-1b: Coordination of Individual Traffic Control Plans	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.8-2: Short-term traffic increases on roadways	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
City and county encroachment permits.	X	X	X	X	X	X
SFPUC Construction Measures						
No. 5: Traffic	X	X	X	X	X	X
PEIR Mitigation Measures						
4.8-1a: Traffic Control Plan Measures	X	X	X	X	X	X
Impact 4.8-3: Impaired access to adjacent roadways and land uses	LS	PSM	LS	LS	LS	LS
Regulations						
City and county encroachment permits.	X	X	X	X	X	X
SFPUC Construction Measures						
No. 5: Traffic	X	X	X	X	X	X
PEIR Mitigation Measures						
4.8-1a: Traffic Control Plan Measures	N/A	X	N/A	N/A	N/A	N/A
Impact 4.8-4: Temporary displacement of on-street parking	LS	LS	LS	LS	LS	LS
Regulations						
City and county encroachment permits.	X	X	X	X	X	X
SFPUC Construction Measures						
No. 5: Traffic	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
PEIR Mitigation Measures						
4.8-4: Accommodation of Displaced Public Parking Supply for Recreational Visitors	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.8-5: Increased traffic safety hazards during construction	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
City and county encroachment permits.	X	X	X	X	X	X
SFPUC Construction Measures						
No. 5: Traffic	X	X	X	X	X	X
PEIR Mitigation Measures						
4.8-1a: Traffic Control Plan Measures	X	X	X	X	X	X
Impact 4.8-6: Long-term traffic increases during facility operation	N/A	N/A	LS	N/A	LS	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
4.9 Air Quality						
Impact 4.9-1: Construction emissions of criteria pollutants	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X	X
PEIR Mitigation Measures						
4.9-1a: SJVAPCD Dust Control Measures	N/A	N/A	N/A	N/A	N/A	N/A
4.9-1b: SJVAPCD Exhaust Control Measures	N/A	N/A	N/A	N/A	N/A	N/A
4.9-1c: BAAQMD Dust Control Measures	X	X	X	X	X	X
4.9-1d: BAAQMD Exhaust Control Measures	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.9-2: Exposure to diesel particulate matter during construction	LS	PSM	LS	LS	PSM	LS
Regulations						
California Health and Safety Code, Section 2485 – Reduces emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.9-2a: Health Risk Screening or Use of Soot Filters	N/A	N/A	N/A	N/A	N/A	N/A
4.9-2b: Vacate SFPUC Land Managers' Residences in Sunol Valley	N/A	X	N/A	N/A	X	N/A
Impact 4.9-3: Exposure to emissions (possibly including asbestos) from tunneling	L/S	N/A	L/S	PSM	N/A	LS
Regulations						
OSHA standards for worker safety during tunneling	X	N/A	X	X	N/A	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.9-3: Tunnel Gas Odor Control	N/A	N/A	N/A	X	N/A	N/A
Impact 4.9-4: Air pollutant emissions during project operation	LS	LS	LS	LS	LS	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.9-5: Odors generated during project operation	N/A	N/A	LS	N/A	LS	N/A
Regulations						
BAAQMD Rule 1-301 – Prohibits the discharge of any contaminants that causes annoyance for a considerable number of people of normal sensitivity	X	X	X	X	X	X
BAAQMD Regulation 7 – Specifies odor limits for public exposure and identifies specific dilution levels that must be achieved as a function of odor emission strength	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.9-6: Secondary emissions at power plants	LS	LS	LS	LS	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.9-7: Conflict with implementation of applicable regional air quality plans addressing criteria air pollutants and state goals for reducing GHG emissions.	LS	LS	LS	LS	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
4.10 Noise and Vibration						
Impact 4.10-1: Disturbance from temporary construction-related noise increases	PSU	PSU	PSU	PSU	PSU	PSU
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 6: Noise	X	X	X	X	X	X
PEIR Mitigation Measures						
4.10-1a: Noise Controls	X	X	X	X	X	X
4.10-1b: Vacate SFPUC Caretaker's Residence at Tesla Portal	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.10-2: Temporary noise disturbance along construction haul routes	LS	LS	LS	PSM	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.10-2a: Limiting Hourly Truck Volumes	N/A	N/A	N/A	N/A	N/A	N/A
4.10-2b: Restricting Truck Operations	N/A	N/A	N/A	N/A	N/A	N/A
4.10-2c: Vacate SFPUC Land Manager's Residence	N/A	N/A	N/A	X	N/A	N/A
Impact 4.10-3: Disturbance due to construction-related vibration	LS	LS	PSU	PSM	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.10-3a: Vibration Controls to Prevent Cosmetic or Structural Damage	N/A	N/A	X	X	N/A	N/A
4.10-3b: Limit Vibration Levels at or Below Vibration Perception Threshold	N/A	N/A	X	N/A	N/A	N/A
4.10-3c: Limit Tunnel-Related Detonation to Daylight hours	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.10-4: Disturbance due to long-term noise increases	LS	N/A	LS	LS	LS	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 6: Noise	X	N/A	X	X	N/A	X
PEIR Mitigation Measures						
None required.						
4.11 Public Services and Utilities						
Impact 4.11-1: Potential temporary damage to or disruption of existing regional or local public utilities	PSM	PSM	PSM	PSM	LS	PSM
Regulations						
OSHA Construction Safety Orders	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
DHS separation standards	X	X	X	X	X	X
SFPUC Construction Measures						
No. 1: Neighborhood Notice	X	X	X	X	X	X
PEIR Mitigation Measures						
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X	X	N/A	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X	X	N/A	X
4.11-1c: Confirmation of Utility Line Information	X	X	X	X	N/A	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X	X	N/A	X
4.11-1e: Notify Local Fire Departments	X	X	X	X	N/A	X
4.11-1f: Emergency Response Plan	X	X	X	X	N/A	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X	X	N/A	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X	X	N/A	X
Impact 4.11-2: Temporary adverse effects on solid waste landfill capacity	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
California Integrated Waste Management Act of 1989	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.11-2: Waste Reduction Measures	X	X	X	X	X	X
Impact 4.11-3: Impacts related to compliance with statutes and regulations related to solid waste	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
California Integrated Waste Management Act of 1989	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.11-2: Waste Reduction Measures	X	X	X	X	X	X

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.11-4: Impacts related to the relocation of facilities	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 1: Neighborhood Notice	X	X	X	X	X	X
PEIR Mitigation Measures						
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X	X	X	X
4.11-1c: Confirmation of Utility Line Information	X	X	X	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X	X	X	X
4.11-1f: Emergency Response Plan	X	X	X	X	X	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X	X	X	X
4.12 Recreational Resources						
Impact 4.12-1: Temporary conflicts with established recreational uses during construction	LS	LS	N/A	PSM	N/A	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 1: Neighborhood Notice	X	X	N/A	X	N/A	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	N/A	X	N/A	N/A
No. 5: Traffic	X	X	N/A	X	N/A	N/A
No. 6: Noise	X	X	N/A	X	N/A	N/A
PEIR Mitigation Measures						
4.12-1: Coordination with Golf Course/Recreational Facility Managers	N/A	N/A	N/A	N/A	N/A	N/A
See Traffic Measures (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), and Noise Measures (4.10-1 through 4.10-3).	N/A	N/A	N/A	X	N/A	N/A

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.12-2: Conflicts with established recreational uses due to facility siting and project operation	N/A	N/A	N/A	N/A	N/A	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.12-2: Appropriate Siting of Proposed Facilities	N/A	N/A	N/A	N/A	N/A	N/A
4.13 Agricultural Resources						
Impact 4.13-1: Temporary conflicts with established agricultural resources	PSM	PSM	PSM	PSM	N/A	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 1: Neighborhood Notice	X	X	X	N/A	N/A	X
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	N/A	N/A	X
No. 5: Traffic	X	X	X	N/A	N/A	X
No. 6: Noise	X	X	X	N/A	N/A	X
PEIR Mitigation Measures						
4.13-1a: Supplemental Noticing and Soil Stockpiling	N/A	N/A	N/A	N/A	N/A	N/A
4.13-1b: Avoidance or Soil Stockpiling	X	X	X	X	N/A	X
Impact 4.13-2: Conversion of farmlands to nonagricultural uses	N/A	LS	PSM	N/A	PSM	N/A
Regulations						
California Land Conservation Act of 1965 (Williamson Act)	N/A	N/A	X	N/A	X	N/A
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.13-2: Siting Facilities to Avoid Prime Farmland	N/A	N/A	X	N/A	X	N/A

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
4.14 Hazards						
Impact 4.14-1: Potential to encounter hazardous materials in soil and groundwater	LS	LS	LS	LS	LS	LS
Regulations						
None applicable.						
SFPUC Construction Measures						
No. 4: Groundwater	X	X	N/A	X	N/A	X
No. 7: Hazardous Materials	X	X	X	X	X	X
PEIR Mitigation Measures						
4.14-1a: Site Health and Safety Plan	N/A	N/A	N/A	N/A	N/A	N/A
4.14-1b: Materials Disposal Plan	N/A	N/A	N/A	N/A	N/A	N/A
4.14-1c: Coordination with Property Owners and Regulatory Agencies	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.14-2: Exposure to naturally occurring asbestos	N/A	LS	N/A	N/A	N/A	N/A
Regulations						
Asbestos Airborne Toxic Control Measure	N/A	X	N/A	N/A	N/A	N/A
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.14-2: Health Risk Screening and Airborne Asbestos Monitoring Plan	N/A	N/A	N/A	N/A	N/A	N/A
Impact 4.14-3: Risk of fires during construction	LS	LS	LS	LS	LS	LS
Regulations						
Public Resources Code fire safety regulations	X	X	X	X	X	X
Watershed Management Plan Policies and Actions:						
Fir1: compliance with California Division of Forestry regulations	X	X	X	X	X	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Impact 4.14-4: Gassy conditions in tunnels	LS	N/A	LS	LS	N/A	LS
Regulations						
Tunnel Safety Orders	X	N/A	X	X	N/A	X
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.14-5: Exposure to hazardous building materials	N/A	PSM	N/A	PSM	N/A	N/A
Regulations						
California Code of Regulations, Title 8 – asbestos abatement	N/A	X	N/A	X	N/A	N/A
California Code of Regulations Title 17 – lead-based paint regulations	N/A	X	N/A	X	N/A	N/A
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
4.14-5: Hazardous Building Materials Surveys and Abatement	N/A	X	N/A	X	N/A	N/A
Impact 4.14-6: Accidental hazardous materials release from construction equipment	LS	LS	LS	LS	LS	LS
Regulations						
NPDES stormwater requirements	X	X	X	X	X	X
Watershed Management Plan Policies and Actions:						
Haz4: minimize leaks, drips, and spills of contaminants	X	X	X	X	X	X
Haz6: implement measures to reduce risk of hazardous spills	X	X	X	X	X	X
Haz7: develop spill response and containment measures	X	X	X	X	X	X
SFPUC Construction Measures						
No. 3: On-site Air and Water Quality Measures During Construction	X	X	X	X	X	X
PEIR Mitigation Measures						
None required.						
Impact 4.14-7: Increased use of hazardous materials during operation	N/A	N/A	LS	N/A	LS	N/A
Regulations						
Risk management regulations (HMBP)	N/A	N/A	X	N/A	X	N/A

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
Risk management regulations (RMP)	N/A	N/A	X	N/A	X	N/A
Aboveground storage tank regulations	N/A	N/A	N/A	N/A	X	N/A
Watershed Management Plan Policies and Actions:						
Haz1: development of hazardous chemical management procedures	N/A	N/A	X	N/A	X	N/A
Haz2: inventory and monitor above and below ground fuel storage tanks	N/A	N/A	X	N/A	X	N/A
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
Impact 4.14-8: Emission of use of hazardous materials within ¼ mile of a school	N/A	N/A	N/A	N/A	N/A	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
None required.						
4.15 Energy						
Impact 4.15-1: Construction-related energy use	PSM	PSM	PSM	PSM	PSM	PSM
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						
PEIR Mitigation Measures						
See Air Quality Measures (4.9-1b and 4.9-1d).	X	X	X	X	X	X
Impact 4.15-2: Long-term energy use during operation	PSM	N/A	PSM	N/A	PSM	N/A
Regulations						
None applicable.						
SFPUC Construction Measures						
None applicable.						

