ATTACHMENT 4-A
Mitigation for Chapter 4 Impacts

Introduction

Chapter 6, Mitigation Measures, presents the SFPUC construction measures and all mitigations measured identified to address significant impacts of the WSIP discussion in all impact sections of this PEIR. This attachment is an excerpt from Chapter 6 that presents the SFPUC construction measures and all mitigation measures for the PSM and PSU 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.

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.

Mitigation Measures to Minimize Facilities Impacts

Plans and Policies (Section 4.2)

None applicable.

Land Use and Visual Resources (Section 4.3)

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.

Geology, Soils and Seismicity (Section 4.4)

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.

Surface Water Hydrology and Water Quality (Section 4.5)

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.

Biological Resources (Section 4.6)

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[1] 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

[1] 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.

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.

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.

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

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

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

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

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

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 (1993), 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	
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

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;
- 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.[2] This might include

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

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.

Cultural Resources (Section 4.7)

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 archeological 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.

Archeological Testing Program. The archeological consultant shall prepare and submit to the ERO for review and approval an archeological testing plan (ATP). The archeological testing program shall be conducted in accordance with the approved ATP. The ATP shall identify the property types of the expected archeological 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 archeological testing program will be to

determine to the extent possible the presence or absence of any expected archeological resources and to identify and to preliminarily evaluate the integrity and significance of the resource.

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

Archeological Monitoring Program. The archeological consultant shall prepare and submit to the ERO for review and approval an archeological monitoring plan (AMP). The archeological 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 archeologically 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 archeological resource;

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

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

- If an intact archeological deposit is encountered, all soils-disturbing activities within the area specified in the AMP of the deposit shall cease. The archeological 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 archeological deposit. The archeological consultant shall make a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, and present the findings of this assessment to the ERO.

Whether or not significant archeological resources are encountered, the archeological 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.

Archeological Data Recovery Program. The archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). The archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP prior to preparation of a draft ADRP. The archeological 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 archeological 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 archeological 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 archeological data recovery program.

- *Security Measures*. Recommended security measures to protect the archeological 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 archeological 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 Archeological Resources Report. The archeological consultant shall submit a Draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological 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 archeological resource may be present within the project site, the project sponsor shall retain the services of a qualified archeological consultant. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological 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 archeological resource; an archaeological monitoring program; or an archeological testing program. If an archeological monitoring program or archeological 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 archeological resource is at risk from vandalism, looting, or other damaging actions.

The project archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describing the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological 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.

Traffic, Transportation, and Circulation (Section 4.8)

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.

Air Quality (Section 4.9)

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 PM10 Prohibitions) and Regulation IX (Mobile and Indirect Sources, Rule 9510, where applicable) control measures would mitigate PM10 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 PM10 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 Extended 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 separate 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.

Noise and Vibration (Section 4.10)

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).

Public Services and Utilities (Section 4.11)

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.

Recreational Resources (Section 4.12)

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.

Agricultural Resources (Section 4.13)

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.

Hazards (Section 4.14)

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.

Energy Resources (Section 4.15)

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.