TABLE 6.4 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SUNOL VALLEY REGION PROJECTS (SV-1 through SV-6)

IMPACT	Alameda Creek Fishery Enhancement	Calaveras Dam Replacement	Additional 40-mgd Treated Water Supply	New Irvington Tunnel	SVWTP – Treated Water Reservoirs	San Antonio Backup Pipeline
	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6
PEIR Mitigation Measures						
4.15-2: Incorporation of Energy Efficiency Measures	X	N/A	X	N/A	X	N/A

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.5
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
4.3 Land Use and Visual Quality			
Impact 4.3-1: Temporary disruption or displacement of existing land uses during construction	PSM	PSM	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
No. 5: Traffic	X	X	X
No. 6: Noise	X	X	X
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
See Traffic Measure (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), and Noise Measures (4.10-1 through 4.10-3).	X	X	N/A
Impact 4.3-2: Permanent displacement or long-term disruption of existing land uses	PSU	LS	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.3-2: Facility Siting Studies	X	N/A	N/A
Impact 4.3-3: Temporary construction impacts on scenic vistas or visual character	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.3-4: Permanent adverse impacts on scenic vistas or visual character	PSM	PSM	N/A
Regulations			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.3-4a: Architectural Design	X	X	N/A
4.3-4b: Landscaping Plans	X	X	N/A
4.3-4c: Landscape Screens	X	X	N/A
4.3-4d: Minimize Tree Removal	X	X	N/A
Impact 4.3-5: New permanent sources of light glare	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.3-5: Reduce Lighting Effects	X	X	X
4.4 Geology, Soils, and Seismicity			
Impact 4.4-1: Slope instability during construction.	LS	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	N/A	N/A
PEIR Mitigation Measures			
4.4-1: Quantified Landslide Analysis	N/A	N/A	N/A
Impact 4.4-2: Erosion during construction.	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	X
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
PEIR Mitigation Measures			
None required.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.4-3: Substantial alteration of topography.	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-4: Squeezing ground and subsidence during tunneling	PSM	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.4-4: Subsidence Monitoring Program	X	N/A	N/A
Impact 4.4-5: Surface fault rupture.	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-6: Seismically induced groundshaking	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.4-7: Seismically induced ground failure, including liquefaction and settlement	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-8: Seismically induced landslides or other slope failures.	LS	N/A	N/A
Regulations			
SFPUC General Seismic Design Requirements	X	N/A	N/A
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	N/A	N/A
PEIR Mitigation Measures			
None required.			
Impact 4.4-9: Expansive or corrosive soils.	PSM	PSM	PSM
Regulations			
California Building Code	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
4.4-9: Characterize Extent of Expansive and Corrosive Soil	X	X	X
4.5 Surface Water Hydrology and Water Quality			
Impact 4.5-1: Degradation of water bodies as a result of erosion and sedimentation or a hazardous materials release during construction	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	X
Encroachment permitting requirements	X	N/A	N/A
SFPUC Construction Measures			
No. 3: On-sire Air and Water Quality Measures During Construction	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
None required.			
Impact 4.5-2: Depletion of groundwater resources	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None required.			
PEIR Mitigation Measures			
4.5-2: Site-Specific Groundwater Analysis and Identified Measures	N/A	N/A	N/A
Impact 4.5-3a: Degradation of water quality due to construction dewatering discharges	LS	LS	LS
Regulations			
NPDES discharge requirements	X	X	X
SFPUC Construction Measures			
No. 4: Groundwater	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.5-3b: Degradation of water quality due to construction-related discharges of treated water	LS	LS	LS
Regulations			
NPDES discharge requirements	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.5-4: Flooding and water quality impacts associated with impending or redirecting flood flows	PSM	PSM	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
4.5-4a: Flood Flow Protection Measures	X	X	N/A
4.5-4b: Site Specific Flooding Analysis and Identified Measures	N/A	N/A	N/A
Impact 4.5-5: Degradation of water quality and increased flows due to discharges to surface water during operation	LS	LS	N/A
Regulations			
NPDES discharge requirements	X	X	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.5-5: Stormwater Treatment and Groundwater Monitoring	N/A	N/A	N/A
Impact 4.5-6: Degradation of water quality as a result of alteration of drainage patterns or an increase in impervious surfaces	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	X
SFPUC Construction Measures			
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
4.5-6: Appropriate Source Control and Site Design Measures	N/A	N/A	N/A
4.6 Biological Resources			
Impact 4.6-1: Impact on wetlands and aquatic resources	PSM	PSM	PSM
Regulations			
Clean Water Act – Section 404	X	X	X
SFPUC Construction Measures			
No. 8: Biological Resources	X	X	X
PEIR Mitigation Measures			
4.6-1a: Wetlands Assessment	X	X	X
4.6-1b: Compensation for Wetlands and Other Biological Resources	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.6-2: Impact to sensitive habitats, common habitats, and heritage trees	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 8: Biological Resources – biological screening survey	X	X	X
PEIR Mitigation Measures			
4.6-2: Habitat Restoration/Tree Replacement	X	X	X
See Biological Resources Measure 4.6-1b.	X	X	X
Impact 4.6-3: Impact on key special-status species – direct mortality and/or habitat effects	PSM	PSM	PSM
Regulations			
Federal Endangered Species Act	X	X	X
California Endangered Species Act	X	X	X
Native Plant Protection Act	X	X	X
SFPUC Construction Measures			
No. 8: Biological Resources	X	X	X
PEIR Mitigation Measures			
4.6-3a: Protection Measures During Construction for Key Special-Status Species and Other Species of Concern	X	X	X
4.6-3b: Standard Mitigation Measures for Specific Plants and Animals	X	X	X
See Biological Resources Measreu 4.6-1b.	X	X	X
Impact 4.6-4: Water discharge effects on riparian and/or aquatic resources	PSM	PSM	LS
Regulations			
Waste Discharge Requirements	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.6-4: Pipeline and Water Treatment Plant Treated Water Discharge Restrictions	X	X	N/A
Impact 4.6-5: Conflict with adopted conservation plans or other approved biological resources plans	N/A	N/A	N/A
Regulations			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.7 Cultural Resources			
Impact 4.7-1: Impacts on paleontological resources	LS	LS	PSM
Regulations			
Paleontological Resources Preservation Act	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-1: Suspend Construction Work if Paleontological Resource is Identified	N/A	N/A	X
Impact 4.7-2: Impacts on archaeological resources	PSM	PSM	PSM
Regulations			
California Health and Safety Code	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-2a: Archaeological Testing, Monitoring, and Treatment of Human Remains	X	X	X
4.7-2b: Accidental Discovery Measures	X	X	X
Impact 4.7-3: Impacts on historical significance of a historic district or a contributor to a historic district	PSM	PSM	PSM
Regulations			
National Historic Preservation Act	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.7-3: Protection of Historic Districts	X	X	X
4.7-4a: Alternatives Identification and Resource Relocation	X	X	X
4.7-4b: Historical Resources Documentation	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	X	X
4.7-4d: Historical Resources Survey and Redesign	X	X	X
4.7-4e: Historic Resources Protection Plan	X	X	X
4.7-4f: Pre-construction Surveys and Vibration Monitoring	X	X	X
Impact 4.7-4: Impacts on the historical significance of individual facilities resulting from demolition or alteration	PSM	PSM	PSM
Regulations			
National Historic Preservation Act	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-4a: Alternatives Identification and Resource Relocation			
4.7-4b: Historical Resources Documentation	X	X	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	X	X
4.7-4d: Historic Resources Survey and Redesign	X	X	X
4.7-4e: Historic Resources Protection Plan	X	X	X
4.7-4f: Pre-construction Surveys and Vibration Monitoring	X	X	X
Impact 4.7-5: Impacts on adjacent historic architectural resources	PSM	PSM	PSM
Regulations			
National Historic Preservation Act	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-4a: Alternatives Identification and Resource Relocation	X	X	X
4.7-4b: Historical Resources Documentation	X	X	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	X	X
4.7-4d: Historical Resources Survey and Redesign	X	X	X
4.7-4e: Historic Resources Protection Plan	X	X	X
4.7-4f: Preconstruction Surveys and Vibration Monitoring	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
4.8 Traffic, Transportation, and Circulation			
Impact 4.8-1: Temporary reduction in roadway capacity and increased traffic delays	PSM	LS	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	N/A	X
4.8-1b: Coordination of Individual Traffic Control Plans	X	N/A	N/A
Impact 4.8-2: Short-term traffic increases on roadways	PSM	PSM	PSM
Regulations			
City and county encroachment permits, if applicable	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
4.8-1b: Coordination of Individual Traffic Control Plans	X	N/A	N/A
Impact 4.8-3: Impaired access to adjacent roadways and land uses	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
Impact 4.8-4: Temporary displacement of on-street parking	PSM	LS	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	N/A	X
4.8-4: Accommodation of Displaced Public Parking Supply for Recreational Visitors	N/A	N/A	N/A
Impact 4.8-5: Increased traffic safety hazards during construction	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
Impact 4.8-6: Long-term traffic increases during facility operation	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.9 Air Quality			
Impact 4.9-1: Construction emissions of criteria pollutants	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
PEIR Mitigation Measures			
4.9-1a: SJVAPCD Dust Control Measures	N/A	N/A	N/A
4.9-1b: SJVAPCD Exhaust Control Measures	N/A	N/A	N/A
4.9-1c: BAAQMD Dust Control Measures	X	X	X
4.9-1d: BAAQMD Exhaust Control Measures	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.9-2: Exposure to diesel particulate matter during construction	PSM	LS	LS
Regulations			
California Health and Safety Code, Section 2485 – Reduces emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.9-2a: Health Risk Screening or Use of Soot Filters	X	N/A	N/A
4.9-2b: Vacate SFPUC Land Managers' Residences in Sunol Valley	N/A	N/A	N/A
Impact 4.9-3: Exposure to emissions (possibly including asbestos) from tunneling	PSM	N/A	PSM
Regulations			
OSHA standards for worker safety during tunneling	X	N/A	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.9-3: Tunnel Gas Odor Control	X	N/A	X
Impact 4.9-4: Air pollutant emissions during project operations	LS	LS	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.9-5: Odors generated during project operation	N/A	N/A	N/A
Regulations			
BAAQMD Rule 1-301 – Prohibits the discharge of any contaminants that causes annoyance for a considerable number of people of normal sensitivity	X	X	X
BAAQMD Regulation 7 – Specifies odor limits for public exposure and identifies specific dilution levels that must be achieved as a function of odor emission strength	X	X	X
SFPUC Construction Measures			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
None required.			
Impact 4.9-6: Secondary emissions at power plants	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.9-7: Conflict with implementation of the applicable air quality plan	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.10 Noise and Vibration			
Impact 4.10-1: Disturbance from temporary construction-related noise increases	PSU	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 6: Noise	X	X	X
PEIR Mitigation Measures			
4.10-1a: Noise Controls	X	X	X
4.10-1b: Vacate SFPUC Caretaker's Residence at Tesla Portal	N/A	N/A	N/A
Impact 4.10-2: Temporary noise disturbance along construction haul routes	PSU	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
4.10-2a: Limiting Hourly Truck Volumes	X	X	X
4.10-2b: Restricting Truck Operations	X	X	X
4.10-2c: Vacate SFPUC Land Manager's Residence	N/A	N/A	N/A
Impact 4.10-3: Disturbance due to construction-related vibration	PSU	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.10-3a: Vibration Controls to Prevent Cosmetic or Structural Damage	X	X	X
4.10-3b: Limit Vibration Levels at or Below Vibration Perception Threshold	X	X	X
4.10-3c: Limit Tunnel-Related Detonation to Daylight Hours	X	N/A	N/A
Impact 4.10-4: Disturbance due to long-term noise increases	LS	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 6: Noise	X	N/A	N/A
PEIR Mitigation Measures			
None required.			
4.11 Public Services and Utilities			
Impact 4.11-1: Potential temporary damage to or disruption of existing regional or local public utilities	PSM	PSM	PSM
Regulations			
OSHA Construction Safety Orders	X	X	X
DHS separation standards	X	X	X
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
PEIR Mitigation Measures			
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
4.11-1c: Confirmation of Utility Line Information	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X
4.11-1f: Emergency Response Plan	X	X	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X
Impact 4.11-2: Temporary adverse effects on solid waste landfill capacity	PSM	PSM	PSM
Regulations			
California Integrated Waste Management Act of 1989	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.11-2: Waste Reduction Measures	X	X	X
Impact 4.11-3: Impacts related to compliance with statutes and regulations related to solid waste	PSM	PSM	PSM
Regulations			
California Integrated Waste Management Act of 1989	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.11-2: Waste Reduction Measures	X	X	X
Impact 4.11-4: Impacts related to the relocation of utilities	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
PEIR Mitigation Measures			
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X
4.11-1c: Confirmation of Utility Line Information	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
4.11-1f: Emergency Response Plan	X	X	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X
4.12 Recreational Resources			
Impact 4.12-1: Temporary conflicts with established recreational uses during construction	PSM	PSM	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	N/A
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	N/A
No. 5: Traffic	X	X	N/A
No. 6: Noise	X	X	N/A
PEIR Mitigation Measures			
4.12-1: Coordination with Golf Course/Recreational Facility Managers	X	X	N/A
See Traffic Measures (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), and Noise Measures (4.10-1 through 4.10-3).	X	X	N/A
Impact 4.12-2: Conflicts with established recreational uses due to facility siting and project operation	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.12-2: Appropriate Siting of Proposed Facilities	N/A	N/A	N/A
4.13 Agricultural Resources			
Impact 4.13-1: Temporary conflicts with established agricultural resources	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
4.13-1a: Supplemental Noticing and Soil Stockpiling	N/A	N/A	N/A
4.13-1b: Avoidance or Soil Stockpiling	N/A	N/A	N/A
Impact 4.13-2: Conversion of farmlands to nonagricultural uses	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.13-2: Siting Facilities to Avoid Prime Farmland	N/A	N/A	N/A
4.14 Hazards			
Impact 4.14-1: Potential to encounter hazardous materials in soil or groundwater	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 4: Groundwater	X	X	X
No. 7: Hazardous Materials	X	X	X
PEIR Mitigation Measures			
4.14-1a: Site Health and Safety Plan	X	X	X
4.14-1b: Materials Disposal Plan	X	X	X
4.14-1c: Coordination with Property Owners and Regulatory Agencies	X	N/A	N/A
Impact 4.14-2: Exposure to naturally occurring asbestos	PSM	N/A	N/A
Regulations			
Asbestos Airborne Toxic Control Measure	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.14-2: Health Risk Screening and Airborne Asbestos Monitoring Plan	X	N/A	N/A

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.14-3: Risk of fires during construction	LS	N/A	N/A
Regulations			
Public Resources Code fire safety regulations	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.14-4: Gassy conditions in tunnels.	LS	N/A	LS
Regulations			
Tunnel Safety Orders	X	N/A	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.14-5: Exposure to hazardous building materials.	PSM	N/A	N/A
Regulations			
California Code of Regulations, Title 8 – asbestos abatement	X	N/A	N/A
California Code of Regulations Title 17 – lead-based paint regulations	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.14-5: Hazardous Building Materials Surveys and Abatement	X	N/A	N/A
Impact 4.14-6: Accidental hazardous materials release from construction equipment.	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	X
SFPUC Construction Measures			
No. 3: On-site Air and Water Quality Measures During Construction	X	X	X
PEIR Mitigation Measures			
None required.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
Impact 4.14-7: Increased use of hazardous materials during operation	LS	LS	N/A
Regulations			
Risk management regulations (HMBP)	X	X	N/A
Risk management regulations (RMP)	N/A	N/A	N/A
Aboveground storage tank regulations	X	X	N/A
SFPUC Standard Measures Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.14-8: Emission or use of hazardous materials within ¼ mile of a school	LS	LS	N/A
Regulations			
Risk management regulations (HMBP)	X	X	N/A
Risk management regulations (RMP)	N/A	N/A	N/A
Aboveground storage tank regulations	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.15 Energy			
Impact 4.15-1: Construction-related energy use	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Standard Construction Measures			
None applicable.			
PEIR Mitigation Measures			
See Air Quality measures (4.9-1b and 4.9-1d).	X	X	X
Impact 4.15-2: Long-term energy use during operation	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Standard Construction Measures			
None applicable.			

TABLE 6.5 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF BAY DIVISION REGION PROJECTS (BD-1 through BD-3)

IMPACT	Bay Division Pipeline Reliability Upgrade BD-1	BDPL Nos. 3 and 4 Crossovers BD-2	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault BD-3
PEIR Mitigation Measures			
4.15-2: Incorporation of Energy Efficiency Measures	X	X	X

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.6
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
4.3 Land Use and Visual Quality					
Impact 4.3-1: Temporary disruption or displacement of existing land uses during construction	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	X	X	X	X	X
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X
No. 5: Traffic	X	X	X	X	X
No. 6: Noise	X	X	X	X	X
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.3-2: Permanent displacement or long-term disruption of existing land uses	N/A	PSU	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-2: Facility Siting Studies	N/A	X	N/A	N/A	N/A
Impact 4.3-3: Temporary construction impacts on scenic vistas or visual character	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
None required.					

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	**PN-2**	**PN-3**	**PN-4**	**PN-5**
Impact 4.3-4: Permanent adverse impacts on scenic vistas or visual character	LS	PSM	PSM	PSM	PSM
Regulations					
Watershed Management Plans and Actions		X		X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-4a: Architectural Design	N/A	X	X	X	X
4.3-4b: Landscaping Plans	N/A	X	X	X	X
4.3-4c: Landscape Screens	N/A	X	X	X	X
4.3-4d: Minimize Tree Removal	N/A	X	X	X	X
Impact 4.3-5: New permanent sources of light glare	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.3-5: Reduce Lighting Effects	X	X	X	X	X
4.4 Geology, Soils, and Seismicity					
Impact 4.4-1: Slope instability during construction	LS	LS	PSM	LS	PSM
Regulations					
Watershed Management Plan Policies and Actions:					
No. S5: avoid landslides and slopes greater than 30%	N/A	X	N/A	X	X
No. S6: conduct inspections	N/A	X	N/A	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
4.4-1: Quantified Landslide Analysis	N/A	N/A	X	N/A	X
Impact 4.4-2: Erosion during construction	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
SFPUC Construction Measures					
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-3: Substantial alteration of topography	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-4: Squeezing ground and subsidence during tunneling	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.4-4: Subsidence Monitoring Program	N/A	N/A	N/A	N/A	N/A
Impact 4.4-5: Surface fault rupture	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
Watershed Management Plan Policies and Actions:					
No. S4: avoid active fault zones and traces	N/A	X	N/A	N/A	N/A
No. S6: conduct inspections	N/A	X	N/A	N/A	N/A
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	N/A	X	N/A	N/A	N/A
PEIR Mitigation Measures					
None required.					

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.4-6: Seismically induced groundshaking	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-7: Seismically induced ground failure, including liquefaction and settlement	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required					
Impact 4.4-8: Seismically induced landslides or other slope failures	LS	LS	LS	LS	LS
Regulations					
SFPUC General Seismic Design Requirements	X	X	X	X	X
Watershed Management Plan Policies and Actions:					
No. S5: avoid landslides and slopes over 30%	N/A	N/A	N/A	N/A	X
No. S6: conduct inspections	N/A	N/A	N/A	N/A	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.4-9: Expansive or corrosive soils	PSM	PSM	PSM	PSM	PSM
Regulations					
California Building Code	X	X	X	X	X
SFPUC Construction Measures					
No. 2: Seismic and Geotechnical Studies	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
PEIR Mitigation Measures					
4.4-9: Characterize Extent of Expansive and Corrosive Soil	X	X	X	X	X
4.5 Surface Water Hydrology and Water Quality					
Impact 4.5-1: Degradation of water bodies as a result of erosion and sedimentation or a hazardous materials release during construction	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
Encroachment permitting requirements	N/A	N/A	N/A	X	X
Watershed Management Plans and Actions:					
Aqu1: locate outside of high water quality vulnerability zone if possible	X	X	N/A	X	X
Aqu5: rehabilitate shoreline area	N/A	N/A	N/A	X	X
Veg4: grading plan	X	X	N/A	X	X
Veg9: follow erosion control BMPs	X	X	N/A	X	X
Veg17: Minimize disturbance of serpentine bedrock	N/A	X	N/A	X	N/A
SFPUC Construction Measures					
No. 3: On-site and Water Quality Measures During Construction	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.5-2: Depletion of groundwater resources	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-2: Site-Specific Groundwater Analysis and Identified Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.5-3a: Degradation of water quality due to construction dewatering discharges	LS	LS	LS	LS	LS
Regulations					
NPDES discharge requirements	X	X	X	X	X
SFPUC Construction Measures					
No. 4: Groundwater	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
PEIR Mitigation Measures					
None required.					
Impact 4.5-3b: Degradation of water quality due to construction-related discharges of treated water	N/A	N/A	LS	N/A	LS
Regulations					
NPDES discharge requirements	N/A	N/A	X	N/A	X
Watershed Management Plans and Actions:					
Fis6: dechlorinate water before discharge	N/A	N/A	N/A	N/A	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.5-4: Flooding and water quality impacts associated with impeding or redirecting flood flows	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-4a: Flood Flow Protection Measures	N/A	N/A	N/A	N/A	N/A
4.5-4b: Site-Specific Flooding Analysis and Identified Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.5-5: Degradation of water quality and increased flows due to discharges to surface water during operation	N/A	LS	LS	N/A	LS
Regulations					
NPDES discharge requirements	N/A	X	X	N/A	X
Watershed Management Plans and Actions:					
Fis6: dechlorinate water before discharge	N/A	X	N/A	N/A	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.5-5: Stormwater Treatment and Groundwater Monitoring	N/A	N/A	N/A	N/A	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.5-6: Degradation of water quality as a result of alteration of drainage patterns or an increase in impervious surfaces	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
Watershed Management Plans and Actions:					
Sto1: stormwater drainage and collection	X	X	N/A	X	X
SFPUC Construction Measures					
No. 10: Project Site	X	X	X	X	X
PEIR Mitigation Measures					
4.5-6: Appropriate Source Control and Site Design Measures	N/A	N/A	N/A	N/A	N/A
4.6 Biological Resources					
Impact 4.6-1: Impact on wetlands and aquatic resources	LS	PSM	LS	PSM	PSM
Regulations					
Clean Water Act – Section 404	X	X	X	X	X
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-1a: Wetlands Assessment	N/A	X	N/A	X	X
4.6-1b: Compensation for Wetlands and Other Biological Resources	N/A	X	N/A	X	X
Impact 4.6-2: Impacts on sensitive habitats, common habitats, and heritage trees	PSM	PSM	LS	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-2: Habitat Restoration/Tree Replacement	N/A	X	N/A	X	X
See Biological Resources Measure 4.6-1b.	N/A	X	N/A	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.6-3: Impact on key special-status species – direct mortality and/or habitat effects	PSM	PSM	LS	PSM	PSM
Regulations					
Federal Endangered Species Act	X	X	X	X	X
California Endangered Species Act	X	X	X	X	X
Native Plant Protection Act	X	X	X	X	X
SFPUC Construction Measures					
No. 8: Biological Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.6-3a: Protection Measures During Construction for Key Special-Status Species and Other Species of Concern	X	X	N/A	X	X
4.6-3b: Standard Mitigation Measures for Specific Plants and Animals	X	X	N/A	X	X
See Biological Resources Measure 4.6-1b.	X	X	X	X	X
Impact 4.6-4: Water discharge effects on riparian and/or aquatic resources	LS	LS	LS	LS	LS
Regulations					
Waste Discharge Requirements	X	N/A	X	N/A	X
Watershed Management Plans and Actions:					
Fis 6: Identify and adopt alternative nontoxic management practices for the protection of aquatic resources	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.6-4: Treated Water Discharge Restrictions	N/A	N/A	N/A	N/A	N/A
Impact 4.6-5: Conflict with adopted conservation plans or other approved biological resources plans	LS	LS	N/A	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
See Biological Resources Measures 4.6-1a, 4.6-1b, 4.6-2, 4.6-3a, 4.6-3b.	X	X		X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
4.7 Cultural Resources					
Impact 4.7-1: Impacts on paleontological resources	PSM	LS	PSM	LS	PSM
Regulations					
Paleontological Resources Preservation Act	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.7-1: Suspend Construction Work if Paleontological Resource is Identified	X	N/A	X	N/A	X
Impact 4.7-2: Impacts on archaeological resources	PSM	PSM	PSM	PSM	PSM
Regulations					
California Health and Safety Code	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.7-2a: Archaeological Testing, Monitoring, and Treatment of Human Remains	X	X	X	X	X
4.7-2b: Accidental Discovery Measures	X	X	X	X	X
Impact 4.7-3: Impacts on historical significance of a historic district or a contributor to a historic district	N/A	PSU	N/A	PSM	N/A
Regulations					
National Historic Preservation Act	N/A	X	N/A	X	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.7-3: Protection of Historic Districts	N/A	X	N/A	X	N/A
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	N/A
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	N/A
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	N/A
4.7-4d: Historic Resources Survey and Redesign	N/A	X	N/A	X	N/A
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	N/A
4.7-4f: Pre-construction Surveys and Vibration Monitoring	N/A	X	N/A	X	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.7-4: Impacts on the historical significance of individual facilities resulting from demolition or alteration	N/A	PSU	N/A	PSU	N/A
Regulations					
National Historic Preservation Act	N/A	X	N/A	X	N/A
SFPUC Construction Measures					
No. 9: Cultural Resources	N/A	X	N/A	X	N/A
PEIR Mitigation Measures					
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	N/A
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	N/A
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	N/A
4.7-4d: Historic Resources Survey and Redesign	N/A	X	N/A	X	N/A
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	N/A
4.7-4f: Pre-construction Surveys and Vibration Monitoring	N/A	X	N/A	X	N/A
Impact 4.7-5: Impacts on adjacent historic architectural resources	LS	PSM	LS	PSM	PSM
Regulations					
National Historic Preservation Act	X	X	X	X	X
SFPUC Construction Measures					
No. 9: Cultural Resources	X	X	X	X	X
PEIR Mitigation Measures					
4.7-4a: Alternatives Identification and Resource Relocation	N/A	X	N/A	X	X
4.7-4b: Historical Resources Documentation	N/A	X	N/A	X	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	N/A	X	N/A	X	X
4.7-4d: Historical Resources Survey and Redesign	N/A	X	N/A	X	X
4.7-4e: Historic Resources Protection Plan	N/A	X	N/A	X	X
4.7-4f: Preconstruction Surveys and Vibration Monitoring	N/A	X	N/A	X	X
4.8 Traffic, Transportation, and Circulation					
Impact 4.8-1: Temporary reduction in roadway capacity and increased traffic delays	LS	PSM	LS	PSM	PSM
Regulations					
City and county encroachment permits, if applicable	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
PEIR Mitigation Measures					
4.8-1a: Traffic Control Plan Measures	N/A	X	N/A	X	X
4.8-1b: Coordination of Individual Traffic Control Plans	N/A	N/A	N/A	N/A	N/A
Impact 4.8-2: Short-term traffic increases on roadways	LS	PSM	PSM	PSM	PSM
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
4.8-1a: Traffic Control Plan Measures	N/A	X	X	X	X
4.8-1b: Coordination of Individual Traffic Control Plans	N/A	X	X	X	N/A
Impact 4.8-3: Impaired access to adjacent roadways and land uses during construction	LS	LS	LS	PSM	LS
Regulations					
City and county encroachment permits, if applicable	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
4.8-1a: Traffic Control Plan Measures	N/A	N/A	N/A	X	N/A
Impact 4.8-4: Temporary displacement of on-street parking	LS	LS	LS	PSM	PSM
Regulations					
City and county encroachment permits.	X	X	X	X	X
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
4.8-1a: Traffic Control Plan Measures	N/A	N/A	N/A	X	X
4.8-4: Accommodation of Displaced Public Parking Supply for Recreational Visitors	N/A	N/A	N/A	X	X
Impact 4.8-5: Increased traffic safety hazards during construction	PSM	PSM	PSM	PSM	PSM
Regulations					
City and county encroachment permits, if applicable	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
SFPUC Construction Measures					
No. 5: Traffic	X	X	X	X	X
PEIR Mitigation Measures					
4.8-1a: Traffic Control Plan Measures	X	X	X	X	X
Impact 4.8-6: Long-term traffic increases during facility operation	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
4.9 Air Quality					
Impact 4.9-1: Construction emissions of criteria pollutants	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X	X	X
PEIR Mitigation Measures					
4.9-1a: SJVAPCD Dust Control Measures	N/A	N/A	N/A	N/A	N/A
4.9-1b: SJVAPCD Exhaust Control Measures	N/A	N/A	N/A	N/A	N/A
4.9-1c: BAAQMD Dust Control Measures	N/A	N/A	N/A	N/A	N/A
4.9-1d: BAAQMD Exhaust Control Measures	N/A	N/A	N/A	N/A	N/A
Impact 4.9-2: Exposure to diesel particulate matter during construction	LS	LS	LS	LS	LS
Regulations					
California Health and Safety Code, Section 2485 – reduces emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.9-2a: Health Risk Screening or Use of Soot Filters	N/A	N/A	N/A	N/A	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
4.9-2b: Vacate SFPUC Land Managers' Residences in Sunol Valley	N/A	N/A	N/A	N/A	N/A
Impact 4.9-3: Exposure to emissions (possibly including asbestos) from tunneling	N/A	PSM	N/A	N/A	N/A
Regulations					
OSHA standards for worker safety during tunneling	N/A	N/A	N/A	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.9-3: Tunnel Gas Odor Control	N/A	X	N/A	N/A	N/A
Impact 4.9-4: Air pollutant emissions during project operation	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.9-5: Odors generated during project operation	N/A	N/A	LS	N/A	N/A
Regulations					
BAAQMD Rule 1-301 – prohibits the discharge of any contaminants that causes annoyance for a considerable number of people of normal sensitivity	X	X	X	X	X
BAAQMD Regulation 7 – specifies odor limits for public exposure and identifies specific dilution levels that must be achieved as a function of odor emission strength	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.9-6: Secondary emissions at power plants	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
PEIR Mitigation Measures					
None required.					
Impact 4.9-7: Conflict with implementation of the applicable air quality plan	LS	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
4.10 Noise and Vibration					
Impact 4.10-1: Disturbance from temporary construction-related noise increases	PSU	PSU	PSU	PSU	PSU
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 6: Noise	X	X	X	X	X
PEIR Mitigation Measures					
4.10-1a: Noise Controls	X	X	X	X	X
4.10-1b: Vacate SFPUC Caretaker's Residence at Tesla Portal	N/A	N/A	N/A	N/A	N/A
Impact 4.10-2: Temporary noise disturbance along construction haul routes	PSU	LS	PSU	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.10-2a: Limiting Hourly Truck Volumes	X	N/A	X	N/A	N/A
4.10-2b: Restricting Truck Operations	X	N/A	X	N/A	N/A
4.10-2c: Vacate SFPUC Land Manager's Residence	N/A	N/A	N/A	N/A	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.10-3: Disturbance due to construction-related vibration	PSU	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.10-3a: Vibration Controls to Prevent Cosmetic or Structural Damage	X	N/A	N/A	N/A	N/A
4.10-3b: Limit Vibration Levels at or Below Vibration Perception Threshold	X	N/A	N/A	N/A	N/A
4.10-3c: Limit Tunnel-Related Detonation to Daylight Hours	N/A	N/A	N/A	N/A	N/A
Impact 4.10-4: Disturbance due to long-term noise increases	LS	LS	LS	N/A	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 6: Noise	X	X	X	N/A	N/A
PEIR Mitigation Measures					
None required.					
4.11 Public Services and Utilities					
Impact 4.11-1: Potential temporary damage to or disruption of existing regional or local public utilities	LS	PSM	LS	PSM	LS
Regulations					
OSHA Construction Safety Orders	X	X	X	X	X
DHS separation standards	X	X	X	X	X
SFPUC Construction Measures					
No. 1: Neighborhood Notice	X	X	X	X	X
PEIR Mitigation Measures					
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	N/A	X	N/A	X	N/A
4.11-1b: Locate Utility Lines Prior to Excavation	N/A	X	N/A	X	N/A
4.11-1c: Confirmation of Utility Line Information	N/A	X	N/A	X	N/A
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	N/A	X	N/A	X	N/A
4.11-1e: Notify Local Fire Departments	N/A	X	N/A	X	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	**PN-2**	**PN-3**	**PN-4**	**PN-5**
4.11-1f: Emergency Response Plan	N/A	X	N/A	X	N/A
4.11-1g: Prompt Reconnection of Utilities	N/A	X	N/A	X	N/A
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	N/A	X	N/A	X	N/A
Impact 4.11-2: Temporary adverse effects on solid waste landfill capacity	PSM	PSM	PSM	PSM	PSM
Regulations					
California Integrated Waste Management Act of 1989	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.11-2: Waste Reduction Measures	X	X	X	X	X
Impact 4.11-3: Impacts related to compliance with statutes and regulations related to solid waste	PSM	PSM	PSM	PSM	PSM
Regulations					
California Integrated Waste Management Act of 1989	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.11-2: Waste Reduction Measures	X	X	X	X	X
Impact 4.11-4: Impacts related to the relocation of utilities	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	X	X	X	X	X
PEIR Mitigation Measures					
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X	X	X
4.11-1c: Confirmation of Utility Line Information	X	X	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X	X	X
4.11-1f: Emergency Response Plan	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
4.11-1g: Prompt Reconnection of Utilities	X	X	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X	X	X
4.12 Recreational Resources					
Impact 4.12-1: Temporary conflicts with established recreational uses during construction	N/A	PSM	N/A	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 1: Neighborhood Notice	N/A	X	N/A	X	X
No. 3: On-Site Air and Water Quality Measures during Construction	N/A	X	N/A	X	X
No. 5: Traffic	N/A	X	N/A	X	X
No. 6: Noise	N/A	X	N/A	X	X
PEIR Mitigation Measures					
4.12-1: Coordination with Golf Course/Recreational Facility Managers	N/A	X	N/A	N/A	N/A
See Traffic Measures (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), and Noise Measures (4.10-1 through 4.10-3).	N/A	X	N/A	N/A	N/A
Impact 4.12-2: Conflicts with established recreational uses due to facility siting and project operation	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.12-2: Appropriate Siting of Proposed Facilities	N/A	N/A	N/A	N/A	N/A
4.13 Agricultural Resources					
Impact 4.13-1: Temporary conflicts with established agricultural resources	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
PEIR Mitigation Measures					
4.13-1a: Supplemental Noticing and Soil Stockpiling	N/A	N/A	N/A	N/A	N/A
4.13-1b: Avoidance or Soil Stockpiling	N/A	N/A	N/A	N/A	N/A
Impact 4.13-2: Conversion of farmlands to nonagricultural uses	N/A	N/A	N/A	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.13-2: Siting Facilities to Avoid Prime Farmland	N/A	N/A	N/A	N/A	N/A
4.14 Hazards					
Impact 4.14-1: Potential to encounter hazardous materials in soil and groundwater	PSM	LS	LS	LS	LS
Regulations					
None applicable.					
SFPUC Construction Measures					
No. 4: Groundwater	X	X	X	X	X
No.7: Hazardous Materials	X	X	X	X	X
PEIR Mitigation Measures					
4.14-1a: Site Health and Safety Plan	X	N/A	N/A	N/A	N/A
4.14-1b: Materials Disposal Plan	X	N/A	N/A	N/A	N/A
4.14-1c: Coordination with Property Owners and Regulatory Agencies	N/A	N/A	N/A	N/A	N/A
Impact 4.14-2: Exposure to naturally occurring asbestos	N/A	LS	N/A	LS	N/A
Regulations					
Asbestos Airborne Toxic Control Measure	N/A	X	N/A	X	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.14-2: Health Risk Screening and Airborne Asbestos Monitoring Plan	N/A	N/A	N/A	N/A	N/A

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.14-3: Risk of fires during construction	LS	LS	N/A	LS	LS
Regulations					
Public Resources Code fire safety regulations	X	X	N/A	X	X
Watershed Management Plan Policies and Actions:					
Fir1: compliance with California Division of Forestry regulations	X	X	N/A	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-4: Gassy conditions in tunnels	N/A	LS	N/A	N/A	N/A
Regulations					
Tunnel Safety Orders	N/A	X	N/A	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-5: Exposure to hazardous building materials	PSM	PSM	PSM	PSM	PSM
Regulations					
California Code of Regulations, Title 8 – asbestos abatement	X	X	X	X	X
California Code of Regulations Title 17 – lead-based paint regulations	X	X	X	X	X
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.14-5: Hazardous Building Materials Surveys and Abatement	X	X	X	X	X

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	PN-2	PN-3	PN-4	PN-5
Impact 4.14-6: Accidental hazardous materials release from construction equipment	LS	LS	LS	LS	LS
Regulations					
NPDES stormwater requirements	X	X	X	X	X
Watershed Management Plan Policies and Actions:					
Haz5: minimize leaks, drips, and spills of contaminants	X	X	N/A	X	X
Haz8: implement measures to reduce risk of hazardous spills	X	X	N/A	X	X
Haz10: develop spill response and containment measures	X	X	N/A	X	X
SFPUC Construction Measures					
No. 3: On-site Air and Water Quality Measures During Construction	X	X	X	X	X
PEIR Mitigation Measures					
None required.					
Impact 4.14-7: Increased use of hazardous materials during operation	LS	N/A	LS	LS	N/A
Regulations					
Risk management regulations (HMBP)	X	N/A	X	X	N/A
Risk management regulations (RMP)	N/A	N/A	X	N/A	N/A
Aboveground storage tank regulations	N/A	N/A	X	X	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					
Impact 4.14-8: Emission or use of hazardous materials within ¼ mile of a school	LS	N/A	LS	N/A	N/A
Regulations					
Risk management regulations (HMBP)	X	N/A	X	N/A	N/A
Risk management regulations (RMP)	N/A	N/A	X	N/A	N/A
Aboveground storage tank regulations	N/A	N/A	N/A	N/A	N/A
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
None required.					

TABLE 6.6 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF PENINSULA REGION PROJECTS (PN-1 through PN-5)

IMPACT	Baden and San Pedro Valve Lots Improvements	Crystal Springs / San Andreas Transmission Upgrade	HTWTP Long-Term Improvements	Lower Crystal Springs Dam Improvements	Pulgas Balancing Reservoir Rehabilitation
	PN-1	**PN-2**	**PN-3**	**PN-4**	**PN-5**
4.15 Energy					
Impact 4.15-1: Construction-related energy use	PSM	PSM	PSM	PSM	PSM
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
See Air Quality measures (4.9-1b and 4.9-1d).	X	X	X	X	X
Impact 4.15-2: Long-term energy use during operation	N/A	PSM	PSM	N/A	N/A
Regulations					
None applicable.					
SFPUC Construction Measures					
None applicable.					
PEIR Mitigation Measures					
4.15-2: Incorporation of Energy Efficiency Measures	N/A	X	X	N/A	N/A

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.7
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
4.3 Land Use and Visual Quality			
Impact 4.3-1: Temporary disruption or displacement of existing land uses during construction	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
No. 5: Traffic	X	X	X
No. 6: Noise	X	X	X
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
See Traffic Measure (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), Noise Measures (4.10-1 through 4.10-3).	X	X	X
Impact 4.3-2: Permanent displacement or long-term disruption of existing land uses	N/A	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 6: Noise	N/A	X	X
No. 10: Project Site	N/A	X	X
PEIR Mitigation Measures			
4.3-2: Facility Siting Studies	N/A	X	X
Impact 4.3-3: Temporary construction impacts on scenic vistas or visual character	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.3-4: Permanent adverse impacts on scenic vistas or visual character	PSM	PSM	PSM
Regulations			
None applicable.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.3-4a: Architectural Design	X	X	X
4.3-4b: Landscaping Plans	X	X	X
4.3-4c: Landscape Screens	X	X	X
4.3-4d: Minimize Tree Removal	X	X	X
Impact 4.3-5: New permanent sources of light glare	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.3-5: Reduce Lighting Effects	X	X	X
4.4 Geology, Soils, and Seismicity			
Impact 4.4-1: Slope instability during construction	LS	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
4.4-1: Quantified Landslide Analysis	N/A	X	X
Impact 4.4-2: Erosion during construction	LS	LS	LS
Regulations			
NPDES stormwater regulations	X	X	N/A
San Francisco Public Works Code Article 4.1	X	X	X
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
PEIR Mitigation Measures			
None required.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.4-3: Substantial alteration of topography	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-4: Squeezing ground and subsidence during tunneling	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.4-4: Subsidence Monitoring Program	N/A	N/A	N/A
Impact 4.4-5: Surface fault rupture	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-6: Seismically induced groundshaking	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-7: Seismically induced ground failure, including liquefaction and settlement	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required			
Impact 4.4-8: Seismically induced landslides or other slope failures	LS	LS	LS
Regulations			
SFPUC General Seismic Design Requirements	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.4-9: Expansive or corrosive soils	PSM	PSM	PSM
Regulations			
California Building Code	X	X	X
SFPUC Construction Measures			
No. 2: Seismic and Geotechnical Studies	X	X	X
PEIR Mitigation Measures			
4.4-9: Characterize Extent of Expansive and Corrosive Soil	X	X	X
4.5 Surface Water Hydrology and Water Quality			
Impact 4.5-1: Degradation of water bodies as a result of erosion and sedimentation or a hazardous materials release during construction	LS	LS	LS
Regulations			
San Francisco Public Works Code Article 4.1	X	X	X
NPDES stormwater requirements	X	X	N/A
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures During Construction	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.5-2: Depletion of groundwater resources	LS	N/A	LS
Regulations			
None applicable.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.5-2: Site-Specific Groundwater Analysis and Identified Measures	N/A	N/A	N/A
Impact 4.5-3a: Degradation of water quality due to construction dewatering discharges	LS	N/A	LS
Regulations			
NPDES discharge requirements	X	N/A	N/A
San Francisco Public Works Code Article 4.1	X	N/A	X
SFPUC Construction Measures			
No. 4: Groundwater	X	N/A	X
PEIR Mitigation Measures			
None required.			
Impact 4.5-3b: Degradation of water quality due to construction-related discharges of treated water	LS	N/A	N/A
Regulations			
NPDES discharge requirements	X	N/A	N/A
San Francisco Public Works Code Article 4.1	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.5-4: Flooding and water quality impacts associated with impeding or redirecting flood flows	N/A	PSM	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.5-4a: Flood Flow Protection Measures	N/A	X	N/A
4.5-4b: Site Specific Flooding Analysis and Identified Measures	N/A	N/A	N/A

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.5-5: Degradation of water quality and increased flows due to discharges to surface water during operation	N/A	PSM	LS
Regulations			
San Francisco Public Works Code Article 4.1	N/A	N/A	X
NPDES discharge regulations	N/A	X	X
RWQCB General Water Reuse Order	N/A	N/A	X
CCSF Reclaimed Water Ordinance	N/A	N/A	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.5-5: Stormwater Treatment and Groundwater Monitoring	N/A	X	N/A
Impact 4.5-6: Degradation of water quality as a result of alteration of drainage patterns or an increase in impervious surfaces	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	N/A
San Francisco Public Works Code Article 4.1	X	X	X
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures During Construction	X	X	X
No. 10: Project Site	X	X	X
PEIR Mitigation Measures			
4.5-6: Appropriate Source Control and Site Design Measures	N/A	N/A	N/A
4.6 Biological Resources			
Impact 4.6-1: Impact on wetlands and aquatic resources	PSM	PSM	PSM
Regulations			
Clean Water Act – Section 404	X	X	X
SFPUC Construction Measures			
No. 8: Biological Resources	X	X	X
PEIR Mitigation Measures			
4.6-1a: Wetlands Assessment	X	X	X
4.6-1b: Compensation for Wetlands and Other Biological Resources	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.6-2: Impact to sensitive habitats, common habitats, and heritage trees	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 8: Biological Resources	X	X	X
PEIR Mitigation Measures			
4.6-2: Habitat Restoration/Tree Replacement	X	X	X
See Biological Resources Measure 4.6-1b.	X	X	X
Impact 4.6-3: Impact on key special-status species – direct mortality and/or habitat effects	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 8: Biological Resources	X	X	X
PEIR Mitigation Measures			
4.6-3a: Protection Measures During Construction for Key Special-Status Species and Other Species of Concern	N/A	N/A	N/A
4.6-3b: Standard Mitigation Measures for Specific Plants and Animals	N/A	N/A	N/A
Impact 4.6-4: Water discharge effects on riparian and/or aquatic resources	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.6-4: Treated Water Discharge Restrictions	N/A	N/A	N/A
Impact 4.6-5: Conflict with adopted conservation plans or other approved biological resources plans	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
4.7 Cultural Resources			
Impact 4.7-1: Impacts on paleontological resources	PSM	PSM	PSM
Regulations			
Paleontological Resources Preservation Act	X	X	X
SFPUC Construction Measures			
No. 9 Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-1: Suspend Construction Work if Paleontological Resource is Identified	X	X	X
Impact 4.7-2: Impacts on archaeological resources	PSM	PSM	PSM
Regulations			
California Health and Safety Code	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-2a: Archaeological Testing, Monitoring, and Treatment of Human Remains	X	X	X
4.7-2b: Accidental Discovery Measures	X	X	X
Impact 4.7-3: Impacts on historical significance of a historic district or a contributor to a historic district	PSM	N/A	N/A
Regulations			
National Historic Preservation Act	X	N/A	N/A
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.7-3: Protection of Historic Districts	X	N/A	N/A
4.7-4a: Alternatives Identification and Resource Relocation	X	N/A	N/A
4.7-4b: Historical Resources Documentation	X	N/A	N/A
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	N/A	N/A
4.7-4d: Historic Resources Survey and Redesign	X	N/A	N/A
4.7-4e: Historic Resources Protection Plan	X	N/A	N/A
4.7-4f: Pre-construction Surveys and Vibration Monitoring	X	N/A	N/A

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.7-4: Impacts on the historical significance of individual facilities resulting from demolition or alteration	PSM	N/A	LS
Regulations			
National Historic Preservation Act	X	N/A	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	N/A	X
PEIR Mitigation Measures			
4.7-4a: Alternatives Identification and Resource Relocation	X	N/A	N/A
4.7-4b: Historical Resources Documentation	X	N/A	N/A
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	N/A	N/A
4.7-4d: Historic Resources Survey and Redesign	X	N/A	N/A
4.7-4e: Historic Resources Protection Plan	X	N/A	N/A
4.7-4f: Pre-construction Surveys and Vibration Monitoring	X	N/A	N/A
Impact 4.7-5: Impacts on adjacent historic architectural resources	PSM	LS	PSM
Regulations			
National Historic Preservation Act	X	X	X
SFPUC Construction Measures			
No. 9: Cultural Resources	X	X	X
PEIR Mitigation Measures			
4.7-4a: Alternatives Identification and Resource Relocation	X	N/A	X
4.7-4b: Historical Resources Documentation	X	N/A	X
4.7-4c: Secretary of the Interior's Standards for Treatment of Historic Properties	X	N/A	X
4.7-4d: Historical Resources Survey and Redesign	X	N/A	X
4.7-4e: Historic Resources Protection Plan	X	N/A	X
4.7-4f: Preconstruction Surveys and Vibration Monitoring	X	N/A	X
4.8 Traffic, Transportation, and Circulation			
Impact 4.8-1: Temporary reduction in roadway capacity and increased traffic delays	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
4.8-1b: Coordination of Individual Traffic Control Plans	X	N/A	N/A
Impact 4.8-2: Short-term increases on roadways	PSM	LS	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	N/A	X
4.8-1b: Coordination of Individual Traffic Control Plans	X	N/A	X
Impact 4.8-3: Impaired access to adjacent roadways and land uses	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
Impact 4.8-4: Temporary displacement of on-street parking	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
4.8-4: Accommodation of Displaced Public Parking Supply for Recreational Visitors	N/A	N/A	N/A
Impact 4.8-5: Increased traffic safety hazards during construction	PSM	PSM	PSM
Regulations			
City and county encroachment permits.	X	X	X
SFPUC Construction Measures			
No. 5: Traffic	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
PEIR Mitigation Measures			
4.8-1a: Traffic Control Plan Measures	X	X	X
Impact 4.8-6: Long-term traffic increases during facility operation	N/A	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.9 Air Quality			
Impact 4.9-1: Construction emissions of criteria pollutants	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
PEIR Mitigation Measures			
4.9-1a: SJVAPCD Dust Control Measures	N/A	N/A	N/A
4.9-1b: SJVAPCD Exhaust Control Measures	N/A	N/A	N/A
4.9-1c: BAAQMD Dust Control Measures	N/A	N/A	N/A
4.9-1d: BAAQMD Exhaust Control Measures	N/A	N/A	N/A
Impact 4.9-2: Exposure to diesel particulate matter during construction	LS	LS	LS
Regulations			
California Health and Safety Code, Section 2485 – Reduces emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.9-2a: Health Risk Screening or Use of Soot Filters	N/A	N/A	N/A
4.9-2b: Vacate SFPUC Land Managers' Residences in Sunol Valley	N/A	N/A	N/A

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.9-3: Exposure to emissions (possibly including asbestos) from tunneling	PSM	PSM	PSM
Regulations			
OSHA standards for worker safety during tunneling	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.9-3: Tunnel Gas Odor Control	X	X	X
Impact 4.9-4: Air pollutant emissions during project operation	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.9-5: Odors generated during project operation	LS	LS	LS
Regulations			
BAAQMD Rule 1-301 – Prohibits the discharge of any contaminants that causes annoyance for a considerable number of people of normal sensitivity	X	X	X
BAAQMD Regulation 7 – Specifies odor limits for public exposure and identifies specific dilution levels that must be achieved as a function of odor emission strength	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.9-6: Secondary emissions at power plants	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Impact 4.9-7: Conflict with implementation of the applicable air quality plan	LS	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.10 Noise and Vibration			
Impact 4.10-1: Disturbance from temporary construction-related noise increases	PSU	PSU	PSU
Regulations			
City and County of San Francisco Noise Ordinance (Police Code, Article 29) time and noise limits for construction activities.	X	X	X
SFPUC Construction Measures			
No. 6: Noise	X	X	X
PEIR Mitigation Measures			
4.10-1a: Noise Controls	X	X	X
4.10-1b: Vacate SFPUC Caretaker's Residence at Tesla Portal	N/A	N/A	N/A
Impact 4.10-2: Temporary noise disturbance along construction haul routes	PSU	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.10-2a: Limiting Hourly Truck Volumes	X	X	X
4.10-2b: Restricting Truck Operations	X	X	X
4.10-2c: Vacate SFPUC Land Manager's Residence	N/A	N/A	N/A
Impact 4.10-3: Disturbance due to construction-related vibration	PSU	PSU	PSU
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
PEIR Mitigation Measures			
4.10-3a: Vibration Controls to Prevent Cosmetic or Structural Damage	X	X	X
4.10-3b: Limit Vibration Levels at or Below Vibration Perception Threshold	X	X	X
4.10-3b: Limit Tunnel-Related Detonation to Daylight Hours	N/A	N/A	N/A
Impact 4.10-4: Disturbance due to long-term noise increases	N/A	LS	LS
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 6: Noise	N/A	X	X
PEIR Mitigation Measures			
None required.			
4.11 Public Services and Utilities			
Impact 4.11-1: Potential temporary damage to or disruption of existing regional or local public utilities	PSM	PSM	PSM
Regulations			
OSHA Construction Safety Orders	X	X	X
DHS separation standards	X	X	X
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
PEIR Mitigation Measures			
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X
4.11-1c: Confirmation of Utility Line Information	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X
4.11-1f: Emergency Response Plan	X	X	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X
Impact 4.11-2: Temporary adverse effects on solid waste landfill capacity	PSM	PSM	PSM
Regulations			
California Integrated Waste Management Act of 1989	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.11-2: Waste Reduction Measures	X	X	X
Impact 4.11-3: Impacts related to compliance with statutes and regulations related to solid waste	PSM	PSM	PSM
Regulations			
California Integrated Waste Management Act of 1989	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.11-2: Waste Reduction Measures	X	X	X
Impact 4.11-4: Impacts related to the relocation of utilities	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X
PEIR Mitigation Measures			
4.11-1a: Notify Neighbors of Potential Utility Service Disruption	X	X	X
4.11-1b: Locate Utility Lines Prior to Excavation	X	X	X
4.11-1c: Confirmation of Utility Line Information	X	X	X
4.11-1d: Safeguard Employees from Potential Accidents Related to Underground Utilities	X	X	X
4.11-1e: Notify Local Fire Departments	X	X	X
4.11-1f: Emergency Response Plan	X	X	X
4.11-1g: Prompt Reconnection of Utilities	X	X	X
4.11-1h: Coordinate Final Construction Plans with Affected Utilities	X	X	X
4.12 Recreational Resources			
Impact 4.12-1: Temporary conflicts with established recreational uses during construction	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 1: Neighborhood Notice	X	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
No. 3: On-Site Air and Water Quality Measures during Construction	X	X	X
No. 5: Traffic	X	X	X
No. 6: Noise	X	X	X
PEIR Mitigation Measures			
4.12-1: Coordination with Golf Course/Recreational Facility Managers	X	X	X
See Traffic Measures (4.8-1), Air Quality Measures (4.9-1 and 4.9-2), and Noise Measures (4.10-1 through 4.10-3).	X	X	X
Impact 4.12-2: Conflicts with established recreational uses due to facility siting and project operation	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.12-2: Appropriate Siting of Proposed Facilities	X	X	X
See Land Use and Visual Quality Measures (4.3-4).	X	X	X
4.13 Agricultural Resources			
Impact 4.13-1: Temporary conflicts with established agricultural resources	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.13-1a: Supplemental Noticing and Soil Stockpiling	N/A	N/A	N/A
4.13-1b: Avoidance or Soil Stockpiling	N/A	N/A	N/A
Impact 4.13-2: Conversion of farmlands to nonagricultural uses	N/A	N/A	N/A
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.13-2: Siting Facilities to Avoid Prime Farmland	N/A	N/A	N/A

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
4.14 Hazards			
Impact 4.14-1: Potential to encounter hazardous materials in soil and groundwater	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
No. 4: Groundwater	X	N/A	X
No. 7: Hazardous Materials	X	X	X
PEIR Mitigation Measures			
4.14-1a: Site Health and Safety Plan	X	X	X
4.14-1b: Materials Disposal Plan	X	X	X
4.14-1c: Coordination with Property Owners and Regulatory Agencies	N/A	X	N/A
Impact 4.14-2: Exposure to naturally occurring asbestos	LS	LS	LS
Regulations			
Asbestos Airborne Toxic Control Measure	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.14-2: Health Risk Screening and Airborne Asbestos Monitoring Plan	N/A	N/A	N/A
Impact 4.14-3: Risk of fires during construction	N/A	LS	LS
Regulations			
Public Resources Code fire safety regulations	N/A	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.14-4: Gassy conditions in tunnels	LS	LS	LS
Regulations			
Tunnel Safety Orders	X	X	X
SFPUC Construction Measures			
None applicable.			

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
PEIR Mitigation Measures			
None required.			
Impact 4.14-5: Exposure to hazardous building materials	PSM	PSM	PSM
Regulations			
California Code of Regulations, Title 8 – asbestos abatement	X	X	X
California Code of Regulations Title 17 – lead-based paint regulations	X	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.14-5: Hazardous Building Materials Surveys and Abatement	X	X	X
Impact 4.14-6: Accidental hazardous materials release from construction equipment	LS	LS	LS
Regulations			
NPDES stormwater requirements	X	X	N/A
San Francisco Public Works Code Article 4.1	X	X	X
SFPUC Construction Measures			
No. 3: On-Site Air and Water Quality Measures During Construction	X	X	X
PEIR Mitigation Measures			
None required.			
Impact 4.14-7: Increased use of hazardous materials during operation	N/A	LS	LS
Regulations			
Risk management regulations (HMBP)	N/A	X	X
Risk management regulations (RMP)	N/A	X	X
Aboveground storage tank regulations	N/A	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
Impact 4.14-8: Emission or use of hazardous materials within ¼ mile of a school	N/A	LS	LS
Regulations			
Risk management regulations (HMBP)	N/A	X	X
Risk management regulations (RMP)	N/A	X	X

TABLE 6.7 (continued)
IMPACT AND MITIGATION SUMMARY FOR FACILITY CONSTRUCTION AND OPERATION OF SAN FRANCISCO REGION PROJECTS (SF-1 through SF-3)

IMPACT	San Andreas Pipeline No. 3 Installation	Groundwater Projects	Recycled Water Projects
	SF-1	SF-2	SF-3
Aboveground storage tank regulations	N/A	X	X
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
None required.			
4.15 Energy			
Impact 4.15-1: Construction-related energy use	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
See Air Quality Measures (4.9-1b and 4.9-1d).	X	X	X
Impact 4.15-2: Long-term energy use during operation	PSM	PSM	PSM
Regulations			
None applicable.			
SFPUC Construction Measures			
None applicable.			
PEIR Mitigation Measures			
4.15-2: Incorporation of Energy Efficiency Measures	X	X	X

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.8
SUMMARY OF COLLECTIVE IMPACTS AND MITIGATION RELATED TO WSIP FACILITIES

IMPACT	Multi-Regional Collective Impact	San Joaquin Region	Sunol Valley Region	Bay Division Region	Peninsula Region	San Francisco Region
Land Use and Visual Quality						
Impact 4.16-1a: Collective temporary and permanent impacts on existing land uses in the vicinity of proposed facility sites	N/A	N/A	N/A	PSU	LSM	N/A
Collective PEIR Mitigation Measures						
4.16-1a: Construction Coordination at Irvington Portal	N/A	N/A	N/A	X	N/A	N/A
Impact 4.16-1b: Collective temporary and permanent impacts on the visual character of the surrounding area	N/A	LSM	LS	LSM	LSM	LSM
Collective PEIR Mitigation Measures						
None required.						
Geology, Soils, and Seismicity						
Impact 4.16-2: Collective exposure of people or structures to geologic and seismic hazards	B	N/A	N/A	N/A	N/A	N/A
Collective PEIR Mitigation Measures						
None required.						
Hydrology and Water Quality						
Impact 4.16-3: Collective WSIP impacts related to the degradation of surface waters and flooding hazards	LSM	LSM	LSM	LSM	LSM	LSM
Collective PEIR Mitigation Measures						
None required.						
Biological Resources						
Impact 4.16-4: Collective loss of sensitive biological resources	PSM	PSM	PSU	PSM	PSU	N/A
Collective PEIR Mitigation Measures						
4.16-4a: Bioregional Habitat Restoration Measures	X	N/A	N/A	N/A	N/A	N/A
4.16-4b: Coordination of Construction Staging and Access	N/A	X	X	X	X	N/A
Cultural Resources						
Impact 4.16-5: Collective impacts related to archaeological, paleontological, and historical resources	LSM	LSM	PSU	LSM	PSU	N/A
Collective PEIR Mitigation Measures						
No additional mitigation measures identified.						
Traffic, Transportation, and Circulation						
Impact 4.16-6: Collective traffic increases on local and regional roads	PSU	PSM	PSM	PSM	PSM	PSM
Collective PEIR Mitigation Measures						
Measure 4.16-6a: SFPUC WSIP Projects Construction Coordinator	N/A	N/A	X	X	X	X

TABLE 6.8 (continued)
SUMMARY OF COLLECTIVE IMPACTS AND MITIGATION RELATED TO WSIP FACILITIES

IMPACT	Multi-Regional Collective Impact	San Joaquin Region	Sunol Valley Region	Bay Division Region	Peninsula Region	San Francisco Region
Measure 4.16-6b: Combined San Joaquin Traffic Control Plan	X	N/A	N/A	N/A	N/A	N/A
Measure 4.16-6c: Combined Sunol Valley Traffic Control Plan	N/A	X	N/A	N/A	N/A	N/A
Air Quality						
Impact 4.16-7: Collective increases in construction and/or operational emissions in the region	PSU	PSM	PSM	LSM	LS	LS
Collective PEIR Mitigation Measures						
Measure 4.16-7a: Dust and Exhaust Control Measures for All WSIP Projects	X	N/A	N/A	N/A	N/A	N/A
Measure 4.16-7b: Health Risk Screening or Use of Soot Filters for All Projects in the San Joaquin and Sunol Valley Regions	N/A	X	X	N/A	N/A	N/A
Measure 4.16-7c: Vacate SFPUC Land Managers' Residences for All Projects in the Sunol Valley Region	N/A	N/A	X	N/A	N/A	N/A
Noise and Vibration						
Impact 4.16-8: Collective increases in construction-related and operational noise	N/A	PSU	PSM	PSU	PSU	PSU
Collective PEIR Mitigation Measures						
Measure 4.16-8a: Limiting Hourly Truck Volumes and Restricting Truck Operations on Haul Routes for Multiple WSIP Projects	N/A	X	N/A	X	X	X
Measure 4.16-8b: Vacate Land Manager's Residence for All Projects in Sunol Valley Region	N/A	N/A	X	N/A	N/A	N/A
Public Services and Utilities						
Impact 4.16-9: Collective impacts on utilities and landfill capacity	LSM	N/A	N/A	N/A	N/A	N/A
Collective PEIR Mitigation Measures						
None required.						
Recreational Resources						
Impact 4.16-10: Collective effects on recreational resources during construction	LS	LSM	LSM	LSM	LSM	LSM
Collective PEIR Mitigation Measures						
None required.						
Agricultural Resources						
Impact 4.16-11: Collective conversion of farmland to nonagricultural uses	LSM	N/A	N/A	N/A	N/A	N/A
Collective PEIR Mitigation Measures						
None required.						

TABLE 6.8 (continued)
SUMMARY OF COLLECTIVE IMPACTS AND MITIGATION RELATED TO WSIP FACILITIES

IMPACT	Multi-Regional Collective Impact	San Joaquin Region	Sunol Valley Region	Bay Division Region	Peninsula Region	San Francisco Region
Hazards						
Impact 4.16-12: Collective effects related to hazardous conditions and exposure to or release of hazardous materials	LS	LSM	LSM	LSM	LSM	LSM
Collective PEIR Mitigation Measures						
None required.						
Energy Resources						
Impact 4.16-13: Collective increases in the use of nonrenewable energy resources	LSM	LSM	LSM	LSM	LSM	LSM
Collective PEIR Mitigation Measures						
None required.						

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable
B = Beneficial Impact

TABLE 6.9
SUMMARY OF CUMULATIVE IMPACTS AND MITIGATION RELATED TO WSIP FACILITIES

IMPACT	Significance Determination
Land Use and Visual Quality	
Impact 4.17-1: Cumulative disruption of established communities, changes in existing land use patterns, and impacts on the existing visual character	LS
Cumulative PEIR Mitigation Measures	
None required	
Geology, Soils, and Seismicity	
Impact 4.17-2: Cumulative exposure of people or structures to geologic and seismic hazards	B/LS
Cumulative PEIR Mitigation Measures	
None required.	
Hydrology and Water Quality	
Impact 4.17-3: Cumulative impacts related to the degradation of water quality, alteration of drainage patterns, increased surface runoff, and flooding hazards	LS
Cumulative PEIR Mitigation Measures	
None required.	
Biological Resources	
Impact 4.17-4: Cumulative loss of sensitive biological resources	LS
Cumulative PEIR Mitigation Measures	
None required.	
Cultural Resources	
Impact 4.17-5: Cumulative increase in impacts on archaeological, paleontological, and historical resources	PSU
Cumulative PEIR Mitigation Measures	
No additional mitigation measures identified.	
Traffic, Transportation, and Circulation	
Impact 4.17-6: Cumulative traffic increases on local and regional roads	PSU
Cumulative PEIR Mitigation Measures	
Measure 4.17-6: SFPUC WSIP Projects Construction Coordinator – Other Agencies	X
Air Quality	
Impact 4.17-7: Cumulative increases in construction and/or operational emissions in the region	PSU
Cumulative PEIR Mitigation Measures	
No additional mitigation measures identified.	

TABLE 6.9 (continued)
SUMMARY OF CUMULATIVE IMPACTS AND MITIGATION RELATED TO WSIP FACILITIES

IMPACT	Significance Determination
Noise and Vibration	
Impact 4.17-8: Cumulative increases in construction-related and operational noise	PSU
Cumulative PEIR Mitigation Measures	
Measure 4.17-8: Coordination of Truck Traffic on Local Streets	X
Public Services and Utilities	
Impact 4.17-9: Cumulative impacts related to disruption of utility service or relocation of utilities	LS
Cumulative PEIR Mitigation Measures	
None required.	
Recreational Resources	
Impact 4.17-10: Cumulative effects on recreational resources during construction	LS
Cumulative PEIR Mitigation Measures	
None required.	
Agricultural Resources	
Impact 4.17-11: Cumulative conversion of farmland to nonagricultural uses	LS
Cumulative PEIR Mitigation Measures	
None required.	
Hazards	
Impact 4.17-12: Cumulative effects related to hazardous conditions and exposure to or release of hazardous materials	LS
Cumulative PEIR Mitigation Measures	
None required.	
Energy Resources	
Impact 4.17-13: Cumulative increases in the use of nonrenewable energy resources	LS
Cumulative PEIR Mitigation Measures	
None required.	

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable
B = Beneficial Impact

TABLE 6.10
IMPACT AND MITIGATION SUMMARY FOR THE TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
5.3.1 Stream Flow and Reservoir Water Levels		
Impact 5.3.1-1: Effects on flow along the Tuolumne River below O'Shaughnessy Dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.1-2: Effects on flow along Cherry Creek below Cherry Dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.1-3: Effects on flow along Eleanor Creek below Eleanor Dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.1-4: Effects on flow along the Tuolumne River below La Grange Dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.1-5: Effects on flow along the San Joaquin River and the Sacramento-San Joaquin Delta	LS	
PEIR Mitigation Measures		
None required.		
5.3.2 Geomorphology		
Impact 5.3.2-1: Effects on sediment transport and channel characteristics between O'Shaughnessy Dam and Don Pedro Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.2-2: Effects on sediment transport and channel characteristics below La Grange Dam	LS	
PEIR Mitigation Measures		
None required.		
5.3.3 Surface Water Quality		
Impact 5.3.3-1: Effects on water quality in Hetch Hetchy Reservoir and along the Tuolumne River below O'Shaughnessy Dam	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.10 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.3.3-2: Effects on water quality in Don Pedro Reservoir and along the Tuolumne River below La Grange Dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.3-3: Effects on water quality along the San Joaquin River and the Sacramento-San Joaquin Delta	LS	
PEIR Mitigation Measures		
None required.		
5.3.4 Surface Water Supplies		
Impact 5.3.4-1: Effects on Tuolumne River, San Joaquin River, and Stanislaus River water users	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.4-2: Effects on Delta water users	LS	
PEIR Mitigation Measures		
None required.		
5.3.5 Groundwater		
Impact 5.3.5-1: Alteration of stream flows along the Tuolumne River, which could affect local groundwater recharge and groundwater levels	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.5-2: Alteration of stream flows along the Tuolumne River, which could affect local groundwater quality	LS	
PEIR Mitigation Measures		
None required.		
5.3.6 Fisheries		
Impact 5.3.6-1: Effects on fishery resources in Hetch Hetchy Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.6-2: Effects on fishery resources along the Tuolumne River between Hetch Hetchy Reservoir and Don Pedro Reservoir	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.10 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.3.6-3: Effects on fishery resources in Don Pedro Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.6-4: Effects on fishery resources along the Tuolumne River below La Grange Dam	PSM	5.3.6-4a or 5.3.6-4b
PEIR Mitigation Measures		
5.3.6-4a: Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water		X
5.3.6-4b: Fishery Habitat Enhancement		X
Impact 5.3.6-5: Effects on fishery resources along the San Joaquin River	LS	
PEIR Mitigation Measures		
None required.		
5.3.7 Terrestrial Biological Resources		
Impact 5.3.7-1: Impacts on riparian habitat and related biological resources in Hetch Hetchy Reservoir and along the bedrock channel portions of the Tuolumne River from O'Shaughnessy Dam to Don Pedro Reservoir		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.7-2: Impacts on alluvial features that support meadow and riparian habitat along the Tuolumne River from O'Shaughnessy Dam to Don Pedro Reservoir		
Sensitive Habitats	PSM	5.3.7-2
Key Special-status Species	PSM	5.3.7-2
Other Species of Concern	PSM	5.3.7-2
Common Habitats and Species	PSM	5.3.7-2
PEIR Mitigation Measures		
5.3.7-2: Controlled Releases to Recharge Groundwater in Streamside Meadows and Other Alluvial Deposits		X
Impact 5.3.7-3: Impacts on biological resources in Lake Eleanor and along Eleanor Creek		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	

TABLE 6.10 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.7-4: Impacts on biological resources in Lake Lloyd and along Cherry Creek		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.7-5: Impacts on biological resources in Don Pedro Reservoir		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.7-6: Impacts on biological resources along the Tuolumne River below La Grange Dam		
Sensitive Habitats	PSM	5.3.6-4a or 5.3.7-6
Key Special-status Species	PSM	5.3.6-4a or 5.3.7-6
Other Species of Concern	PSM	5.3.6-4a or 5.3.7-6
Common Habitats and Species	PSM	5.3.6-4a or 5.3.7-6
PEIR Mitigation Measures		
5.3.6-4a: Avoidance of Flow Changes by Reducing Demand for Don Pedro Reservoir Water		X
5.3.7-6: Lower Tuolumne River Riparian Habitat Enhancement		X
Impact 5.3.7-7: Conflicts with the provisions of adopted conservation plans or other approved biological resources plans for the Tuolumne Wild and Scenic River	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.10 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE TUOLUMNE RIVER SYSTEM AND DOWNSTREAM WATER BODIES RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
5.3.8 Recreational and Visual Resources		
Impact 5.3.8-1: Effects on reservoir recreation due to changes in water system operations	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.8-2: Effects on river recreation due to changes in water system operations	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.3.8-3: Effects on the aesthetic values of the Tuolumne Wild and Scenic River	LS	
PEIR Mitigation Measures		
None required.		
5.3.9 Energy Resources		
Impact 5.3.9-1: Effects on hydropower generation at facilities along the Tuolumne River	B	
PEIR Mitigation Measures		
None required.		

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.11
IMPACT AND MITIGATION SUMMARY FOR ALAMEDA CREEK WATERSHED STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
5.4.1 Stream Flow and Reservoir Water Levels		
Impact 5.4.1-1: Effects on flow along Calaveras Creek below Calaveras Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.1-2: Effects on flow along Alameda Creek below the diversion dam	SU	5.4.1-2
PEIR Mitigation Measures		
5.4.1-2 – Diversion Tunnel Operation		X
Impact 5.4.1-3: Effects in San Antonio Reservoir and along San Antonio Creek	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.1-4: Effects on flow along Alameda Creek below the confluence of San Antonio Creek	LS	
PEIR Mitigation Measures		
None required.		
5.4.2 Geomorphology		
Impact 5.4.2-1: Effects on channel formation and sediment transport along Calaveras Creek	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.2-2: Effects on channel formation and sediment transport along Alameda Creek downstream of the diversion dam	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.2-3: Effects on channel formation and sediment transport along San Antonio Creek downstream of San Antonio Reservoir	LS	
PEIR Mitigation Measures		
None required.		
5.4.3 Surface Water Quality		
Impact 5.4.3-1: Effects on water quality in Calaveras Reservoir	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.11 (continued)
IMPACT AND MITIGATION SUMMARY FOR ALAMEDA CREEK WATERSHED STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.4.3-2: Effects on water quality in San Antonio Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.3-3: Effects on water quality along Calaveras, San Antonio, and Alameda Creeks	LS	
PEIR Mitigation Measures		
None required.		
5.4.4 Groundwater		
Impact 5.4.4-1: Changes in groundwater levels, flows, quality, and supplies	LS	
PEIR Mitigation Measures		
None required.		
5.4.5 Fisheries		
Impact 5.4.5-1: Effects on fishery resources in Calaveras Reservoir	B	
PEIR Mitigation Measures		
None required.		
Impact 5.4.5-2: Effects on fishery resources along Calaveras Creek below Calaveras Dam and along Alameda Creek below confluence with Calaveras Creek	B	
PEIR Mitigation Measures		
None required.		
Impact 5.4.5-3: Effects on fishery resources along Alameda Creek downstream of Alameda Creek Diversion Dam	PSM	5.4.5-3a or 5.4.5-3b
PEIR Mitigation Measures		
5.4.5-3a: Minimum Flows for Resident Trout on Alameda Creek		X
5.4.5-3b: Alameda Diversion Dam Restrictions or Fish Screens		X
Impact 5.4.5-4: Effects on fishery resources in San Antonio Reservoir	B	
PEIR Mitigation Measures		
None required.		
Impact 5.4.5-5: Effects on fishery resources along San Antonio Creek below San Antonio Reservoir	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.11 (continued)
IMPACT AND MITIGATION SUMMARY FOR ALAMEDA CREEK WATERSHED STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.4.5-6: Effects on fishery resources along Alameda Creek below confluence with San Antonio Creek	LS	
PEIR Mitigation Measures		
None required.		
5.4.6 Terrestrial Biological Resources		
Impact 5.4.6-1: Effects on riparian habitat and related biological resources in Calaveras Reservoir		
Sensitive Habitats	PSM	5.4.6-1
Key Special-status Species	PSM	5.4.6-1
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
5.4.6-1: Compensation for Impacts on Terrestrial Biological Resources		X
Impact 5.4.6-2: Effects on riparian habitat and related biological resources along Alameda Creek, from below the diversion dam to the confluence with Calaveras Creek		
Sensitive Habitats	LS	
Key Special-status Species	PSM	5.4.1-2 and 5.4.5-3a
Other Species of Concern	LS	
Common Habitats and Species	N/A	
PEIR Mitigation Measures		
5.4.1-2: Diversion Tunnel Operation		X
5.4.5-3a: Minimum Flows for Resident Trout on Alameda Creek		X
Impact 5.4.6-3: Effects on riparian habitat and related biological resources along Calaveras Creek, from Calaveras Reservoir to the confluence with Alameda Creek		
Sensitive Habitats	LS	
Key Special-status Species	PSM	5.4.6-3
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
5.4.6-3: Operational Procedures for Calaveras Dam Releases		X

TABLE 6.11 (continued)
IMPACT AND MITIGATION SUMMARY FOR ALAMEDA CREEK WATERSHED STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.4.6-4: Effects on riparian habitat and related biological resources along Alameda Creek, from the confluence with Calaveras Creek to the confluence with San Antonio Creek		
Sensitive Habitats	LS	
Key Special-status Species	PSM	5.4.6-3 and 5.4.5-3a
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
5.4.6-3: Operational Procedures for Calaveras Dam Releases		X
5.4.5-3a: Minimum Flows for Resident Trout on Alameda Creek		X
Impact 5.4.6-5: Effects on riparian habitat and related biological resources in San Antonio Reservoir		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.6-6: Effects on riparian habitat and related biological resources along San Antonio Creek between Turner Dam and the confluence with Alameda Creek		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	N/A	
PEIR Mitigation Measures		
None required.		
Impact 5.4.6-7: Effects on riparian habitat and related biological resources along Alameda Creek below the confluence with San Antonio Creek		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	N/A	
PEIR Mitigation Measures		
None required.		

TABLE 6.11 (continued)
IMPACT AND MITIGATION SUMMARY FOR ALAMEDA CREEK WATERSHED STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.4.6-8: Conflicts with the provisions of adopted conservation plans or other approved biological resource plans	LS	
PEIR Mitigation Measures		
None required.		
5.4.7 Recreational and Visual Resources		
Impact 5.4.7-1: Effects on recreational facilities and/or activities	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.4.7-2: Visual effects on scenic resources or visual character of the water bodies	LS	
PEIR Mitigation Measures		
None required.		

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.12
IMPACT AND MITIGATION SUMMARY FOR THE SAN FRANCISCO PENINSULA STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
5.5.1 Stream Flow and Reservoir Water Levels		
Impact 5.5.1-1: Effects on flow along San Mateo Creek	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.1-2: Effects on flow along Pilarcitos Creek	LS	
PEIR Mitigation Measures		
None required.		
5.5.2 Geomorphology		
Impact 5.5.2-1: Changes in sediment transport and channel morphology in the Peninsula watershed	LS	
PEIR Mitigation Measures		
None required.		
5.5.3 Surface Water Quality		
Impact 5.5.3-1: Effects on water quality in Crystal Springs Reservoir, San Andreas Reservoir, and San Mateo Creek	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.3-2: Effects on water quality in Pilarcitos Reservoir and along Pilarcitos Creek	PSM	5.5.3-2
PEIR Mitigation Measures		
5.5.3-2: Revised Operations Plan for Pilarcitos Watershed Facilities		X
5.5.4 Groundwater		
Impact 5.5.4-1: Alteration of stream flows along Pilarcitos Creek, which could affect groundwater levels and water quality	LS	
PEIR Mitigation Measures		
None required.		
5.5.5 Fisheries		
Impact 5.5.5-1: Effects on fishery resources in Crystal Springs Reservoir (Upper and Lower)	PSU	5.5.5-1
PEIR Mitigation Measures		
5.5.5-1: Create New Spawning Habitat Above Crystal Springs Reservoir		X

TABLE 6.12 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE SAN FRANCISCO PENINSULA STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.5.5-2: Effects on fishery resources in San Andreas Reservoir	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.5-3: Effects on fishery resources along San Mateo Creek	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.5-4: Effects on fishery resources in Pilarcitos Reservoir	PSM	5.5.3-2
PEIR Mitigation Measures		
5.5.3-2: Revised Operations Plan for Pilarcitos Watershed Facilities		X
Impact 5.5.5-5: Effects on fishery resources along Pilarcitos Creek below Pilarcitos Reservoir	PSM	5.5.3-2
PEIR Mitigation Measures		
5.5.3-2: Revised Operations Plan for Pilarcitos Watershed Facilities		X
5.5.6 Terrestrial Biological Resources		
Impact 5.5.6-1: Impacts on biological resources in Upper and Lower Crystal Springs Reservoirs:		
Sensitive Habitats	PSM	5.5.6-1a and 5.5.6-1b
Key Special-status Species	PSM	5.5.6-1a, 5.5.6-1b, and 5.5.6-1c
Other Species of Concern	PSM	5.5.6-1a and 5.5.6-1b
Common Habitats and Species	PSM	5.5.6-1a and 5.5.6-1b
PEIR Mitigation Measures		
5.5.6-1a: Adaptive Management of Freshwater Marsh and Wetlands at Upper and Lower Crystal Springs Reservoirs		X
5.5.6-1b: Compensation for Impacts on Terrestrial Biological Resources		X
5.5.6-1c: Compensation for Serpentine Seep-Related Special-Status Plants		X
Impact 5.5.6-2: Impacts on biological resources in San Andreas Reservoir		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	

TABLE 6.12 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE SAN FRANCISCO PENINSULA STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
PEIR Mitigation Measures		
None required.		
Impact 5.5.6-3: Impacts on biological resources along San Mateo Creek below Lower Crystal Springs Dam		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.6-4: Impacts on biological resources in Pilarcitos Reservoir		
Sensitive Habitats	LS	
Key Special-status Species	PSM	5.5.3-2
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
5.5.3-2: Revised Operations Plan for Pilarcitos Watershed Facilities		X
Impact 5.5.6-5: Impacts on biological resources along Pilarcitos Creek below Pilarcitos Reservoir		
Sensitive Habitats	PSM	5.5.3-2
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
5.5.3-2: Revised Operations Plan for Pilarcitos Watershed Facilities		X
Impact 5.5.6-6: Impacts on biological resources along Pilarcitos Creek below Stone Dam		
Sensitive Habitats	LS	
Key Special-status Species	LS	
Other Species of Concern	LS	
Common Habitats and Species	LS	
PEIR Mitigation Measures		
None required.		

TABLE 6.12 (continued)
IMPACT AND MITIGATION SUMMARY FOR THE SAN FRANCISCO PENINSULA STREAMS AND RESERVOIRS RELATED TO WATER SUPPLY AND SYSTEM OPERATIONS

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.5.6-7: Conflicts with the provisions of adopted conservation plans or other approved biological resource plans	LS	
PEIR Mitigation Measures		
None required.		
5.5.7 Recreational and Visual Resources		
Impact 5.5.7-1: Effects on recreational facilities and/or activities	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.5.7-2: Visual effects on scenic resources or the visual character of water bodies	LS	
PEIR Mitigation Measures		
None required.		

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PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.13
IMPACT AND MITIGATION SUMMARY FOR WESTSIDE GROUNDWATER BASIN RESOURCES

IMPACT	Significance Determination	Mitigation Measure Required
Impact 5.6-1: Basin overdraft due to pumping from the Westside Groundwater Basin		
North Westside Groundwater Basin	PSM	5.6-1
South Westside Groundwater Basin	LS	
PEIR Mitigation Measures		
5.6-1: Groundwater Monitoring to Determine Basin Safe Yield		X
Impact 5.6-2: Changes in water levels in Lake Merced and other surface water features, including Pine Lake, due to decreased groundwater levels in the Westside Groundwater Basin		
North Westside Groundwater Basin	PSM	5.6-1, 5.6-2
South Westside Groundwater Basin	N/A	
PEIR Mitigation Measures		
5.6-1: Groundwater Monitoring to Determine Basin Safe Yield		X
5.6-2: Implementation of a Lake Level Management Plan		X
Impact 5.6-3: Seawater intrusion due to decreased groundwater levels in the Westside Groundwater Basin		
North Westside Groundwater Basin	PSM	5.6-1
South Westside Groundwater Basin	LS	
PEIR Mitigation Measures		
5.6-1: Groundwater Monitoring to Determine Basin Safe Yield		X
Impact 5.6-4: Land subsidence due to deceased groundwater levels in the Westside Groundwater Basin if the historic low water levels are exceeded		
North Westside Groundwater Basin	LS	
South Westside Groundwater Basin	LS	
PEIR Mitigation Measures		
None required.		
Impact 5.6-5: Contamination of drinking water due to groundwater pumping in the Westside Groundwater Basin		
North Westside Groundwater Basin	PSM	5.6-5
South Westside Groundwater Basin	PSM	5.6-5
PEIR Mitigation Measures		
5.6-5: Drinking Water Source Assessments for Groundwater Wells		X
Impact 5.6-6: Drinking water contaminants above maximum contaminant levels and adverse effects of adding treated groundwater to the distribution system		
North Westside Groundwater Basin	LS	
South Westside Groundwater Basin	LS	

TABLE 6.13 (continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR WESTSIDE GROUNDWATER BASIN RESOURCES

IMPACT	Significance Determination	Mitigation Measure Required
PEIR Mitigation Measures		
None required.		

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.14
SUMMARY OF CUMULATIVE IMPACTS AND MITIGATION RELATED TO WSIP WATER SUPPLY AND SYSTEM OPERATIONS ON THE TUOLUMNE RIVER, ALAMEDA CREEK, AND PENINSULA WATERSHEDS

IMPACT	Hydrology	Geomorphology	Surface Water Quality	Groundwater	Fisheries	Terrestrial Biology	Recreation / Visual Quality
5.7.2 Cumulative Effects on the Tuolumne River System and Downstream Water Bodies							
Impact 5.7.2-1: Cumulative impacts on the Tuolumne River from Hetch Hetchy Reservoir to Don Pedro Reservoir	LS	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							
Impact 5.7.2-2: Cumulative impacts on the Tuolumne River from Don Pedro Reservoir to the San Joaquin River	LS	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							
Impact 5.7-2-3: Cumulative impacts on the San Joaquin River, Stanislaus River, and Delta	LS	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							
5.7.3 Cumulative Effects on Alameda Creek Watershed							
Impact 5.7.3-1: Cumulative effects on the Alameda Creek watershed	N/A	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							
5.7.4 Cumulative Effects on Peninsula Watershed							
Impact 5.7.4-1: Cumulative effects on the San Mateo Creek watershed	LS	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							

TABLE 6.14 (continued)
SUMMARY OF CUMULATIVE IMPACTS AND MITIGATION MEASURES RELATED TO WSIP WATER SUPPLY AND SYSTEM OPERATIONS ON THE TUOLUMNE RIVER, ALAMEDA CREEK, AND PENINSULA WATERSHEDS

IMPACT	Hydrology	Geomorphology	Surface Water Quality	Groundwater	Fisheries	Terrestrial Biology	Recreation / Visual Quality
Impact 5.7.4-2: Cumulative effects on the Pilarcitos Creek watershed	LS	LS	LS	LS	LS	LS	LS
Cumulative PEIR Mitigation Measures							
None required.							

LS = Less than Significant impact, no mitigation required
PSM= Potentially Significant impact, can be mitigated to less than significant
PSU = Potentially Significant Unavoidable impact
X = Applicable
N/A = Not Applicable

TABLE 6.15
SUMMARY OF CUMULATIVE IMPACTS AND MITIGATION RELATED TO WSIP WATER SUPPLY AND SYSTEM OPERATIONS FOR WESTSIDE GROUNDWATER BASIN

IMPACT	Significance Determination
Impact 5.7.5-1: Cumulative impacts on the North Westside Groundwater Basin	LS
Cumulative PEIR Mitigation Measures	
None required.	
Impact 5.7.5-1: Cumulative impacts on the South Westside Groundwater Basin	LS
Cumulative PEIR Mitigation Measures	
None required.	

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